

GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS

World Heritage Site Nomination



Volume 1: Nomination Dossier



Department
for Culture
Media & Sport



The
Gibraltar Museum



HM Government
of Gibraltar

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THE CHIEF MINISTER



I am honoured and delighted, as Chief Minister of Gibraltar, to have this opportunity of giving the full support and backing of Her Majesty's Government of Gibraltar to the nomination of the *Gibraltar Neanderthal Caves & Environments* site for inscription on the UNESCO World Heritage List.

We strongly believe that our site is of exceptional significance. The full realisation of its outstanding universal value has become clear from the remarkable research carried out over the past 25 years in partnership with over 40 international institutions. In this time the caves have revealed, and continue to reveal, their secrets. The site has made a major contribution to our understanding of the Neanderthals, in particular their capabilities and lifestyle, and it is remarkable that so many species of plants and animals which were known to the Neanderthals still survive in this site today. The site is truly a natural laboratory in which visitors can vividly and directly experience and understand the world of the Neanderthals as well as that of the modern humans who came later.

Her Majesty's Government of Gibraltar is fully committed to protecting and enhancing the quality of the natural and cultural environment, for the benefit of our community and the international community as a whole. During my term in office the Gibraltar Nature Reserve's boundaries were expanded significantly and most of the nominated property or its buffer zone is part of the Nature Reserve. At 28 hectares our site may appear modest in area but with its protective buffer zone it encompasses 40% of the land mass of Gibraltar. This is the strongest signal of our will to protect our cultural and natural assets. In spite of its proximity to a high density of population - 30,000 inhabitants and 12 million visitors per year to a territory of 6.5 square kilometres - the property's topography and abrupt relief, along with the protection we have given it, guarantee its long term survival. In fact, we do not see the large numbers of visitors coming each year as a hindrance but instead as a special window of opportunity to, under careful stewardship, promote our site and its values as well as UNESCO's ideals.

World Heritage Sites are undoubtedly places of exceptional significance to all humanity and they transcend national boundaries. Our support and funding of the nomination is the clearest indication of our pledge to this project and it also reflects our commitment to the aspirations of UNESCO in all aspects of sustainable development. I am convinced that our nomination offers many opportunities, among which will be a major contribution towards improving the balance of the World Heritage List. Representing a time when the concept of nationhood was long in the future, it will importantly allow us to reflect on the common and shared values of all the peoples that have lived on this planet and help towards a better understanding of the beauty of humanity's cultural diversity.

Understanding Gorhams is understanding the touchstone of humanity at its dawn. The world needs to protect this heritage site for current and future generations of humans to understand.

Fabian Picardo QC MP
Chief Minister

Acknowledgements

This nomination has been produced by the Gibraltar Museum on behalf of HM Government of Gibraltar, and the Gibraltar Neanderthal Caves and Environments World Heritage Steering Group.

Further copies of this Nomination may be obtained from:

The Gibraltar Museum
18-20 Bomb House Lane
Gibraltar

Tel. + 350 200 72489
Fax. + 350 200 79158

E-mail: clive.finlayson@gibmuseum.gi

<http://www.gibmuseum.gi>

The World Heritage Bid has been led by the Gibraltar Museum. Other organisations and departments on the World Heritage Steering Group are: the Office of the Deputy Chief Minister, the Department of the Environment, the Town Planning Department, Technical Services Department, Gibraltar Tourist Board, University of Gibraltar, Gibraltar Nature Conservancy Council, the Gibraltar Botanic Gardens, Gibraltar Heritage Trust, Gibraltar Ornithological and Natural History Society, English Heritage representing HM Government UK Department for Culture, Media and Sport, and HM Government UK Ministry of Defence.

Members of the International Research and Conservation Committee comprise the Doñana Biological Station, World Heritage Site, Spain; the University of Haifa and Mount Carmel World Heritage Site, Israel; University of Louvain, Belgium; University of Tarragona and Atapuerca World Heritage Site, Spain; and the University of York, United Kingdom.

In addition to stakeholders mentioned above, the preparation of the bid has benefited from advice from ICOMOS-UK and the UK National Commission from UNESCO.

Table of Contents

Executive Summary	10
1. Identification of the property	14
1.a Country: United Kingdom	14
1.b State, province or region: Gibraltar	14
1.c Name of property: Gibraltar Neanderthal caves and environments	14
1.d Geographical coordinates: 36° 07' 21.61" N; 05° 20' 31.42" W	14
1.e Maps and plans showing boundaries of the nominated property and buffer zone	14
1.f Area of nominated property and proposed buffer zone	14
2. Description	17
2.a Description of property	17
2.b History and development	110
3. Justification for inscription	126
3.1.a. Brief synthesis	126
3.1.b. Criteria under which inscription is proposed	133
3.1.c. Statement of integrity	135
3.1.d. Statement of authenticity	138
3.1.e. Protection and management requirements	140
3.2. Comparative analysis	142
3.2.a. Human Evolution sites currently on the World Heritage List	142
3.2.b. ICOMOS 1997 Study on potential fossil hominid sites for inscription on the World Heritage List	143
3.2.c. UNESCO Human Evolution: Adaptations, Dispersals and Social Developments (HEADS). World Heritage Thematic Programme	145
3.2.d. Comparison of ICOMOS 1997 and HEADS 2009 Studies	147
3.2.e. Multi-level Analyses	147
3.3. Proposed statement of outstanding universal value	155
4. State of conservation and factors affecting the property	158
4.a Present state of conservation	158
4.b Factors affecting the property	164

5. Protection and management	178
5.a Ownership	178
5.b Protective designation	178
5.c Means of implementing protective measures	183
5.d Existing plans related to municipality and region in which the proposed property is located (e.g., regional or local plan, conservation plan, tourism development plan)	185
5.e Property management plan or other management system	187
5.f Sources and levels of finance	191
5.g Sources of expertise and training in conservation and management techniques	192
5.h Visitor facilities and infrastructure	193
5.i Policies and programmes related to the presentation and promotion of the property	197
5.j Staffing levels and expertise (professional, technical, maintenance)	202
6. Monitoring	206
6.a Key Indicators for measuring state of conservation	206
6.b Administrative arrangements for monitoring property	207
6.c Results of previous reporting exercises	207
7. Documentation	216
7.a Photographs and audiovisual image inventory and authorization form	216
7.b Texts relating to protective designation, copies of property management plans or documented management systems and extracts of other plans relevant to the property	220
7.c Form and date of most recent records or inventory of property	220
7.d Address where inventory, records and archives are held	220
7.e Bibliography	220
8. Contact Information of responsible authorities	224
8.a Preparer	224
8.b Official Local Institution/Agency	224
8.c Other Local Institutions	224
8.d Official Web address	224
9. Signature on behalf of the State Party	225

Appendix 1: Taxa of plants, inter-tidal molluscs and vertebrates identified from Palaeolithic levels in the caves within the candidate World Heritage Site.	227
Appendix 2: Insect taxa present in Gibraltar for which there is circumstantial evidence of their presence in the Gibraltar Neanderthal landscape.	234
Appendix 3: Institutions that have contributed to the research at Gorham’s and Vanguard Caves, 1989-2014 (in alphabetical order).	251

Executive Summary

State party: United Kingdom

State, province or region: Gibraltar

Name of property: Gibraltar Neanderthal Caves and Environments

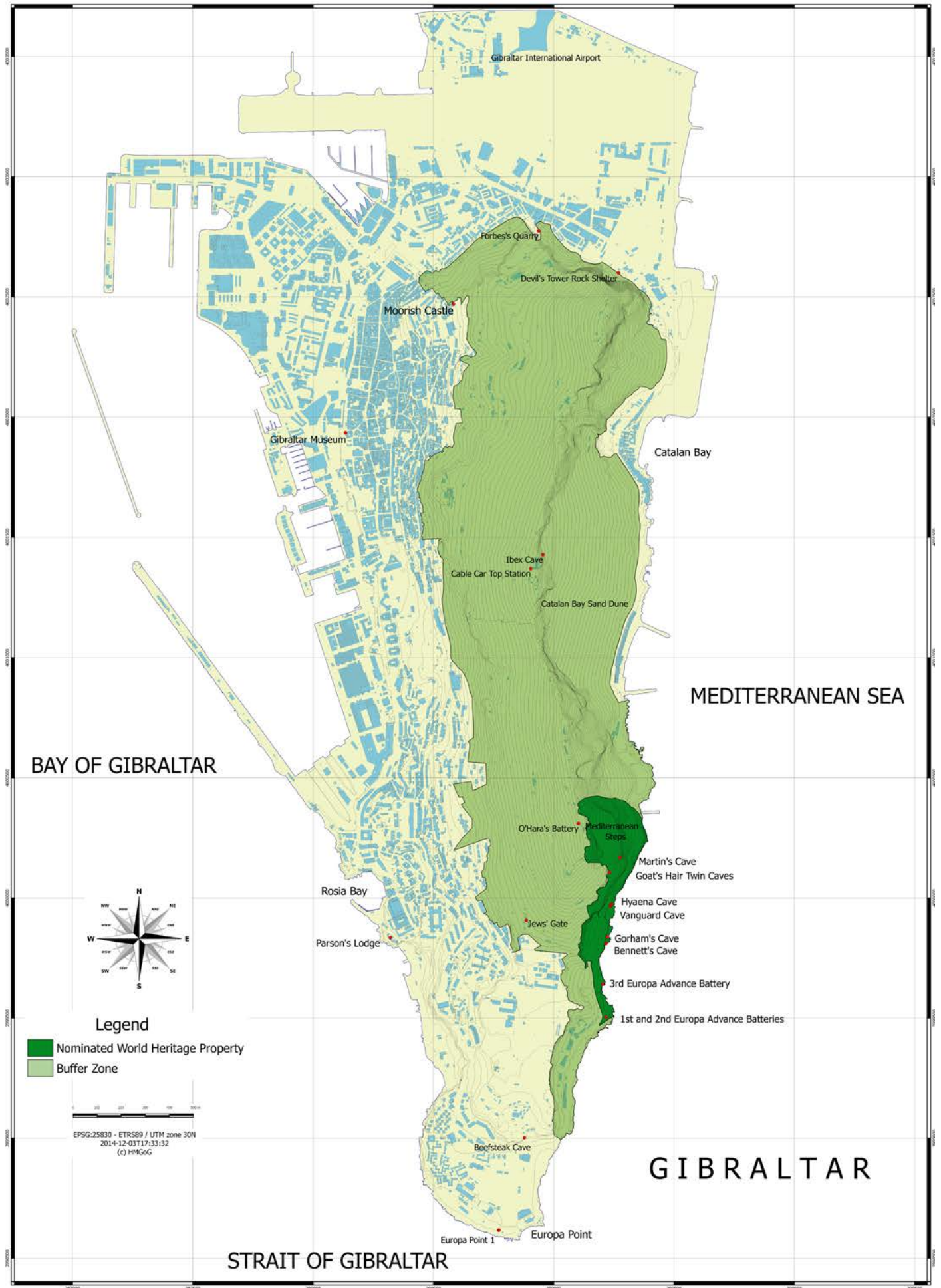
Geographical coordinates to the nearest second: 36° 07' 21.61" N; 05° 20' 31.42" W

Textual description of the boundary of the nominated property:

The nominated property covers 28 hectares of cliffs, caves and scree slopes on the eastern side of the Rock of Gibraltar, from sea level to the highest peak at 426m. The entire property is within the Gibraltar Nature Reserve. The boundaries, clearly visible as natural topographical features, delimit all the attributes that confer Outstanding Universal Value and follow natural lines which encompass the five major morpho-tectonic units of the Rock of Gibraltar. The eastern boundary is delimited naturally by the Mediterranean coastline. The southern boundary follows natural cliff lines from sea level to the highest point of the Rock and its northern boundary follows a steep topographical discontinuity in the contours, also from sea level to the highest point. The western boundary is delimited by the ridge of the Rock itself at its highest point.

Criteria under which property is nominated: (iii) and (v)

A4 size map of the nominated property showing boundaries and buffer zone for Gibraltar Neanderthal Caves and Environments



Draft statement of Outstanding Universal Value

a) Brief Synthesis

The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and 46 caves on the east side of the Rock of Gibraltar bordering the Mediterranean Sea. Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea-level rise and fall, some caves now being partly submerged and others offshore lying in the sea bed. Exceptionally, given the abrupt relief, some caves – most notably Gorham’s and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years. Four caves have archaeological evidence of Neanderthal occupation and four of the first modern humans. They have generated a large body of information on the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique examples of the exploitation of birds and marine mammals for food. Gorham’s and Vanguard Caves have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. The caves have been excavated systematically over 25 years but vast deposits remain intact, retaining huge potential.

Lush Mediterranean vegetation and intertidal animals - species known to have predominated at the time of the Neanderthals - continue to cover the cliffs, slopes and rocky beaches. Resident birds, present when the Neanderthals lived here, still breed within the site while many migratory species rest or fly over the site during their annual migrations between Europe and Africa. Put together, all these elements offer the most complete picture of the Neanderthal world anywhere. Importantly, there are significant components surviving to the present which provide a unique opportunity to study and interpret the Neanderthal way of life in a natural context. The subsequent presence of early modern humans offers an excellent opportunity to compare the lifestyles of two human lineages within the same eco-geographical context, a comparison that is revealing great similarities between the two lineages and that is changing our view of the abilities of the Neanderthals. This extraordinary combination provides an exceptional and vivid picture of the Neanderthals, their way of life and environment, and gives the property its Outstanding Universal Value.

b) Justification for Criteria

Criterion (iii): The site provides an exceptional testimony to the Neanderthals, a people and their cultural traditions, who are now extinct. Rock engravings, stone tools, hearths, bones with cut marks and evidence of burning, and molluscs showing fracture marks made with stone tools are the primary evidence of the Neanderthals. A rich array of fossil vertebrates (including the highest avian species diversity of any site), molluscs, pollen and charcoal provide the climatic and ecological context for Neanderthal and subsequent early modern human occupation. The enormous depth of archaeological and palaeontological deposits in Gorham’s and Vanguard Caves spans 125,000 years. An outstanding high-resolution record thus allows comparisons across a huge time span and permits analysis of stasis and change in cultural traditions. The quality of resolution allows understanding of the daily activities of the Neanderthals, including their capacities for abstract thinking. The spatial distribution of sites permits a detailed understanding of how the Neanderthals exploited their territory. The present environments of the site contain plants and bird species which shed light on this lifestyle. Our knowledge of the abilities and cultural traditions of the Neanderthals has changed decisively as a direct consequence of the evidence provided by this incomparable site.

Criterion (v): The site is of Outstanding Universal Value because its topography, geological features, natural cliff vegetation and rocky shoreline communities, afford a clear vision of a place which was once home to the Neanderthals. Nowhere is the relationship of the Neanderthals and their environment more palpable than it is in this site. It offers important features that allow us to understand and interpret the traditional lifestyle of the Neanderthals in their environment, and also to compare it to that of early modern humans. Part of this landscape was subjected to irreversible change with sea level rise 10,000 years ago; ancient raised beaches, scree slopes, shorelines and dunes within the site are reminders of the dynamic and precarious nature of a coastal world that was in a constant state of flux. The evidence in the caves enables us to understand how Neanderthals and modern humans adapted to these changes, varying their subsistence strategies as opportunities arose. The incomparable topography of the Rock of Gibraltar, as well as its modern-day flora and fauna, with many species still present from ancient times, opens up an exclusive window into the lost world of the Neanderthals.

c) Statement of Integrity

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The boundaries follow natural topographical features that incorporate the complete series of attributes that gives the site Outstanding Universal Value. The geological and archaeological attributes are exceptionally well-preserved while a significant proportion of the flora and fauna present in the Palaeolithic is still present today. In addition to their intactness, the attributes have a clear coherence within the boundaries of the property. The inclusion of a significant area surrounding the caves makes it

possible to understand more fully the ways in which the Neanderthals interacted with their surroundings; it also guarantees that the nominated property is of adequate size to ensure the complete representation of the features and processes that convey its significance. Risks affecting the property are largely related to long-term climate change and sea level rise; shorter term risks with natural fires and rock falls; they are considered to be low and are closely monitored. The attributes are not threatened by development, deterioration or neglect. A combination of legal protection, active management, vertical scale and topography minimises risk to the property, which can only be appreciated if its dynamic character is fully understood.

d) Statement of Authenticity

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning. These attributes fall into three distinct categories: 1) the stratified deposits within the caves which contain a wealth of information that situates the site in a time framework are wholly authentic in material and substance. They contain engravings, artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first modern humans. 2) the form and substance of the caves themselves, their location and setting, the surrounding cliffs, their geological formations and the tangible evidence of climate and sea-level change (ancient beach levels); and 3) well-preserved relict cliff vegetation and faunal elements that have a direct connection with the vegetation that grew on these cliffs when Neanderthals and modern humans lived in the caves.

e) Requirements for Protection and Management

Ownership of the site rests with Her Majesty's Government of Gibraltar which has appointed the Gibraltar Museum, through its Director, as manager. A small section of the site is owned by the UK Ministry of Defence. All the key attributes of OUV are entirely situated within HMGoG-owned (non-leased out) land. The site has full legal protection as part of the Gibraltar Nature Reserve; individual caves are also Schedule 1 Category A (maximum protection) sites under the Gibraltar Heritage Trust Act. Additional protection is provided by the Town Planning Act. Access to fragile caves is strictly controlled, permitted only with a guide approved by the Gibraltar Museum Director. The Mediterranean Steps are open to the public and are maintained with interpretation; the relict vegetation along the cliff walk is not threatened. Wildlife is protected through the Gibraltar Nature Reserve Act. Visitor numbers to sensitive parts of the site are and will be restricted and closely-monitored. Systems of access control will be updated as technology improves. Archaeological excavations are managed to ensure no loss of site integrity. An international committee of experts reviews relevant plans from the perspective of conservation, maintenance of site integrity and academic standards.

A Steering Committee is guiding the process of nomination; this Committee will become an Advisory Forum if the property is inscribed. Non-governmental organisations (Gibraltar Ornithological and Natural History Society; Gibraltar Heritage Trust) with site interests are directly involved in management processes. A dedicated multi-disciplinary team based at the Museum is implementing the Management Plan. Levels of resourcing, including staff levels, are reviewed annually. There will be a five-year review of the management plan and systems, legal protection and research strategies, with annual monitoring and reporting. Particular emphasis is given to risk management and to improving visitation opportunities. The general public is kept informed of work undertaken through regular lectures, press, television and social media and direct participation.

Name and contact information of official local institution/agency:

The Gibraltar Museum

Ministry for Culture and Heritage
Her Majesty's Government of Gibraltar
18-20 Bomb House Lane
Gibraltar

Telephone: +350 200 74289

Fax: +350 200 79158

Email: clive.finlayson@gibmuseum.gi

Web Site: www.gibmuseum.gi

1. Identification of the property

- 1.a Country: United Kingdom
- 1.b State, province or region: Gibraltar
- 1.c Name of property: Gibraltar Neanderthal Caves and Environments
- 1.d Geographical coordinates: 36° 07' 21.61" N; 05° 20' 31.42" W
- 1.e Maps and plans, showing boundaries of the nominated property and buffer zone:
Figures 1.1 and 1.2
- 1.f Area of nominated property and proposed buffer zone:

Nominated Property: 28ha.
Buffer Zone: 313ha.
Total: 341ha.

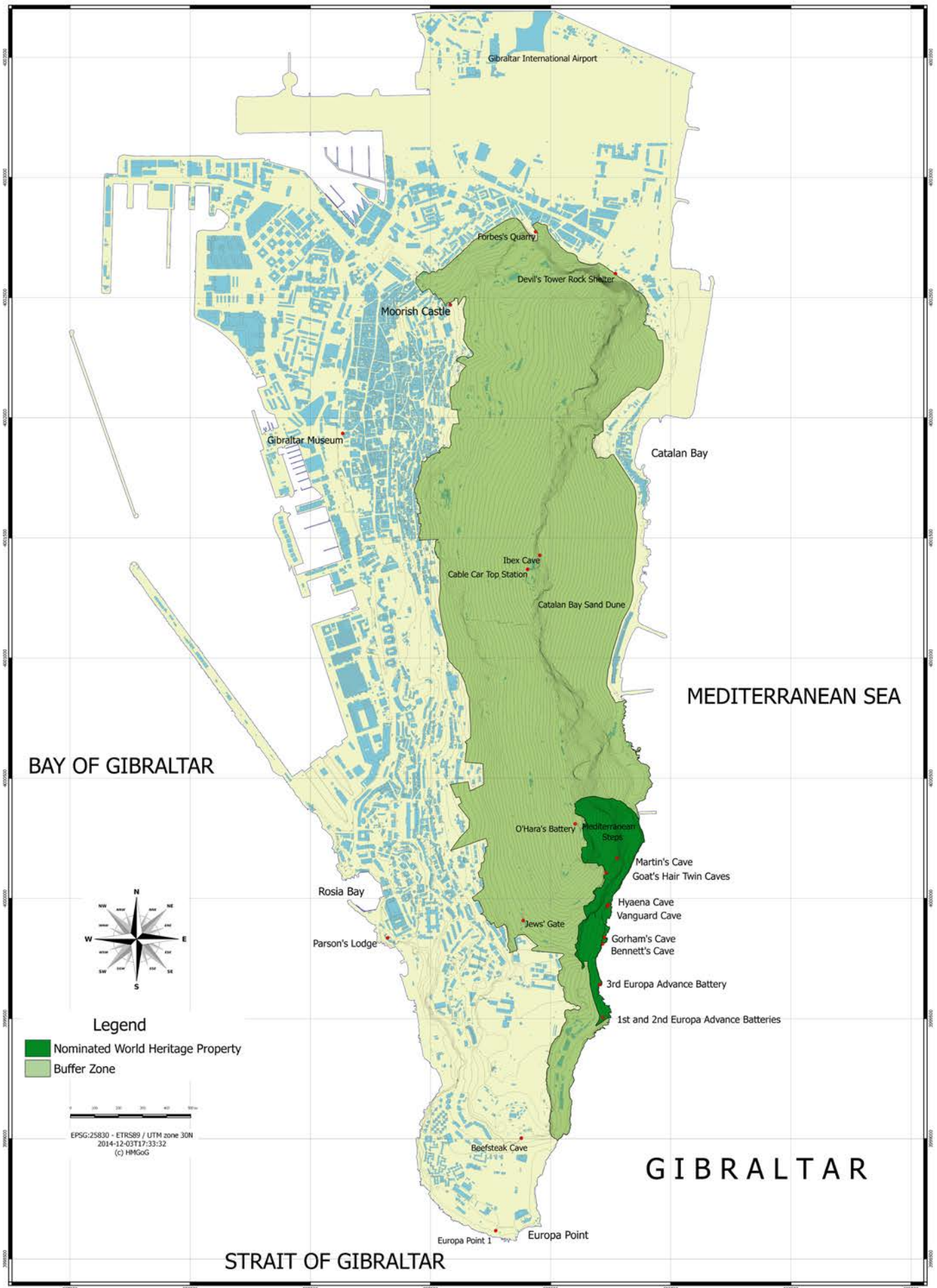


FIGURE 1.1 Map of Gibraltar showing boundary of nominated World Heritage Site and its buffer zone, with key features.

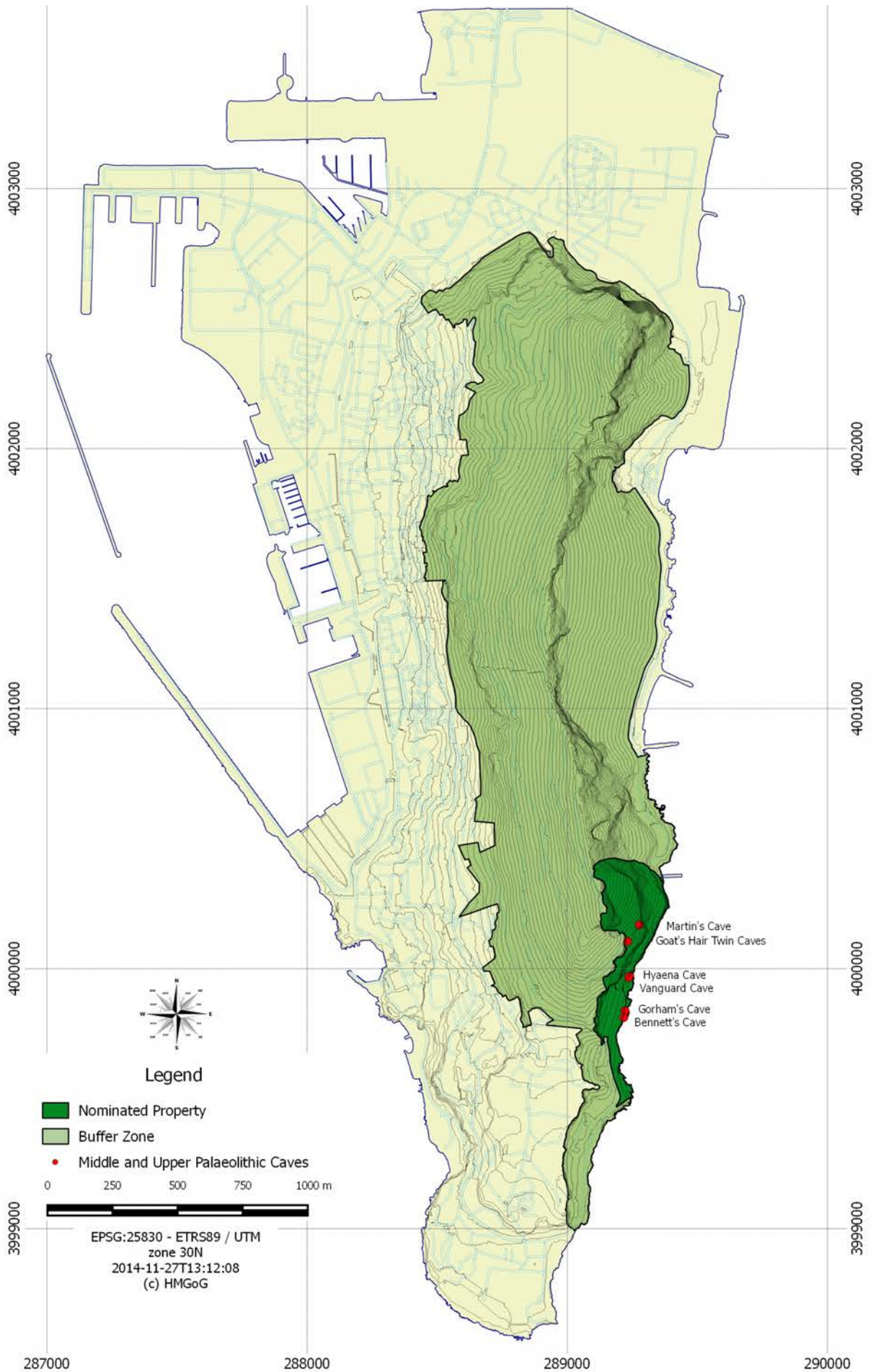


FIGURE 1.2 Map of Gibraltar showing the location of the seven main caves within the nominated property that have archaeological evidence of occupation in the Late Pleistocene. The Goat's Hair Twin Caves are so named because they are two situated beside each other.

2. Description

2.a Description of property

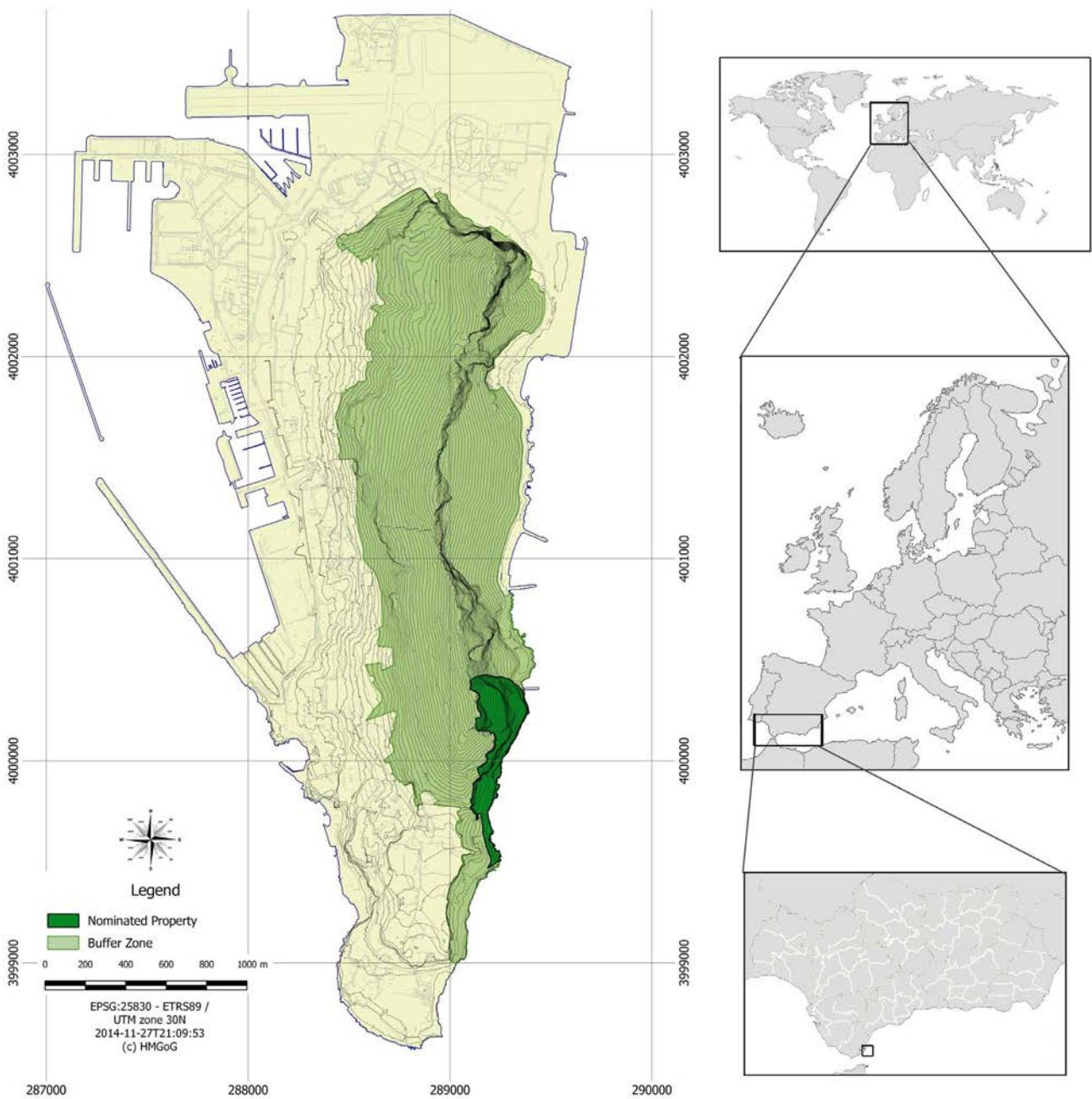


FIGURE 2.1 Map of the nominated World Heritage Site, showing its position in Europe.

2.a.1 Introduction to the site

The nominated property lies on the eastern side of the Rock of Gibraltar, on the south-western tip of the Iberian Peninsula (Figure 2.1) and only 21 kilometres (km) from the coast of North Africa (Figure 2.2). It marks the north-eastern limit of the Strait of Gibraltar which connects the Mediterranean Sea with the Atlantic Ocean. The Rock is therefore situated in the heart of a major geographical nexus, where two continents and two large bodies of water meet. It has been known since classical times as the northern Pillar of Hercules - *Mons Calpe*. Together with Jebel Musa (*Mons Abyla*, the other Pillar) on the Moroccan coast opposite, it has been a universally-recognisable silhouette and one of the Earth's major landmarks to mariners for millennia. The Rock extends from current sea level to its ridgeline at 426 metres (m) AOD (Figure 2.3).

The property is a Neanderthal occupation site that retains features and functions which have persisted to the present day. The coastal plain which, along with the cliffs, was the hunting ground of the Neanderthals is currently submerged but would have been emerged for long periods except during high-level sea stands during inter-glacials and during the past 10,000 years.

The property's principal components are two large sea-level caves – Gorham's and Vanguard - which contain an exceptional archaeological and palaeontological record of Neanderthal occupation over a period of approximately 100,000 years. It is the longest and most detailed record of their way of life that is currently available.

This outstanding record includes elements which have changed our perception of the Neanderthals, their capacities and culture. This is the Neanderthals' defining site (Figure 2.3). The caves are situated at the base of an impressive cliff that provides additional caves and shelters, cliff vegetation, avifauna, intertidal invertebrate communities and tectono-eustatic features, including raised beaches and fossil dunes. Four caves within the site have evidence of Neanderthal presence and four of modern humans after the Neanderthals.



FIGURE 2.2 The Rock of Gibraltar has been known since classical times as the northern Pillar of Hercules - *Mons Calpe*. Together with Jebel Musa (*Mons Abyla*, the other Pillar) on the Moroccan coast opposite, it has been a universally-recognisable silhouette and one of the Earth's major landmarks to mariners for millennia. Photo: The Rock of Gibraltar from the north-east (foreground) with Jebel Musa, Morocco, in the background. Maps show location of Gibraltar in the context of Europe, Africa and the Strait of Gibraltar.



FIGURE 2.3 The property is the Neanderthals' defining site. Its principal components are two large sea-level caves – Gorham's and Vanguard – which contain an exceptional archaeological and palaeontological record of Neanderthal occupation over a period of approximately 100,000 years. It is the longest and most detailed record currently available.

In spite of the high population density of Gibraltar, the nominated property is in an area of the Rock largely unaffected by modern development or other human impact. It extends from sea level to the top of the Rock and is covered by natural vegetation. The site is traversed by a pathway, the Mediterranean Steps, parts of which date to the 19th Century. At its southern extremity, it includes a short stretch of modern road. Apart from this the only man-made features are a small number of historic military structures such as batteries and some associated buildings, themselves of historic interest. The nominated World Heritage Site covers an area of 28ha which constitutes 3.3% of the entire territory of Gibraltar (Figure 1.1). With the buffer zone included the area of the territory covered is 40.7%. The broader setting of the site is described below before a more detailed exposition of the site itself and its individual elements.

2.a.2 Introduction to the Neanderthals

In order to best appreciate the significance of the property, an understanding of the Neanderthals, their geographical distribution, chronological framework and evolutionary significance is essential. For this reason, a brief introduction to the Neanderthals has been included in the property description.

The Neanderthal was a lineage of the genus *Homo* which is regarded by some students as a separate species *Homo neanderthalensis* and by others a sub-species of *Homo sapiens* (Stringer

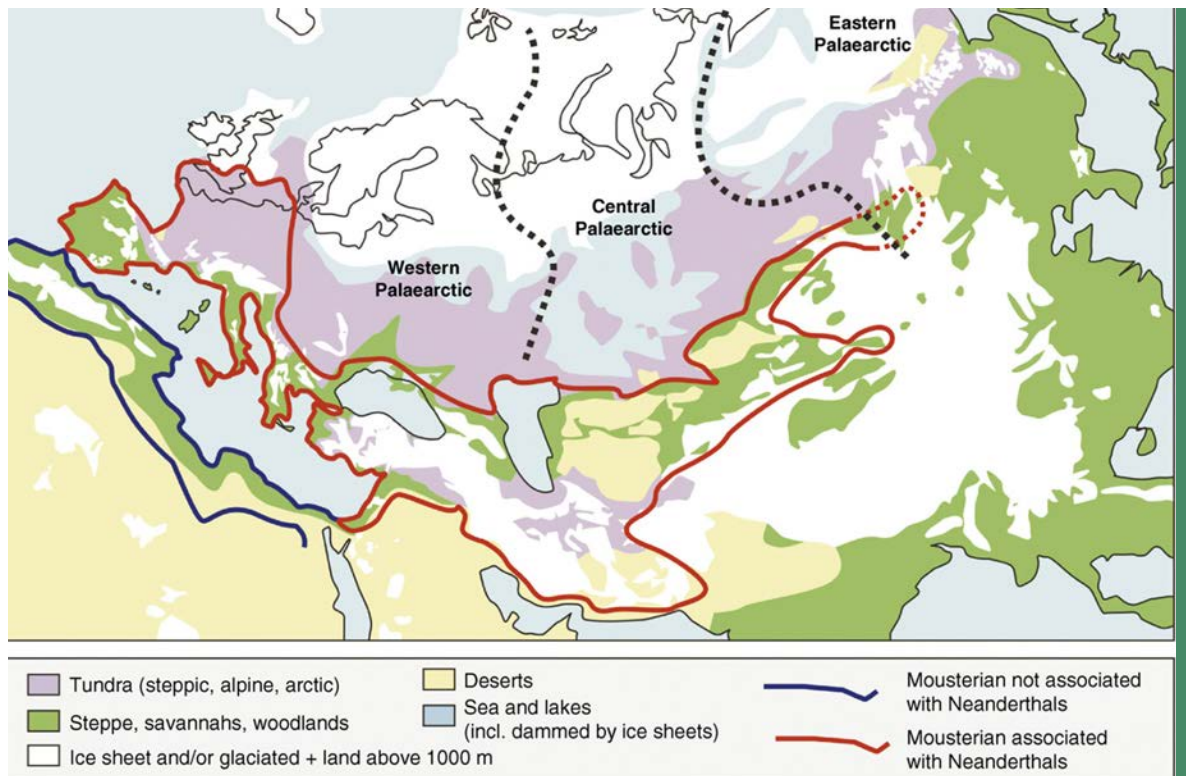


FIGURE 2.4 Maximum extent of the Neanderthal geographic range (red). During cold phases the range became significantly restricted to the south (see also Fig. 2.5). Blue indicates presence of early modern humans in northern Africa. Contact between the two lineages is thought to have occurred in the Middle East around 100-130,000 years ago but, in the west, the Strait of Gibraltar appears to have been a barrier in spite of their close proximity. After Finlayson & Carrión (2007).

& Gamble, 1993; Finlayson, 2009 and 2014). The Neanderthal lineage split from the modern human lineage sometime around 400,000 years ago (Weaver *et al.*, 2008) and occupied vast areas of Eurasia (Figure 2.4). No Neanderthal remains have been found in Africa. The Neanderthals were adapted to open woodland landscapes where they could exploit a wide range of resources. During cold glacials, much of their range became inhospitable and Neanderthals survived in the southern peninsulas, in Iberia, Italy, the Balkans and Crimea (Figure 2.5). Southern Iberia, particularly the coastal south-west around Gibraltar had the most benign climate because of the tempering influence of the Atlantic Ocean, distance from the high mountain glaciers and high latitudes (Figure 2.6; Finlayson, 2008). It was here that Neanderthals persisted without interruption for the entire last glacial cycle (the Late Pleistocene, between 123,000 and 10,000 years ago).

The earliest evidence of modern humans outside Africa is in the Middle East where a first appearance is recorded around 130,000-100,000 years ago (Grun *et al.*, 2005). It was probably in this region that Neanderthals and modern humans first met after 300,000 years of isolation. Today we know that the two lineages interchanged genes with a Neanderthal contribution of between 1.5 and 2.1% to people of European ancestry (Prüfer *et al.*, 2014). In spite of the close proximity of modern human and Neanderthal populations, facing each other across the Strait of Gibraltar (Figure 2.4), there is currently no evidence to support maritime contact between the two populations. It would take modern humans another 100,000 years to reach the northern shore of the Strait of Gibraltar, spreading from east to west across Europe from the Middle East (Bar-Yosef & Pilbeam, 2000). By the time modern humans reached this region, the Neanderthals were extinct.

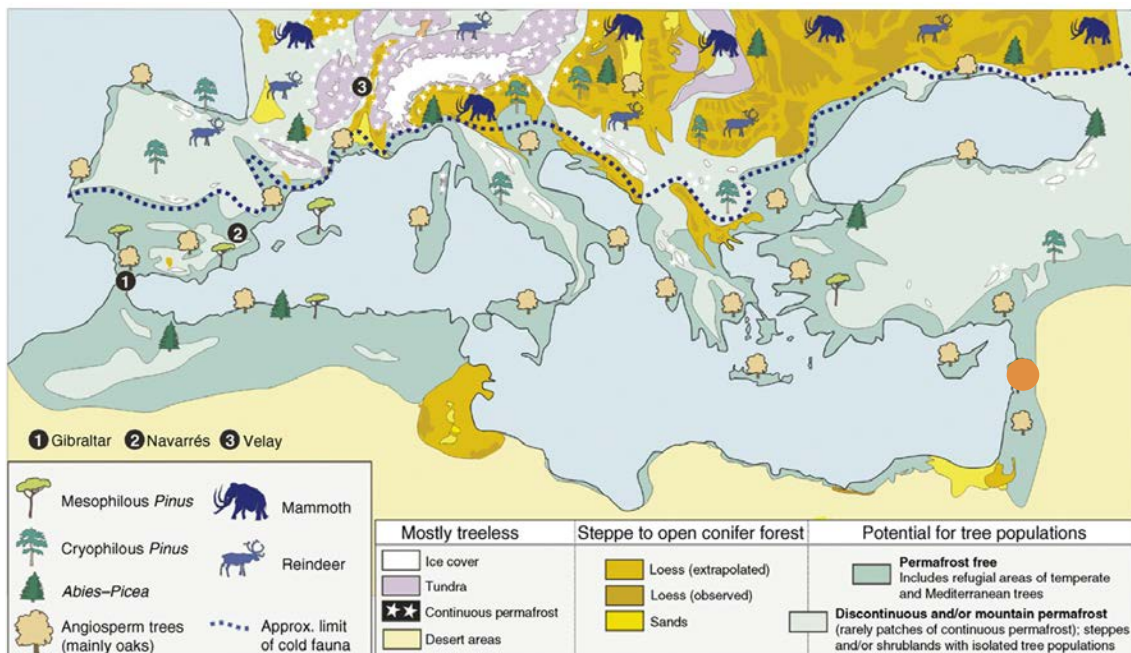


FIGURE 2.5

Maximum extent (dotted line) of the cold fauna and vegetation during glacial in Europe. When the ice sheets advances south the Neanderthals retreated to strongholds, the principal one being around Gibraltar (numbered 1). Mount Carmel in Israel is indicated by an orange dot. After Finlayson & Carrión (2007).

The Gibraltar nominated World Heritage Site thus complements the Mount Carmel World Heritage Site in Israel (Figure 2.5), the only site currently on the World Heritage List that represents the Neanderthals. Mount Carmel records an early Neanderthal presence and the first contact with modern humans during the last interglacial, between 130,000 and 100,000 years ago, whereas Gibraltar records a 100,000-year Neanderthal occupation from the last interglacial to the latest surviving populations. Additionally, and most importantly, Gibraltar offers us a detailed record of how Neanderthals lived and survived in isolation at a time when modern human-Neanderthal contact was taking place in other parts of the world. The behaviour of the Neanderthals in Gibraltar cannot therefore be attributed to any process of acculturation due to contact with modern humans. Gibraltar is therefore crucial to our understanding of the Neanderthals and the world in which they lived.

2.a.3 The nominated World Heritage Site as a natural laboratory and archive

The Gibraltar Neanderthal Caves and Environments site is an archive of information of Outstanding Universal Value and is set in an environment which retains many features of the remote past. A direct comparison between these present-day functions of the environment, using living species as proxies, and those of the past has proved fruitful and has made the property an exceptional natural laboratory. The backdrop to the property is the Rock of Gibraltar itself, one of the most highly-significant and recognisable sites in the world. Its significance derives from its geographically-privileged situation at the meeting of two continents - Europe and Africa - and two seas – the Atlantic Ocean and the Mediterranean Sea. It is a Jurassic Limestone block which is situated at the southern end of the Iberian Peninsula, 21km north of the coast of Morocco in North Africa (Figure 2.1). The Rock is c. 6km in length and 1.5km in width and rises sharply from the sea to a maximum altitude of 426m at its southern peak, within the nominated property (Figure 2.3). To the north, the Rock is linked to the mainland by a sandy, now largely built-up, tombolo and to the west it is delimited by the City and Bay of Gibraltar. The eastern coastline, adjacent to or part of the property faces the Mediterranean Sea. The Rock's southernmost cliffs, at

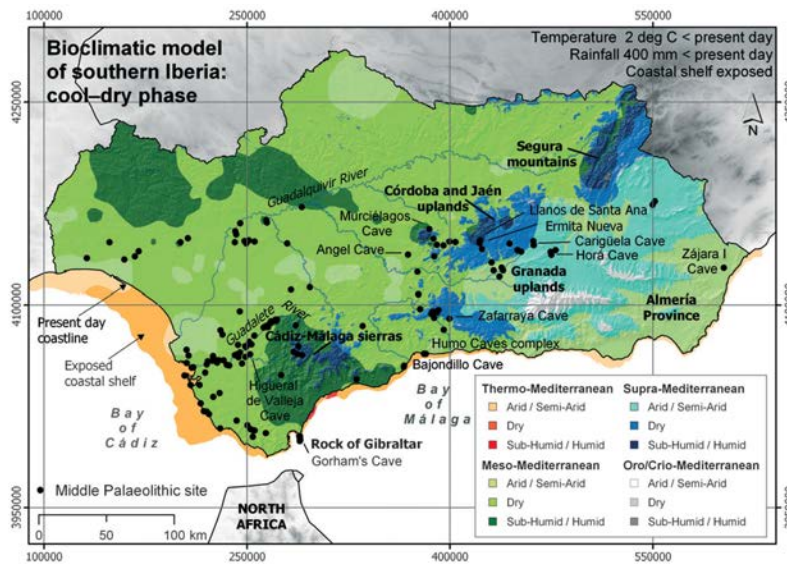


FIGURE 2.6

Bioclimatic map of southern Iberia, modelled for typical glacial conditions. The south-west, close to the Atlantic and away from the high mountains, always retained mild temperatures and good amounts of rainfall. From Jennings *et al.* (2011).

Europa Point, face the Strait of Gibraltar and the African continent beyond. The Rock is a beautifully-preserved geomorphological feature with an exceptional stratigraphic record of the tectono-eustatic evolution covering the Pliocene and Pleistocene (5.33 million years ago to 10,000 years ago, Rodríguez-Vidal *et al.*, 2004, sub-section 2.a.4, below). All the key elements of this record are contained within the property.

The cliffs of the Rock of Gibraltar constitute an unspoilt record of the Earth's climatic history over the last two million years and are additionally of great beauty, having been captured by many painters of the 18th and 19th centuries. As such they are a major component of the symbolic image of "the Rock" and have been the recognisable feature and beacon to mariners approaching from the Mediterranean Sea since at least the seventh century BCE. They comprise the entire eastern and northern faces of the Rock and fall within the proposed World Heritage Site or its buffer zone (Figure 2.7).

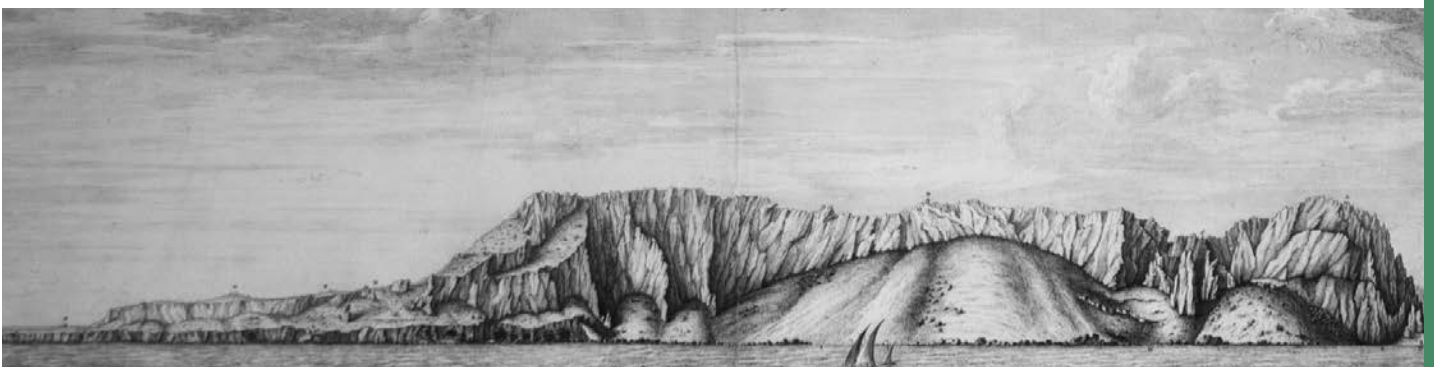


FIGURE 2.7

The cliffs of the Rock of Gibraltar have been captured by many artists of the 18th and 19th centuries. They are a major component of the symbolic image of "the Rock" and have been a recognisable feature and beacon to mariners approaching from the Mediterranean Sea since at least the seventh century BCE. Image: East view of Gibraltar, 2nd January, 1775. Engraving: W. H. C. Jones (sculptor), J. Mace (artist), J. Boydell (publisher), Cheapside, London. Gibraltar Museum collection.

Table 2.1 Caves located within the candidate World Heritage Site

Reference Number	Cave Name	Area ¹	Cultural attribution ²	Remarks
1	Unnamed 1	A		submerged
2	Coptic	A	Pt, PMH	potential ³
3	South	A		
4	Bennett's	A	MP, Pt	potential
5	Gorham's	A	MP, UP, N, Pt	potential
6	Vanguard	A	MP	potential
7	Hyaena	A	MP	potential
8	Finlaysons'	A		
9	Boat Hoist	A	PMH	pt. submerged
10	Cormorant	A		pt. submerged
11	Sandy Lower	A		pt. submerged
12	Gunn's	A		
13	Smith's	A		
14	Winkie's	A		
15	Swallow Nest	A		
16	Marble Arch	A		pt. submerged
17	Unnamed 3	A		pt. submerged
18	Unnamed 4	A		pt. submerged
19	Unnamed 5	A		pt. submerged
20	Unnamed 6	A		pt. submerged
21	Unnamed 7	A		pt. submerged
22	Unnamed 8	A		pt. submerged
23	Unnamed 9	A		pt. submerged
24	Smuggler's	A		
25	Monkey's	A	PMH	
26	Sandy Upper	A	PMH	
27	Dickson's	A	PMH	
28	Columba	A		
29	Martin's 1	B	UP, N, Me, PMH	potential
30	Martin's 2	B		
31	Fig Tree No2	B		potential
32	Martin's Guard No 1	B	PMH	
33	Martin's Guard No 2	B	PMH	
34	Spider	B		
35	John's Giant	B		
36	Reservoir No5	B		
37	Reservoir No4	B		
38	Mediterranean	B	PMH	
39	Collins's	B	N	potential
40	Goat's Hair No1	B	UP, N	potential
41	Goat's Hair No2	B	UP, N	potential
42	Unnamed 10	B		
43	Unnamed 11	B		
44	Unnamed 12	B		
45	Unnamed 13	B		
46	Unnamed 14	B		

¹ A – Gorham's Cave Complex; B Main Cliff

² MP – Middle Palaeolithic, UP – Upper Palaeolithic, N – Neolithic, Pt – Protohistoric, Me – Medieval, PMH – Post-medieval Historic

³ Potential in the remarks column means that the cave has potential for further excavation

Forty-six caves are situated within the nominated World Heritage Site (Table 2.1). These caves are classified into two clusters:

A Gorham's Cave Complex - 28 caves at the base of the southern peak of the Rock of Gibraltar between sea level and +60m AOD. The caves are situated within the most recent (250,000 years ago to present day) morpho-tectonic unit of the Rock (Rodríguez-Vidal *et al.*, 2004); and

B Southern Peak - 18 caves on the cliffs of the southern peak of the Rock of Gibraltar, above (a), between +60 and 426m AOD.

The property thus contains four caves with Middle Palaeolithic archaeology attributable to the Neanderthals: Bennett's, Gorham's, Vanguard and Hyaena (Table 2.2). Additionally, there are four caves with Upper Palaeolithic archaeology attributable to the first modern humans that reached the region: Gorham's, Martin's 1, Goat's Hair 1 and 2 (Goat's Hair Twin Caves). Gorham's and Vanguard Caves offer a complete Late Pleistocene sequence of Neanderthal and modern human occupation and the other five sites supplement this impressive record.

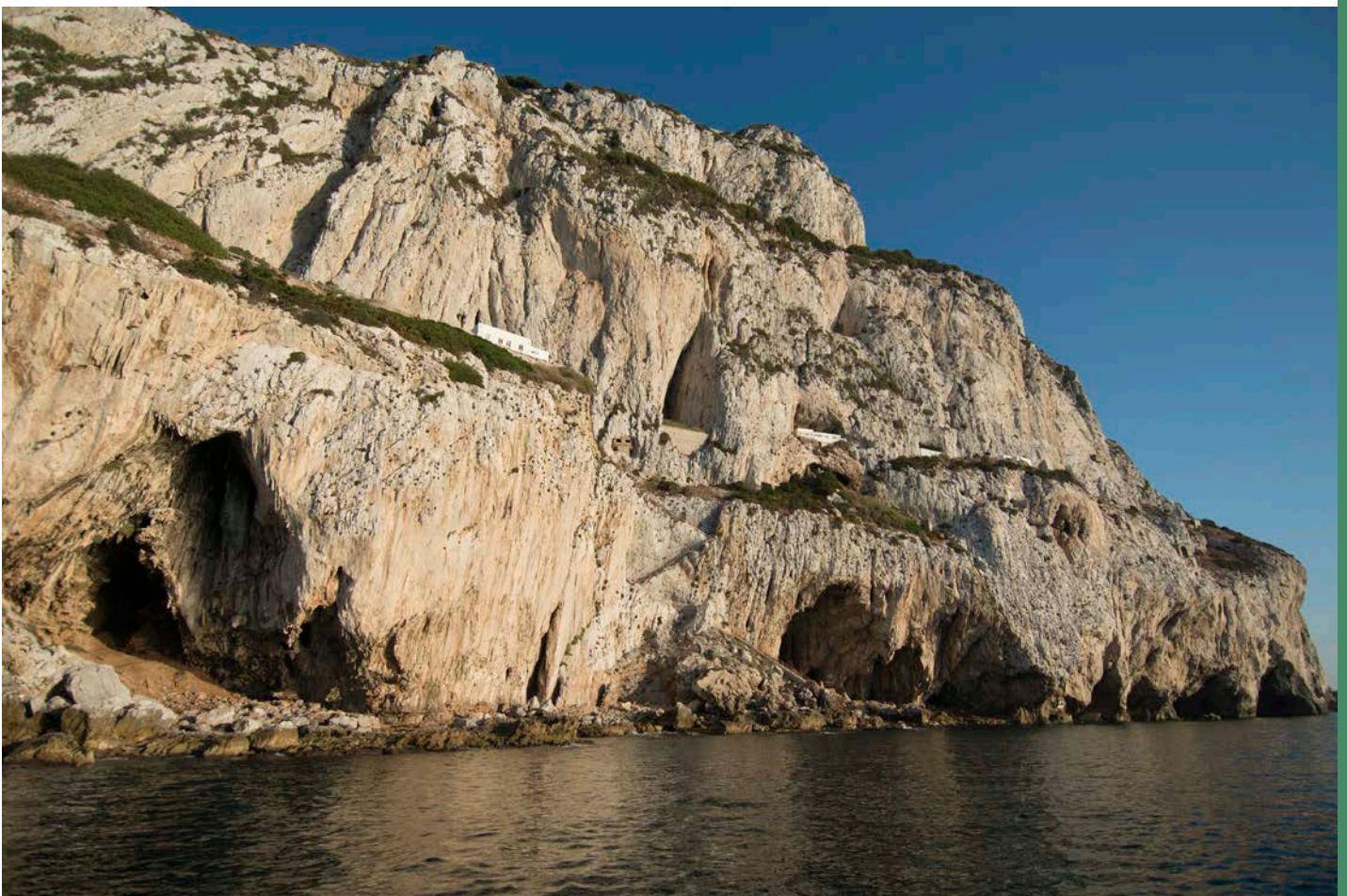


FIGURE 2.8 The caves cluster to form an exceptional example of a Neanderthal settlement.

Table 2.2 Caves within the nominated property by cultural attribution and cluster

Cultural attribution	Number of caves		Total
	Cluster A	Cluster B	
Middle Palaeolithic	4	0	4
Upper Palaeolithic	1	3	4
Neolithic	1	4	5
Protohistoric	3	0	3
Medieval	0	1	1
Post-medieval Historic	5	4	9

Twenty-eight coastal, submerged or partly submerged caves within the Gorham’s Cave Complex (Table 2.1, Area A) would have also been occupied or visited by the Neanderthals and modern humans as they have similar topographical characteristics and lie close to the other caves. Sea level rise 10,000 years ago washed away any archaeological deposits (although small pockets of sediment remain in fissures) in many of these but they nevertheless complement the archaeological caves in allowing an understanding of the function of a group of caves at sea level – the Gorham’s Cave Complex - that was the home of the Neanderthals. In effect, the caves (including those that no longer offer archaeological evidence because of sea-level rise) cluster to form an exceptional example of a Neanderthal settlement (Figure 2.8 and Figure 2.9).

Our understanding of the Neanderthal world is enhanced by the sheer cliffs and scree slopes that are incorporated within the property. These are major topographical features, within which the caves are embedded, that provide a vivid spatial context for a place that was the home of the Neanderthals for 100,000 years. The dunes along with raised beaches that reach up to 210m AOD and the chronological sequences within the caves themselves, provide an unrivalled temporal context of tectonic and climate change that spans the entire Pleistocene. The caves, cliffs and related geological formations thus offer an exceptional window into the world of the Neanderthals in a spatial and temporal framework that is unparalleled (Figure 2.10).



FIGURE 2.9 Boat Hoist Cave, north of Vanguard Cave, is one among twenty-eight coastal, submerged or partially submerged caves within the Gorham's Cave Neanderthal Complex.



FIGURE 2.10 As well as providing a unique complement to the rocky elements of the Neanderthal landscape, the dunes along with raised beaches that reach up to 210m AOD and the chronological sequences within the cave deposits themselves, provide an unrivalled temporal context of tectonic and climate change that spans the entire Pleistocene. Photograph shows fossil dune deposits at Martin's Cave 2, 190m AOD, cemented against the cave wall. These would have been deposited in this cave when it was at sea level. They were subsequently lifted almost 200m by tectonic activity.

In addition to the physical attributes of the site, there are biological components that enhance the picture even further. Vegetation – comprising species which have been present since the time of the Neanderthals - is distributed across the limestone cliffs from sea level to the highest point. Birds utilise the property for breeding or as a migration stop-over between Europe and Africa as they did when the Neanderthals occupied the site. A well-preserved and protected intertidal invertebrate community and an offshore presence of cetaceans adds colour to the range of fauna that the Neanderthals are known to have exploited at this site. Nowhere (as detailed in Section 3.2, Comparative Analysis) can we understand the world of the Neanderthals and how it functioned as we are able to do on Gibraltar (Figure 2.11).

2.a.4 Geological and Environmental History

In order to appreciate the nominated property, its geological and environmental history and context require explanation. The site is above all else about: (a) the well-preserved contents that constitute a veritable archive; and (b) the physical and biological functions that have persisted and create a natural laboratory. At times the landscape would have been similar to today and at others, with sea level drop, quite different. The basic geological structure of the Rock itself, however, would have been very similar to today throughout the period of Neanderthal occupation. The site can only be fully appreciated if the backdrop that generated, and continues to shape it, is understood. The geomorphological features within the site have been well studied (Rodríguez-Vidal & Gracia, 2000; Rodríguez-Vidal *et al.*, 2004) and tell this story. This Gibraltar Neanderthal natural laboratory was created by a combination of tectonic uplift, as the African tectonic plate pushed into the European plate (Rose & Rosenbaum,



FIGURE 2.11 Common Dolphins *Delphinus delphis* and Cory's Shearwaters *Calonectris borealis* feeding off the Gorham's Cave Neanderthal Complex. Nowhere in the world can we understand and visualise the world of the Neanderthals as we are able to do on Gibraltar.

1994), and climatic-driven (eustatic) sea level change (Rodríguez-Vidal *et al.*, 2013). These fluctuations in sea level, against a backdrop of a rising Rock, kept altering the landscape by exposing and submerging the coastal shelf, by acting on the coastal cliffs and opening up sea caves, by generating mobile dune fields and by encouraging rock falls and landslides which created scree slopes (Figure 2.12).

The landforms within the site have therefore been formed by two main groups of processes:

- (i) tectonic structural movements that determine the general shape; and
- (ii) surface erosional and depositional processes that have acted on the uplifted rocks.

Coastal processes have been particularly active in the eastern face of the Rock, where there is greater fetch (the length of water over which the wind has blown). The combination of tectonic and eustatic fluctuations has caused changes in the location of the coastal landforms and has controlled the evolution of slopes. The solidification of the Quaternary deposits has led to the preservation of a varied group of sediments which represent processes that indicate a rapid and complex geomorphological development and neo-tectonic uplift history (Figure 2.13).

The sequences at Gorham's and Vanguard Caves have been intensively studied and extensively dated by Electron Spin Resonance, Accelerator Mass Spectrometry, Optically Stimulated Luminescence and Uranium/Thorium (Finlayson *et al.*, 2006; Barton *et al.*, 2012). They confirm that the deposits in the caves cover a timescale commencing in the Last Interglacial and concluding with the presence of a Phoenician/ Carthaginian shrine that ceased functioning in the third century BCE. Within the sequences at Gorham's and Vanguard Caves there is a detailed record of vegetation and fauna that has provided evidence for the quantitative reconstruction of environments that were exploited by Neanderthals, including during the abrupt environmental changes at the end of Marine Isotope Stage



FIGURE 2.12 Fluctuations in sea level, against a backdrop of a rising Rock, kept altering the landscape by exposing and submerging the coastal shelf, by acting on the coastal cliffs and opening up sea caves, by generating mobile dune fields and by encouraging rock falls and landslides which created scree slopes.

(MIS) 3 (57,000-29,000 years ago), that can be correlated with the last presence of Neanderthals and the subsequent occupation of the site by modern humans. Thus, these sites provide a unique record of human occupation and environmental change in the Late Pleistocene (123,000-10,000 years ago; Section 3.2).

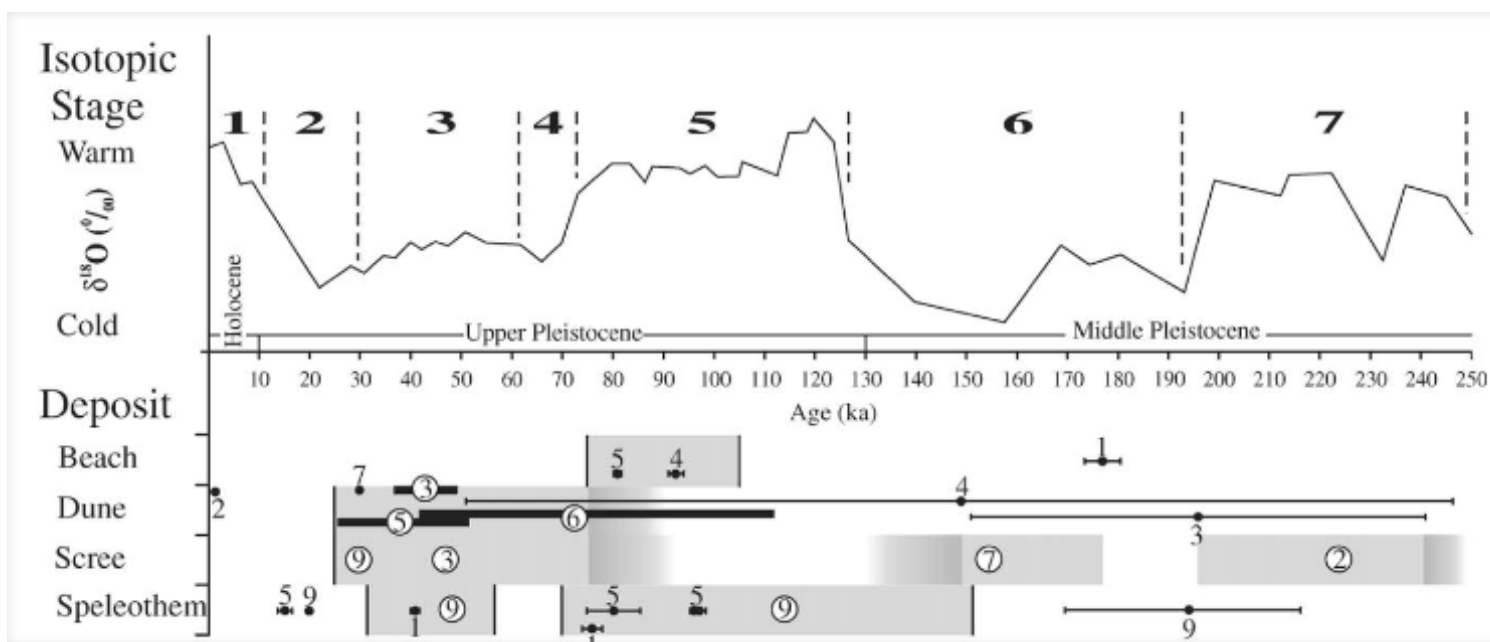
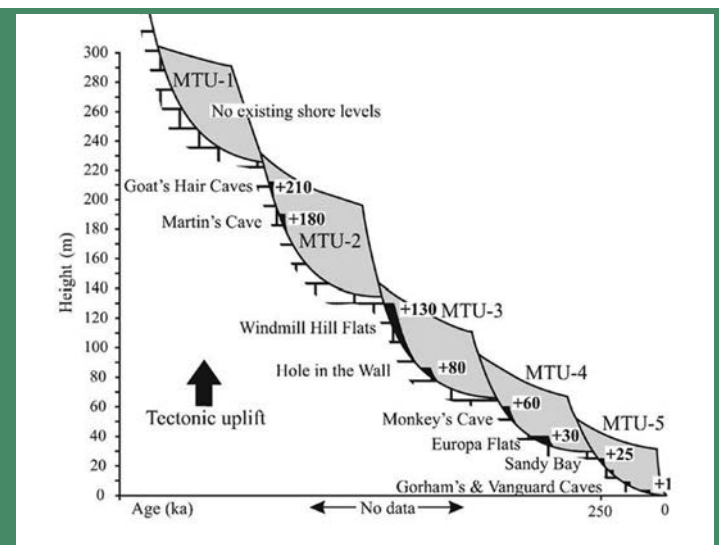


FIGURE 2.13 Dates of sedimentary units on Gibraltar. Sets of dates from a single site are shown by solid black line with a white circle and sequence of dates by number in white circle on grey shadowed band. The dates are compared with the Oxygen Isotope sequence. After Rodríguez-Vidal *et al.*, 2004.

Quaternary sediments have a widespread distribution within the site and are both marine and continental deposits. They include sand and cobble shore sediments, aeolian sands, scree breccias and karstic products, like clays, fallen rocks and speleothems. Tectonic uplift of marine high-stand landforms show raised shorelines stair-cased across the slopes. Detailed geomorphological research indicates that the relationships between beach, scree and dune sedimentary formations form five main morpho-tectonic steps on the Rock, all within the property (Figure 2.14 and Figure 2.15): marine terraces between 1 and 25m (e.g. Gorham's Cave), 30–60m, 80–130m, 180–210m (e.g. Martin's Cave), and features above this level. Each terrace succession and associated slope-aeolian sediments is backed by a steep relict sea cliff along its landward margin, so forming a composite cliff. The cliffs appear much better developed on the eastern side of the Rock, since the littoral erosive processes here are much greater. The higher morpho-tectonic steps are older than lower ones, and probably formed in the Pliocene.

Raised shorelines are represented by marine sediments and landforms and are best developed to the south and east of the Rock, also within the site. Current evidence suggests that there are traces of at least 12 former levels that are now raised above present mean sea level (MSL) at heights of 1–3, 7–9, 15–17, 20–25, 30–40, 50–60, 80–86, 90–130, 180–190, about 210, and possibly 240–250m or even 300m.



**FIGURE
2.14**

Composite cliffs on the south-east coast of Gibraltar, within the nominated property. Each shelf separates a morpho-tectonic unit (MTU) with a complete morpho-sedimentary record. After Rodríguez-Vidal *et al.*, 2004.

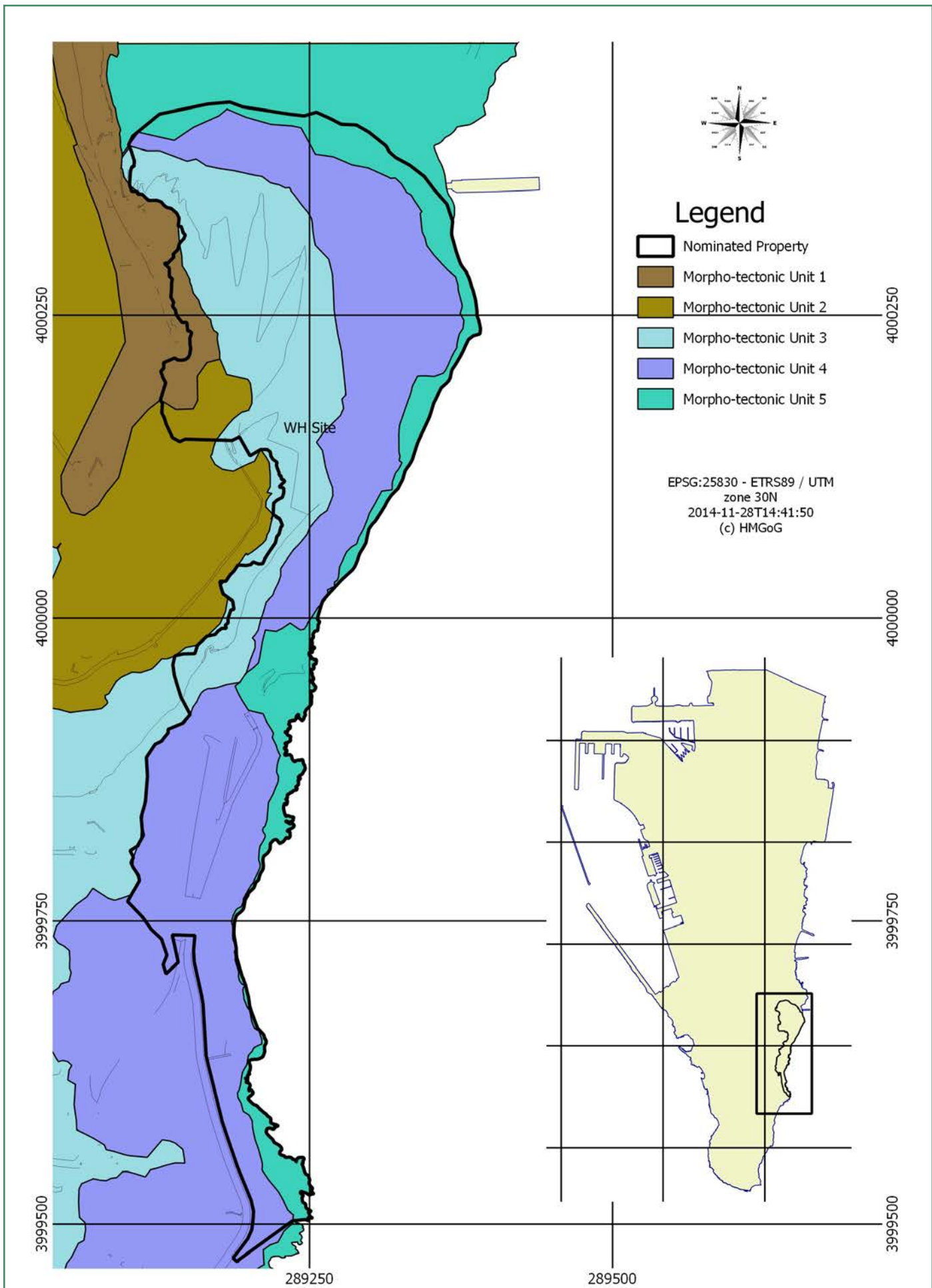


FIGURE 2.15 The nominated property is the only area in Gibraltar that encompasses all the morpho-tectonic units.

There are two prevailing winds in the Gibraltar area: easterly and westerly. The former is by far the stronger. Dunes formed by easterly winds were formed on the Rock during the Quaternary, limited to zones which had a sufficient sand supply. In these sectors large, rampant (climbing) type dunes were built against the steep slopes of the Rock, having originated on a marine beach before being blown inland to accumulate as rampant dunes. During the period represented by the Gorham's, Vanguard and other related cave sediments, as well as the Catalan Bay climbing sand dunes, it was likely that Gibraltar was part of the mainland, with a broad coastal plain covered with wind-blown dunes (Figure 2.16). The Catalan Sands developed between 130,000 and 40,000 years ago, at the same time as the infilling of Vanguard Cave.

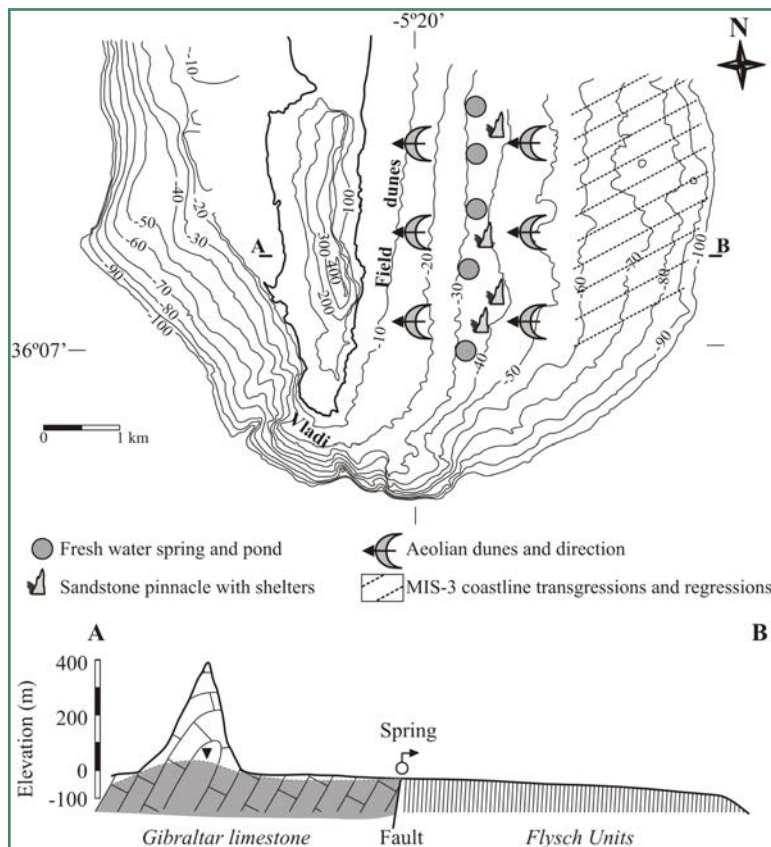


FIGURE 2.16

Present topography-bathymetry of the Rock of Gibraltar and submerged area with the main geomorphological features during Marine Isotope Stage (MIS) 3, between 57,000 and 29,000 years ago. MIS 3 was a period of relative global cooling with lowered sea levels. The Rock contours are at 100m, and the submerged area's at 10m intervals. A-B: E-W schematic section representing the geology and karst hydrology (grey is groundwater). After Rodríguez-Vidal *et al.*, 2013.

Massive slopes of Quaternary scree breccia occur widely on the flanks of the Rock of Gibraltar. They are best developed at the base of the North Face and along much of the east coast (Figure 2.17), dipping gently outwards from the Main Ridge source with a stair-cased disposition. The scree breccias are largely composed of very poorly-sorted angular fragments of Gibraltar Limestone which may be up to several metres in diameter. The angularity, size and shape indicate that they formed under terrestrial conditions, facilitated by slope instability and gravitational processes. Aeolian sand lenses are inter-bedded in the scree breccias. Flemming (1972) observed that along some parts of the south-western coast breccias continued down to 20m depth below sea level. The major scree breccias on Gibraltar appear to be rock fall screes. Scree breccia is not only a climatic deposit but also a product of marine high-stand. The flank of the Rock was eroded by marine action and the scree breccias formed subsequently once the cliffs could not be reached by the sea. The breccia deposits therefore overlay former marine landforms such as beach terraces, cliff and wave-cut platforms, or fill karstic holes and former screes.



FIGURE 2.17 Massive slopes of scree breccia occur on the east coast.

The products of karstic solution are a pervasive feature of the Rock. The sedimentary record of cave infill includes levels of both external and internal provenance, and accumulations of clastic, chemical and organic debris. Allochthonous sediments are aeolian sands, marine boulders and sands, scree and fissure breccias and rill wash silts and sands. The autochthonous sediments are fallen rocks, water-lain silts and sands, bat guano and bones, human artefacts, combustion zone ash layers, organic and phosphatic sediments, and speleothems. It is not unusual to find terrestrial deposits and speleothem sealing the marine deposits in coastal caves (e.g. Gorham's and Vanguard Caves). These caves operate like sediment traps that provide a high resolution Quaternary record.

The steep cliffs which fringe Gibraltar were formed by coastal erosion during periods of relative marine sea level high-stand and still-stand (Figure 2.18). Composite cliffs have more than one major slope. They include bevelled cliffs with convex or straight seaward-facing slopes above steep, wave-cut faces, and multi-storied cliffs with two or more steep surfaces separated by gentler slopes. At Gibraltar, composite cliffs reflect the combined effects of sub-aerial and marine processes and progressive tectonic uplift during the Quaternary. The eastern side of the Rock is exposed to easterly storms from the western Mediterranean. It has a fetch of approximately 1500km. As a result, the eastern side is subject to much stronger littoral erosion, leading to a continuous coastal retreat, while the western side is hardly affected by such a process. Thus the relief of the eastern side, where the site is located, has changed more quickly, giving rise to a great variety of erosional landforms.



FIGURE 2.18 The steep cliffs which fringe Gibraltar were (and still are) formed by coastal erosion during periods of relative marine sea level high-stand and still-stand.

The successive sea-level fluctuations throughout the Quaternary undoubtedly constitute the most important factor determining the morpho-sedimentary evolution of the Rock (Figure 2.19). The most recent slope profiles show a design with two well-differentiated elements: a semi-vertical cliff, and a rectilinear to concave basal slope. The cliff is the product of gravitational processes: collapses and falls associated with intense fracturing of the calcareous mass possibly affected by other secondary processes and factors such as the network of surface-breaking endo-karst conduits, root activity and mechanical weathering. With a stable sea level, these slopes retreat by replacement: the accumulation of debris at the foot is not completely balanced by the removal of sediments by wave action and the height of the cliff diminishes progressively. The head of the slope grows at the same time. The end of the process is reached with a convex-concave profile when the forms, in dynamic balance, evolve very slowly. Thus, a relative sea level rise will have two basic consequences. First, the hillside will tend to acquire a gentler profile. This will be achieved by a progressive accumulation of debris along the base sections of the old slope. Talus deposits can be found fossilized by dunes and beaches, a mechanism recognizable at various points on the northern and eastern coast of Gibraltar. Second, a relative sea level rise will also produce a submerged morphology very similar to that observed by Flemming (1972) with echo sonar, to the east of Gibraltar. In contrast, a relative sea level fall will sharpen the profile, tending towards the former design but starting at a lower height above sea level. Littoral erosive processes will create a cliff edge at the base of the profile that will retreat. The earlier profile will be formed, once more, through gravitational processes. If this new situation is maintained long enough, the original profile could be

FIGURE 2.19

The successive sea-level fluctuations throughout the Quaternary undoubtedly constitute the most important factor determining the morpho-sedimentary evolution of the Rock. In the case of Gibraltar it seems clear that surface weathering and debris falls have been responsible for the retreat of the escarpment.



entirely eliminated and substituted by the new profile. If time is insufficient, the profile will again be preserved at the head of the slope. We therefore observe “hanging slopes” in which the two elements, cliff edge and slope, can be recognized, associated with a sea level that is higher than the present one. This type of morphology is associated with the so-called “composite cliffs”, whose polycyclic evolution is usually related to tectono-eustatic fluctuations and to the different rates of erosional retreat of the escarpments due to wave action. In the case of Gibraltar it seems clear that the surface weathering and debris falls have been responsible for the retreat of the escarpment. Hanging slopes appear much better developed on the eastern side of the Rock where the coastal erosional processes are much more important (Figure 2.19).

2.a.5 The submerged shelf and coastal oases

For the better part of that last glacial cycle, the sea level remained on average 80m below the present sea level, and at the Last Glacial Maximum fell to –120m (Siddall *et al.*, 2003). The landscape of Gibraltar was most affected on the east side of the Rock which is much shallower than to the west, and where a large coastal plain was exposed, extending to up to 5km from the present coastline (Figure 2.16 & Figure 2.20). The emerged coastal shelf harboured many of the biological species, water and lithic raw material resources that were present and were exploited by Neanderthals and modern humans. The plain’s substrate was windblown sands which accumulated against the limestone rock (Figure 2.16). Together, acidic sands and alkaline rocks created a geological ecotone which generated high ecological diversity (Figure 2.21).

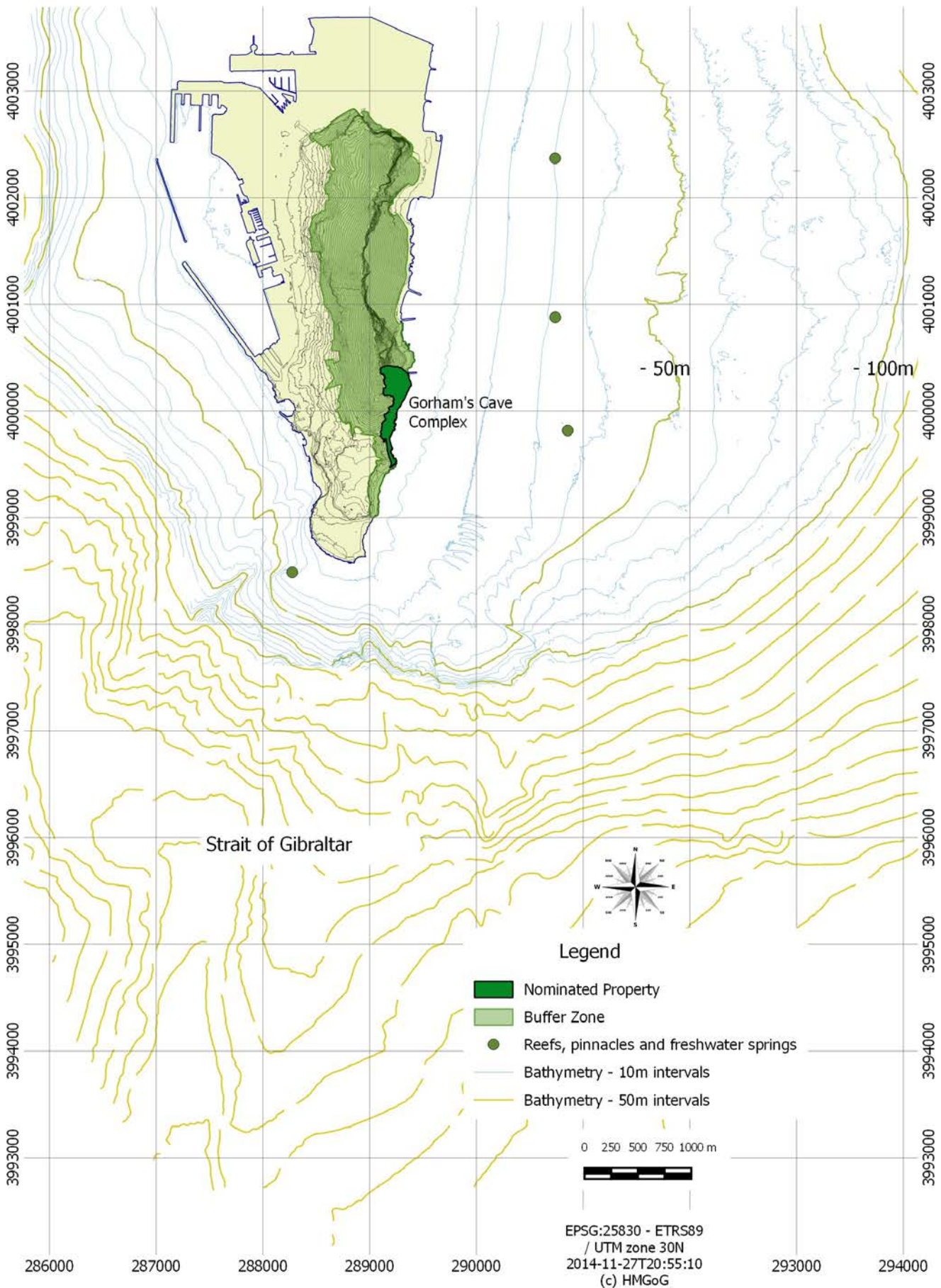


FIGURE 2.20

Gibraltar bathymetry indicating position of -50m and -100m contours. For the greater part of the time that Gibraltar was occupied by Neanderthals and modern humans the coast was located between these contours, reaching -120 m at the last glacial maximum.



FIGURE 2.21 Virtual reconstruction of the coastal plains off Gorham's Cave in the Late Pleistocene based on data retrieved from the caves. Reconstruction: Stewart Finlayson.

The Gibraltar dolo-limestone formation – the Rock - extends offshore as submerged platforms of various depths. To the east it is bound by a Flysch unit with a tectonic contact (Figure 2.16). The seabed to the east of The Rock has a shallower gradient than that recorded in the west. It has a gentle slope continuing over 5km from the eastern edge of The Rock in its widest part. The depth of seabed reaches 100-110m before the slope angle doubles. The plateau represents the footprint of what was once a much larger geomorphological feature.

Vladi's Reef is the name given to the cliffs on the north of Europa Reef (Figure 2.16), a submerged platform off Europa Point, where archaeological work has been carried out by the project "Underwater Archaeological Excavations (GIBRAMAR)" (Figure 2.22). The reef drops from -19m at the top of the cliff to -22m at its northeast limit. Caves are located at the foot of the cliff (Figure 2.23). The Vladi's Reef breccia has proved to be terrestrial in origin, and its late calcrete cementation have been dated to between 34,840 and 36,280 years ago, thus providing direct evidence that these reefs at -22m were above sea level at the time of late Neanderthal occupation of Gorham's and Vanguard Caves.

In addition, several sandstone pinnacles have been identified off the east side of Gibraltar at -30 to -40m. The pinnacles are the tectonic relic of vertical Flysch sandstone strata isolated by the differential erosion of marginal shales. These were rock shelters and potential sites of lithic extraction for Neanderthals and are associated with freshwater springs, veritable MIS 3 coastal oases (Faure, 2002) for humans and fauna (Figure 2.16). Such springs align along the N-S fault contact between the Gibraltar calcareous rocks and the siliceous Flysch Units. During MIS 3, in the presently submerged areas, these springs were probably feeding freshwater coastal lakes and ponds, as is detected in Gorham's Cave.

The last Interglacial is represented on the Rock by several high-stand sea-level deposits, clearly visible in the eastern flank (Figure 2.24). Many pre-existing caves were widened by wave action (e.g. Gorham's and Vanguard Caves), and beach deposits accumulated within them or at the base of the cliffs on the east side. During maximum high-stand, the Rock was isolated from mainland Iberia. Intermediate cold pulses promoted relative sea-level falls, which favoured faunal channels from the mainland to the Rock, occupying narrow coastal lowlands. During this generally warm and humid period dune deposits covered the shore platform and speleothems formed in the caves, in both cases covering previous units.

During sea-level fall and low-stand of MIS 4-2, sea level was always below high-stand heights. Many coastal cliffs became inactive, i.e. affected by terrestrial processes only. The Gibraltar island transformed

into a tombolo, with a permanent isthmus that promoted faunal interchanges, probably accompanied by a stable human occupation (Neanderthals), mostly in caves and shelters at the cliff bases close to where feeding resource were most readily available. Small easterly dunes coming from nearby beaches formed in the bays and entered into certain caves.

The last intensive period of the Catalan Bay climbing dune development was between 50,000 and 40,000 years ago, related to the late filling of Gorham's and Vanguard Caves (Figure 2.25). The period of maximum aeolian activity, when wind-blown sand activity and dune formation were at their peak, was probably linked with the MIS 3 high-stand shoreline, now submerged on both sides of the Rock.

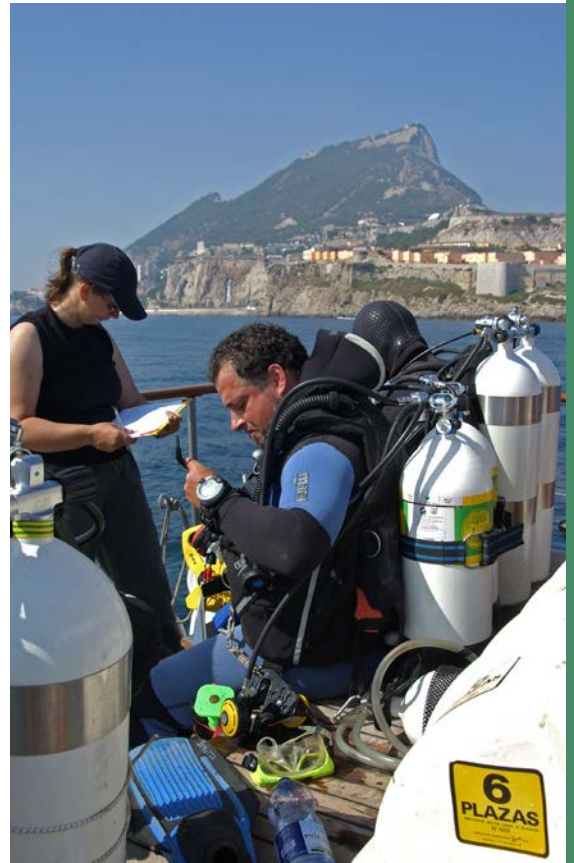


FIGURE 2.22 Submerged archaeology operations during Project GIBRAMAR, south-west of Europa Point .

FIGURE 2.23

Figure 2.23 Schematic sections across Vladi's Reef and Peter Ive's pinnacle. After Rodríguez-Vidal *et al.*, 2013.

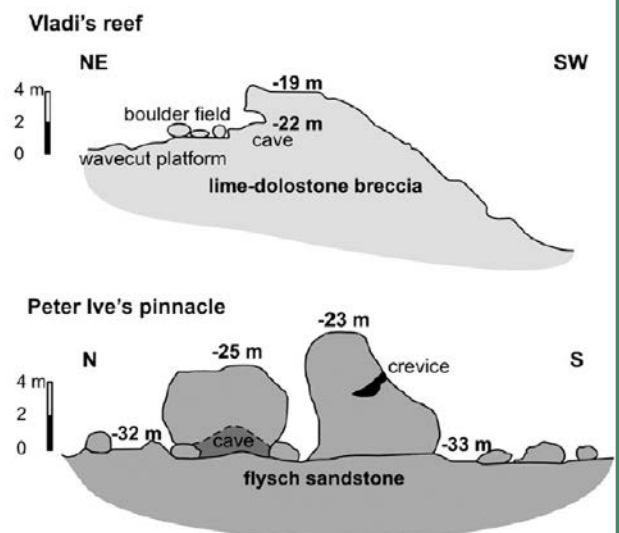




FIGURE 2.24 The Last Interglacial is represented on The Rock by several high-stand sea-level deposits, clearly visible in the eastern flank: a fossilized marine beach of MIS 5 high-stand at the foot of a cliff by Gorham's Cave.



FIGURE 2.25 The last intensive period of Catalan Bay climbing dune development was between 50,000 and 40,000 years ago, related to the latest sandy sediments of Ibex Cave (Figure 1.1), and the late filling of Gorham's and Vanguard Caves. Photograph shows excavation in progress in Vanguard Cave, with aeolian sediments clearly visible.

2.a.6 The Catalan Bay Sand Dune

The various Pleistocene cool events that led to lowering of the sea level off Gibraltar (sub-section 2.a.5) opened up a large sandy plain off the east side of the Rock estimated to have been as large as 25km² (Figure 2.16 & Figure 2.20). As easterly winds blew against the Rock sand dunes accumulated. The Catalan Bay Sand Dune on the eastern side buffer zone (Figure 2.26) is part of this process. In addition, there are smaller fossil dunes at various levels, with the highest recorded being 180m above present sea level, by Martin's Cave off the Mediterranean Steps (Figure 1.1 & Figure 2.10) and within the nominated World Heritage Site.

The Catalan Bay Sand Dune (Figure 2.27) deposits are Pleistocene in their entirety and sections have been dated by OSL to between 95,000 and 130,000 years ago (Rodríguez-Vidal *et al.*, 2007). The dune's last active episodes were around 40,000 years ago. The various fossil dunes on the east side of Gibraltar are a unique testimony of aeolian, typically arid, events of the Mediterranean Pleistocene (Rodríguez-Vidal *et al.*, 2013).



FIGURE 2.26 The Catalan Bay Sand Dune on the eastern side buffer zone, viewed from the ridge above.



FIGURE 2.27 The Catalan Bay Sand Dune on the eastern side is well-preserved and, with the sheer cliffs, protects the setting of the proposed World Heritage Site. Photo shows Gibraltar Restharrow *Ononis natrix ramosissima*, which is a Gibraltar endemic which is restricted to the Catalan Bay Sand Dune.

2.a.7 Palaeolithic occupation sites

Within the Rock itself, 213 caves have currently been catalogued and 46 are within the proposed World Heritage Site. Nine caves and rock shelters within the Rock have evidence of Neanderthals (Figure 2.28 and 2.97). Seven sites within the property include the most significant Palaeolithic deposits; four are representative of the Middle Palaeolithic (Neanderthals) and four of the Upper Palaeolithic (modern humans; Figure 1.2). The four Neanderthal occupation sites – Gorham’s, Vanguard, Bennett’s and Hyaena Caves - included in the proposed World Heritage Site, constitute an exceptionally high density (1.4 caves/10ha). Each of these caves has a sequence of sediments which is largely geological, of great depth and deposited over a great time span. The sediments contain successive levels showing evidence of human occupation in the form of artefacts, processed bones, hearths, rock engravings and paintings.



Gibraltar Neanderthals

FIGURE 2.28 Nine caves and rock shelters within the Rock have evidence of Neanderthals. Ibex Cave, a Neanderthal hunting and butchery site, is situated at the highest point of the Catalan Bay Sand Dune, where it meets the cliffs. Image shows archaeological excavation in progress in 1994.



FIGURE 2.29 Gorham's Cave is a large sea cave, the largest in the complex. The cave has a height of 40m and width of 70m at its entrance and is 127m deep.

Gorham's and Vanguard Caves

Gorham's and Vanguard Caves are the most important caves within the complex. Gorham's is a large sea cave and is the largest (Figure 2.29 & Figure 2.30) with a depth of 92m; at the back of the cave there is a chamber that extends further by 35 m, giving the cave a total depth of 127m. The cave has a height of 40m and width of 70m at its entrance. The depth of archaeological and palaeontological sediments is 18m (Figure 2.30) and the stratigraphic record at Gorham's Cave has revealed that Neanderthals (Figure 2.31) occupied this site between 120,000 and 32,000 years ago (Rhodes, 2012a; Jimenez-Espejo *et al.*, 2013), right to the end of their existence (Finlayson *et al.*, 2006). The sequence of deposits includes occupation levels of low intensity and few artefacts, others with high intensity of occupation including hearths and others that appear unoccupied. Gorham's Cave thus appears to have been occupied intermittently by Neanderthals and hyaenas. The Mousterian (equivalent to the Neanderthals) sequence at Gorham's Cave has been divided into six phases on geological grounds, each with technological subdivisions. The greater part of the sequence in Gorham's (approximately 95% of the deposits) is represented by Neanderthal occupation as is the entire sequence at Vanguard Cave.

Recent re-dating of other sites using new decontaminating techniques suggests that some radiocarbon dates become older than previously estimated, although this is not the case for all sites. The late Gorham's Cave dates are in the process of revision with this new technique to confirm their age. However, it is unlikely that all the existing dates will become older than 40,000 years with the new method. Some are currently as young as 32,000 years and there is a sequence of dates spanning the time frame 32,000-40,000 years ago. The currently-proposed date for the Neanderthal extinction, on the basis of revised dates from a number of sites, is 40,000 years ago. Even if all Gibraltar dates were re-calibrated in the 40,000-year range, they would still represent a late survival site, and the only

remaining question would be whether Gibraltar was part of general pan-European extinction or a much later survival in isolation. The biological evidence (which is independent of dating techniques) clearly shows that the site was a refuge for many species of plants and animals. When this evidence is added to the dating, it is very clear that Neanderthals lived for a long time in the ecologically-rich conditions provided outside Gorham's Cave and that the long sequence is hugely informative about their way of life.

Vanguard Cave complements the Gorham's Cave Neanderthal occupation sequence, spanning the time frame 127,000-75,000 years ago in 17m of sediment (Rhodes, 2012b). This cave has a depth of 41m but may actually be deeper as the sediments currently fill the cave (Figure 2.32 & Figure 2.33). Vanguard Cave has a height of 35m and a width of 35m at its entrance. In addition to the long chronology, Gorham's and Vanguard Caves represent several aspects of Neanderthal behaviour which are ground-breaking.

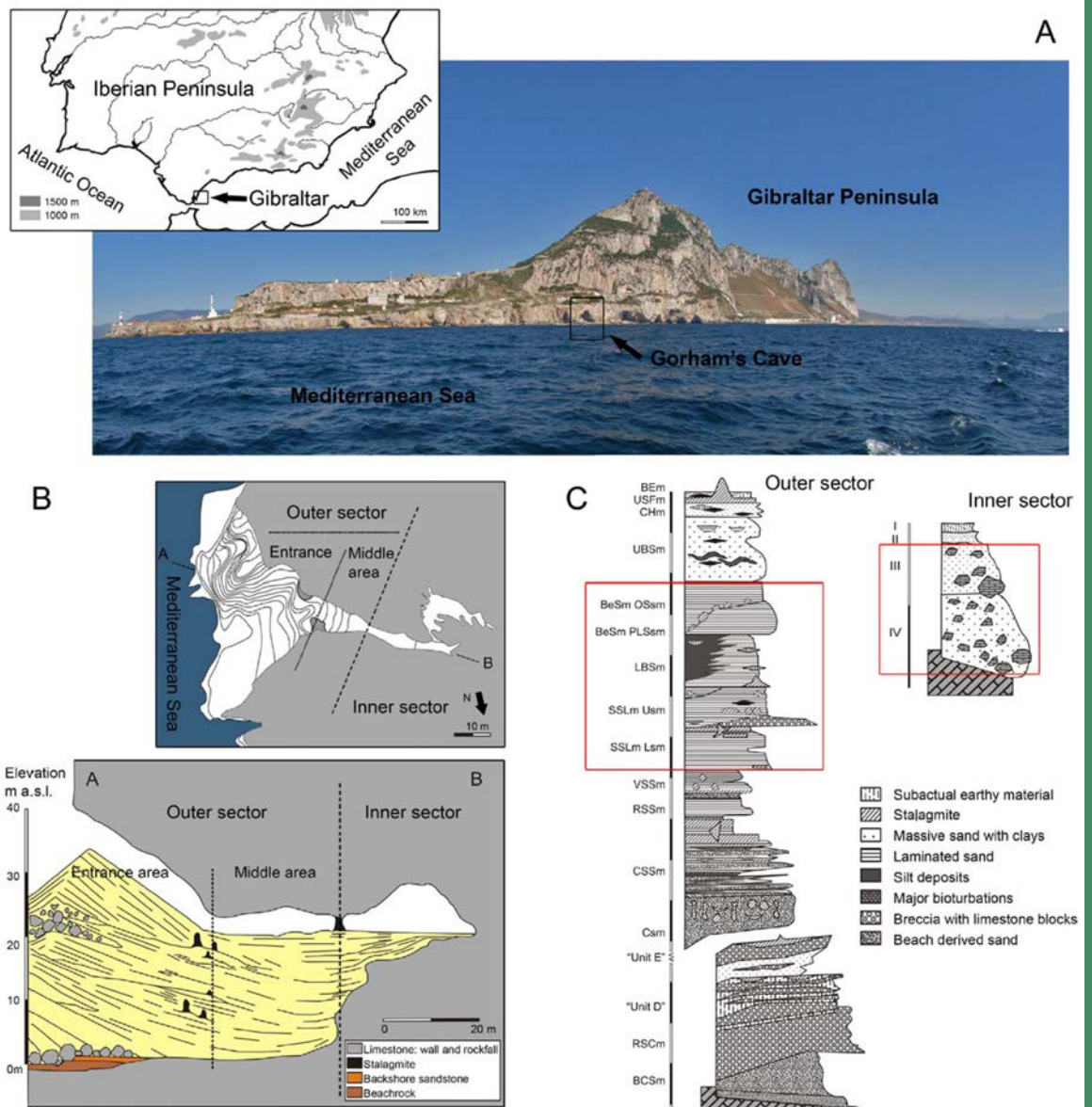


FIGURE 2.30 Stratigraphic section of Gorham's Cave.



FIGURE 2.31 Middle Palaeolithic (Mousterian) technology from Gorham's Cave associated with the Neanderthals.



FIGURE 2.32 Vanguard Cave (left) and Hyaena Cave (right) contain Middle Palaeolithic, Neanderthal deposits.

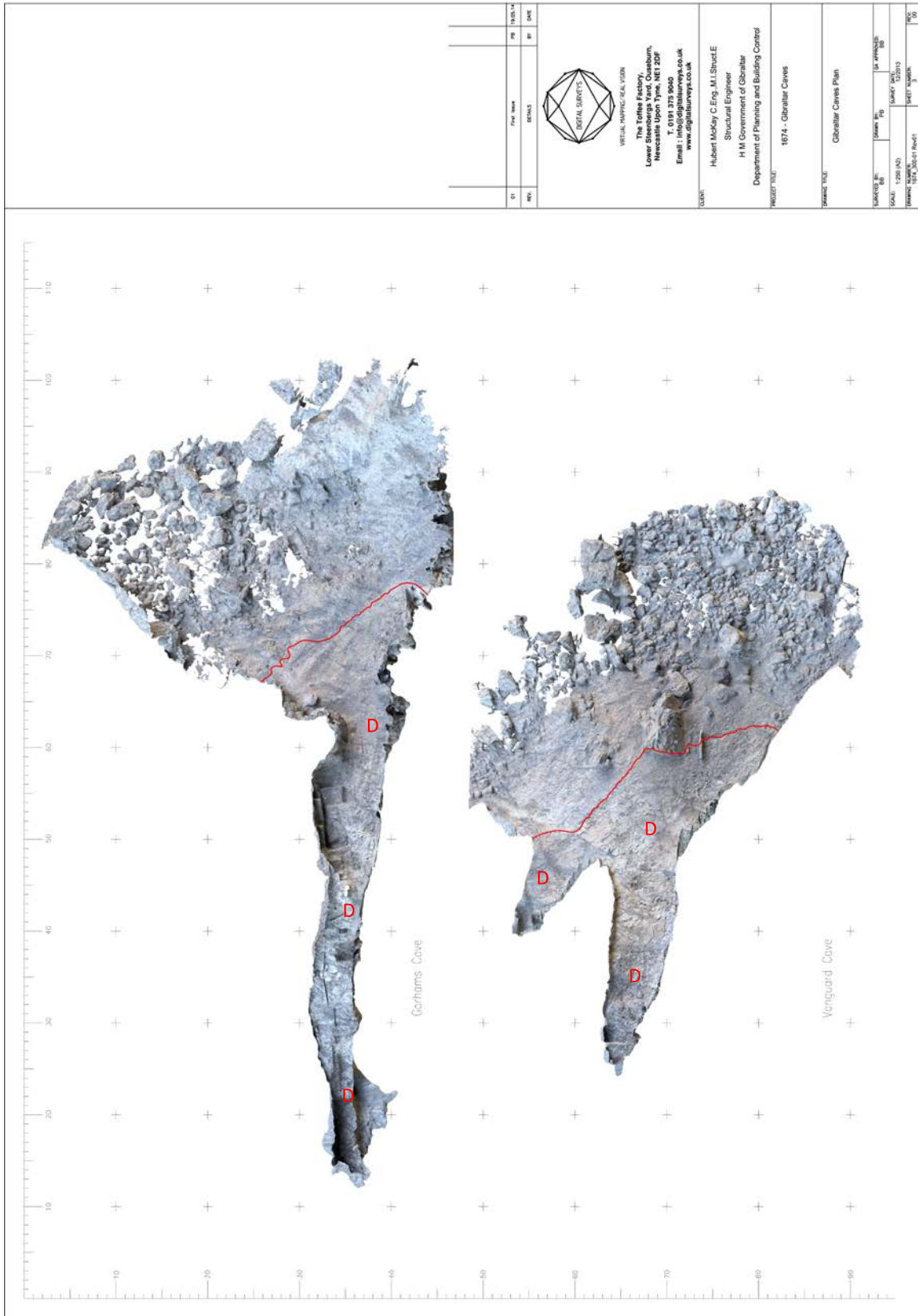


FIGURE 2.33 (a) Plan view of Gorham’s (left) and Vanguard (right) Caves. For each cave the area covered by deposits is indicated by the letter “D”. The limit of the deposits in each cave is marked by a red line. Areas on the side of the line with “D” are deposits; those on the other side of the line (without “D”) have no deposits. Image: Digital Surveys Ltd.

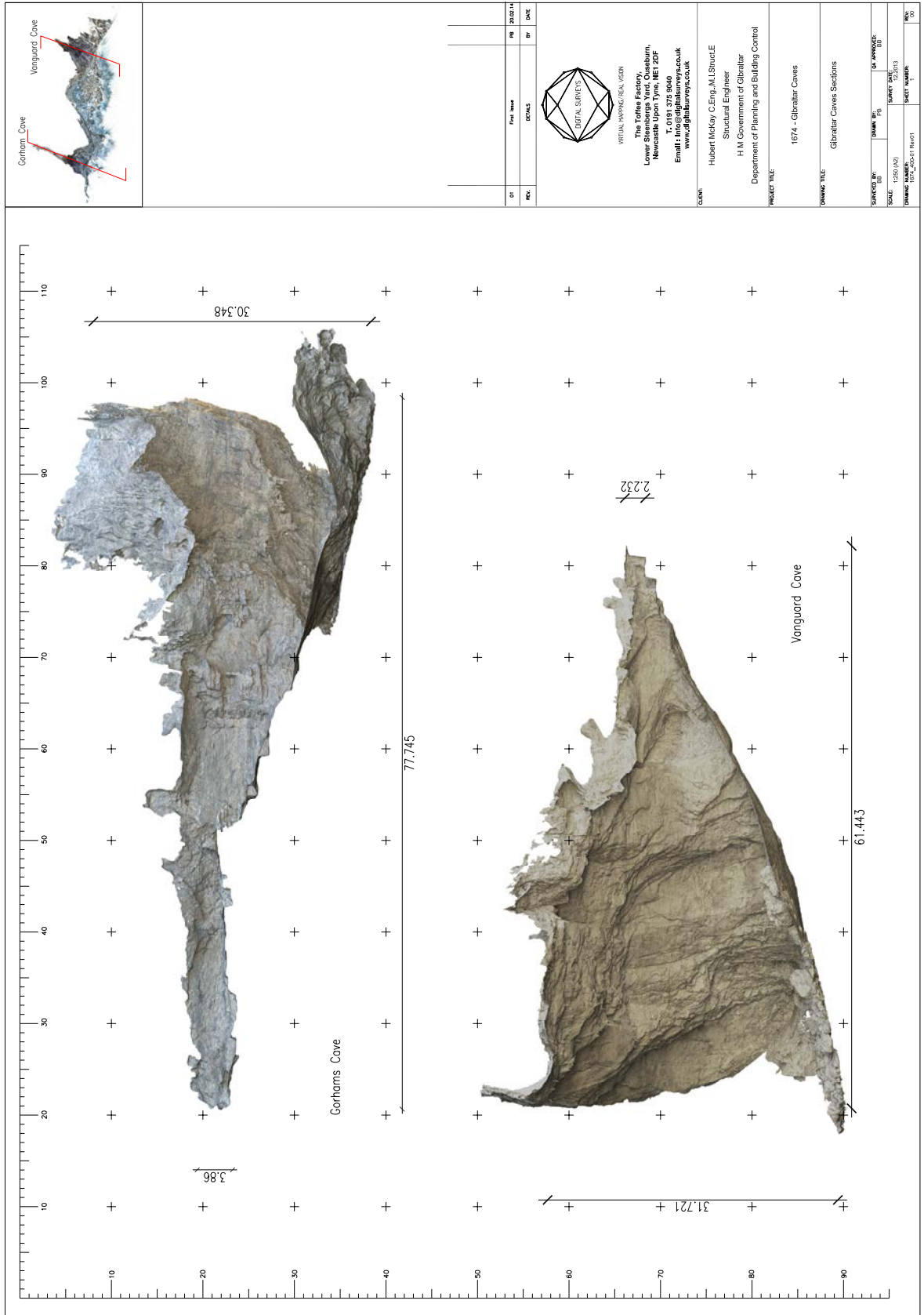


FIGURE 2.33 (b) Section view of Gorham's (left) and Vanguard (right) Caves. Image: Digital Surveys Ltd.

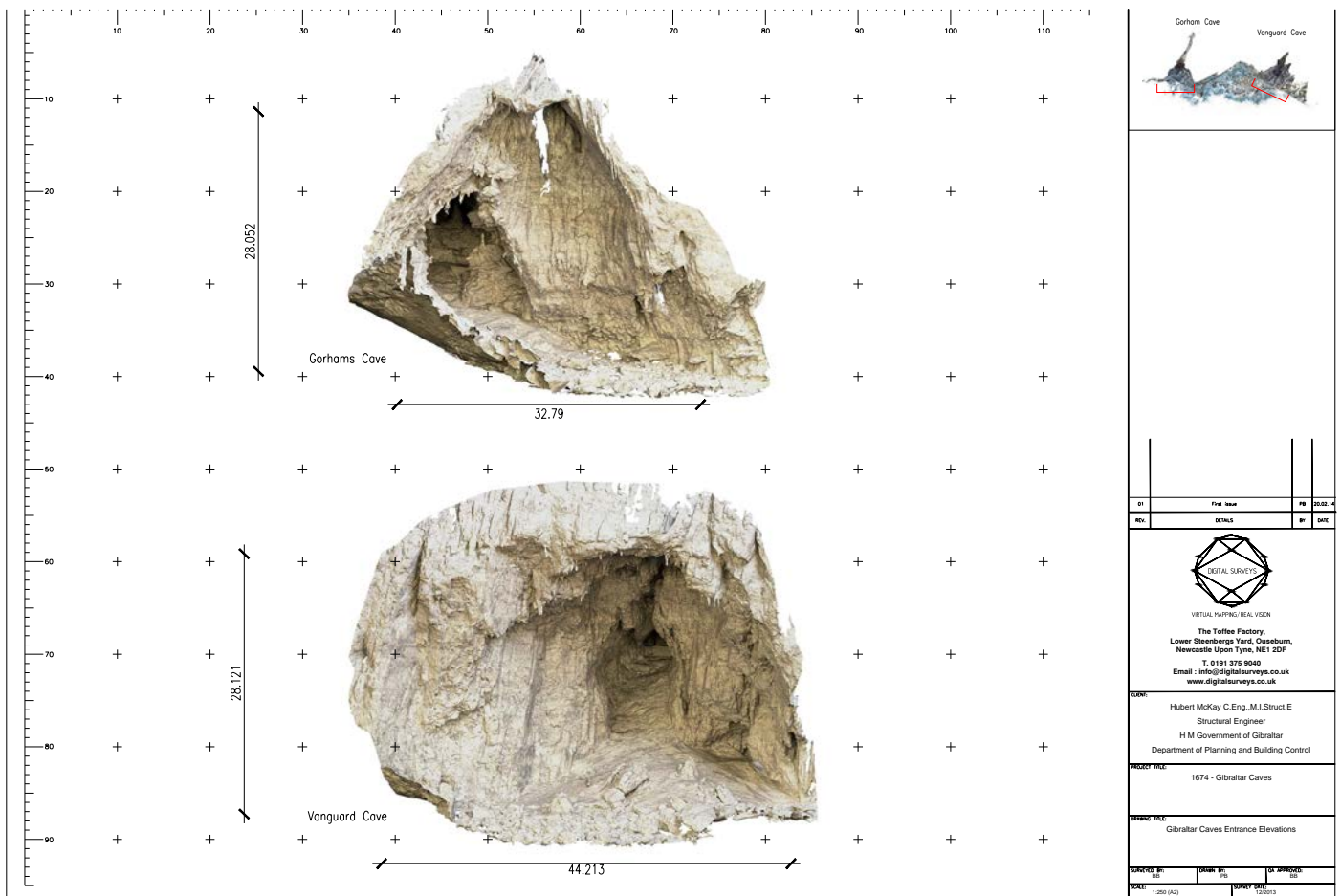


FIGURE 2.33 (c) Frontal view of Gorham's (top) and Vanguard (bottom) Caves. Image: Digital Surveys Ltd.

The Gorham's Cave Neanderthal Engraving

The production of purposely-made painted or engraved designs on cave walls is recognized as a major cognitive step in human evolution, and was considered exclusive to modern humans until the discovery of a rock engraving made by the Neanderthals inside Gorham's Cave (Rodriguez-Vidal *et al.* 2014; Figure 2.34). This is the first and only known example of an abstract pattern engraved by Neanderthals anywhere in the world. It consists of deeply-impressed cross-hatching carved into the bedrock of the cave more than 39,000 years ago. The engraving was made before the accumulation of the Mousterian layer IV inside the cave. Most of the lines composing the design were made by repeatedly and carefully passing a pointed lithic tool into the grooves. This discovery demonstrates the Neanderthals' capacity for abstract thought and expression.

The engraving is located (Figure 2.35) on a flat area at the centre of a 1m² natural platform of the bedrock elevated 40cm over the cave floor. It covers an area of ~300 cm², and consists of eight deeply engraved lines (L1-8) forming an incomplete criss-cross pattern, obliquely intersected by two groups of three (L9-11) and two (L12-13) short thin lines. The engraved pattern strikingly differs from the 1 to 4 cm-deep alteration cracks and other networks of natural fissures present on the exposed surfaces of the fine-grained lime-dolostone of the cave.

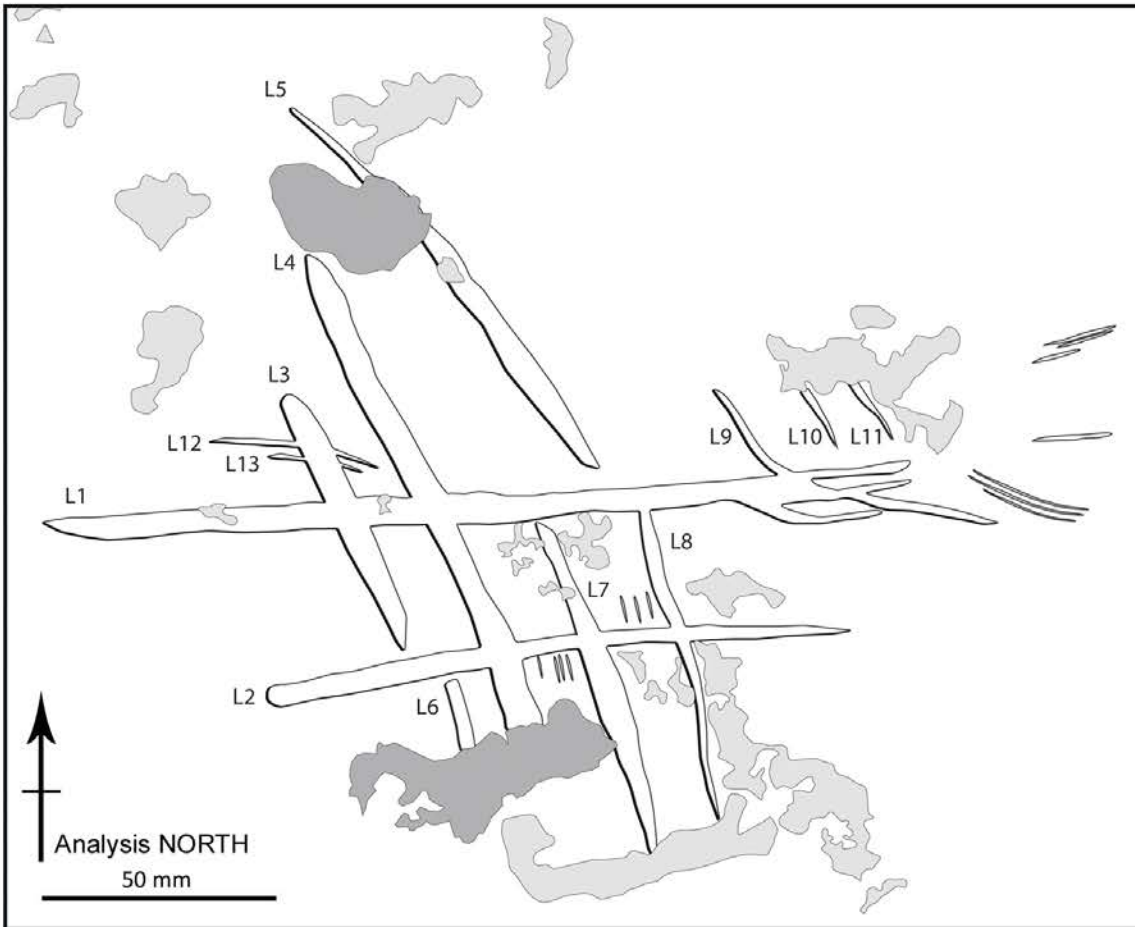


FIGURE 2.34 The Neanderthal engraving at Gorham's Cave.

Three thin layers are identified on the engraved rock surface: a white 2-4mm thick lower layer 1, a light brown 0.5mm thick intermediate layer 2, and an upper black 0.1-1mm thick layer 3. The engraved lines are only covered by layer 3; the unmodified rock surface by all three layers. Mineralogical and elemental analysis revealed marked differences in composition. Layers 1 and 2 contain a substantial proportion of calcite and dolomite coming from the substrate, and neoformation of hydroxylapatite $[Ca_5(PO_4)_3OH]$. Layer 3 is a duricrust composed of Manganese-rich hydroxylapatite $[Mn_2Ca_3(PO_4)_3OH]$. Such differences and micro-stratigraphy indicate that layer 1 is a white alterite, which formed as a result of ancient weathering of the lime-dolostone substrate. It was on this weathered rock surface that the engraving was made. Subsequently, the rock was covered by deposition of archaeological level IV, consisting of blown dust/sand, karstic clay, guano and archaeological remains. As it fell on the sediments, percolating water and bat acidic urine (rich in phosphate ions) altered minerals composing level IV and caused the

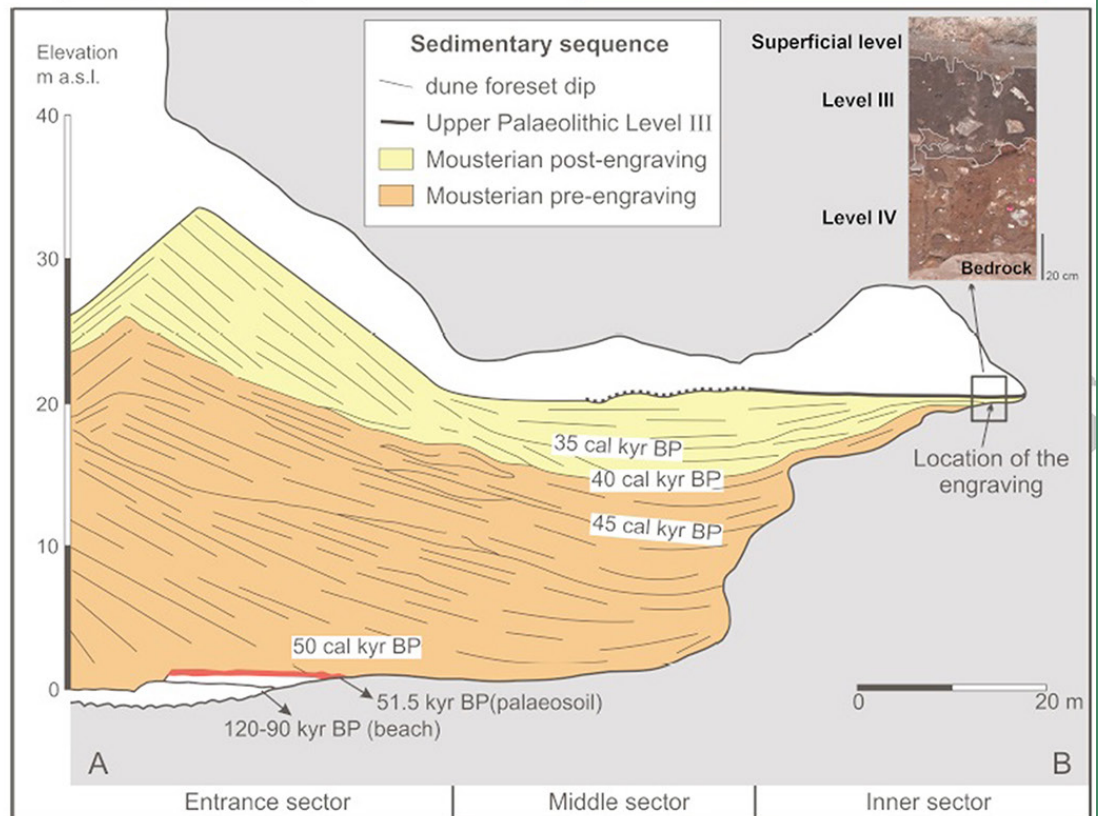
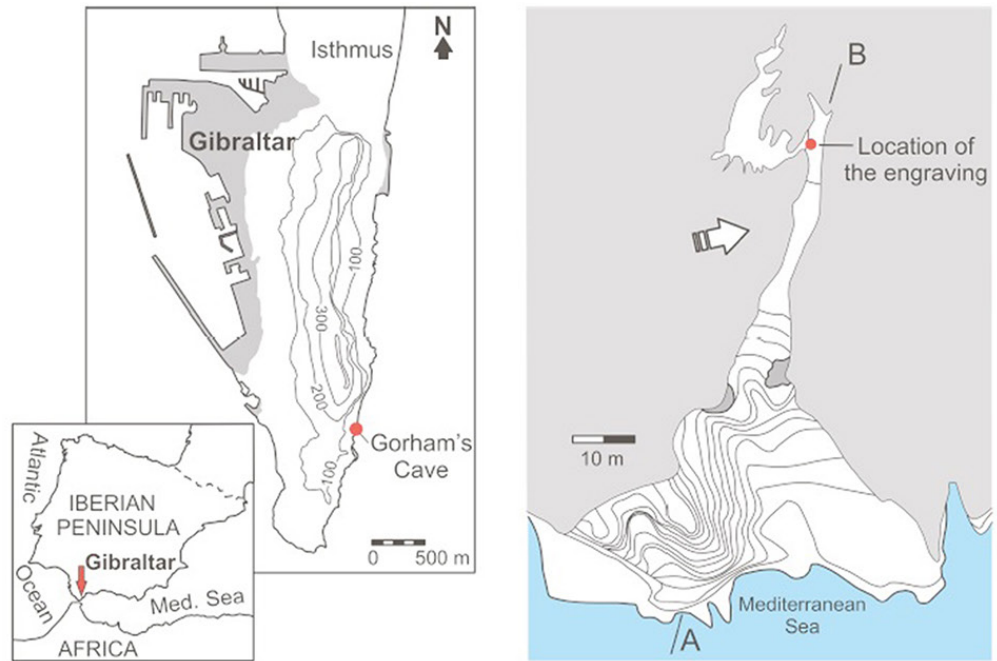


FIGURE 2.35 Map of location of engraving within Gorham's Cave.

migration of cations towards the bottom of this level, at the contact between the engraving-bearing alterite and the sediment. The manganese component of layer 3 probably derives from the decomposition of organic matter present on the surface during the accumulation of stratigraphic level III. This is consistent with the high proportion of organic matter observed in level III and mechanisms proposed to account for the deposition of manganese in cave environments. Epigenesis of the calcareous substrate by phosphorous and manganese rich solutions led to the differentiation of layers 2 and 3 from the top of layer 1. In the engraving where the weathered lime-dolostone composing layer 1 was removed by the engraving process, a slight epigenesis of the rock occurred, forming only layer 3. This type of epigenetic process is responsible for the excellent preservation of the grooves' microfeatures by hardening the bedrock surface; layer 3 has protected the engraving.

Chemical analysis of the duricrust and observation of lime-dolostone weathering patterns due to condensation on the cave wall and bedrock suggests that at the moment in which the engraving was made, the surface of the otherwise extremely hard lime-dolostone was affected by some degree of weathering that facilitated the engraving process. To identify how, and for what reason, the engraved pattern was made the scientists who worked on the engraving: (a) undertook microscopic and morphometric analysis of the archaeological engraving; (b) made experimental incisions with different tools and actions on weathered blocks of lime-dolostone; and (c) produced 3D reconstructions of the whole pattern and individual grooves sections.

Their results showed that the formation of the duricrust preserved the same diagnostic features on the engraving to those documented experimentally when the engraving was reproduced on the same rock type. These features included distinct outlines of groove sections, internal striations produced by contact with protruding asperities of the engraving tool and clues indicating the order of the engravings at intersections. Comparison with experimental engravings shows that L1-8 were engraved with a robust lithic point by repeatedly passing the tool tip into the groove in the same direction; L9-13 were made by single strokes with a similar tool. Striations left on a flat lime-dolostone block when experimentally cutting mammal skin with a stone tool clearly differed from those discovered at Gorham's Cave. According to the experiments, a minimum of 54 strokes with the tool tip were necessary to engrave the widest and deepest line (L4) and between 4 and 30 to engrave each of the other multiple stroke lines. The number of strokes necessary to carve the complete pattern was calculated to between 188 and 317. Such figures must have been even higher if the lime-dolostone was only minimally weathered when the engraving took place. Considerable effort and neuromotor control are necessary to deepen lines on this rock type with multiple strokes without accidentally exiting the main groove and marking the surface adjacent to it or producing fringed terminations. No accidental exits and only a single case of fringed termination, at the end of L1, were detected. Study of line-end morphology, crossings and changes in line direction after intersections revealed that horizontal L1-2 were made first and engraved from left to right followed by L3-8, incised from top to bottom. L1 was deepened by a single stroke at this stage or when L9-11 and L12-13 were engraved. Each of these two groups was consistent with the use of a single tool in one session, from top left to the bottom right. Engraved lines L4-6 are damaged by removal of two potlids that occurred before the formation of the duricrust, suggesting that the engraved pattern remained visible for some time before it was covered by accumulation of level IV and the ensuing creation of the duricrust. This alteration layer was subsequently damaged by desquamations exposing the underlying white lime-dolostone.

The Gorham's Cave engraving represents the first case in which an engraved pattern, not made by a modern human, permanently marks a space within a habitation area in a cave. The oldest radiocarbon dating of level IV, ~39,000 years ago, fixes a *terminus ante quem* for the production of the engraving. Modern Humans were present in western Europe at this time but had still not reached the southern end of the Iberian Peninsula. This argues against the possibility that Neanderthals produced this design under the cultural influence of modern humans and rather argues in favour of independent invention. The engraving at Gorham's Cave represents the first directly demonstrable case in which a technically-elaborated, consistently and carefully made non-utilitarian engraved abstract pattern, whose production required prolonged and focused actions, is observed on the bedrock of a cave. This engraving represents a deliberate design conceived to be seen by its Neanderthal maker and, considering its size and location, by others in the cave.

The first and only known example of exploitation of birds for food by the Neanderthals

Evidence from Gorham's Cave shows, for the first time, that the association between humans and Rock Doves (Figure 2.36) was an ancient one with its roots in the Palaeolithic predating the arrival of modern humans into Europe (Blasco *et al.*, 2014). This is exceptional evidence because the regular hunting of birds for food had previously been considered the exclusive domain of modern humans. At Gorham's Cave, Gibraltar, the Neanderthals exploited Rock Doves for food for a period of over 40,000 years, the earliest evidence dating to at least 67,000 years ago. The exploitation was not casual or sporadic, as repeated evidence of the practice was found in different, widely-spaced temporal contexts within the cave. The results point to hitherto unappreciated capacities of the Neanderthals to exploit birds as food resources on a regular basis. More so, they were practising it long before the arrival of modern humans and had therefore invented it independently.

1,724 Rock Dove bones from Gorham's Cave, spanning the time range from 67,000 to 28,000 years ago, were examined. This temporal range coincided with the occupation of the cave by Neanderthals and, subsequently, by modern humans. Twenty discrete archaeological units were examined taphonomically. Nineteen of these contexts were associated with Neanderthals and one with modern humans. Evidence of human intervention on Rock Dove bones was found in 11 (57.89%) of the Neanderthal contexts, as well as in the modern human context. There was no observable difference in the



FIGURE 2.36 Rock Dove remains from Gorham's Cave.

tendency of damaged bones between Neanderthals and modern humans, both of whom appeared to have regularly processed Rock Doves, presumably for food. In the case of the Neanderthal occupation units, cut-marks were detected on 28 dove bones. After skinning or feather removal, direct use of hands and teeth would be the best way to remove the meat and fat/cartilage from the bones. The proof of this came from human tooth-marks and associated damage observed on some dove bones. These imprints and alterations result from disarticulation and/or direct consumption (bone breakage by overextension, e.g., arrachement and peeling) (Figure 2.37).

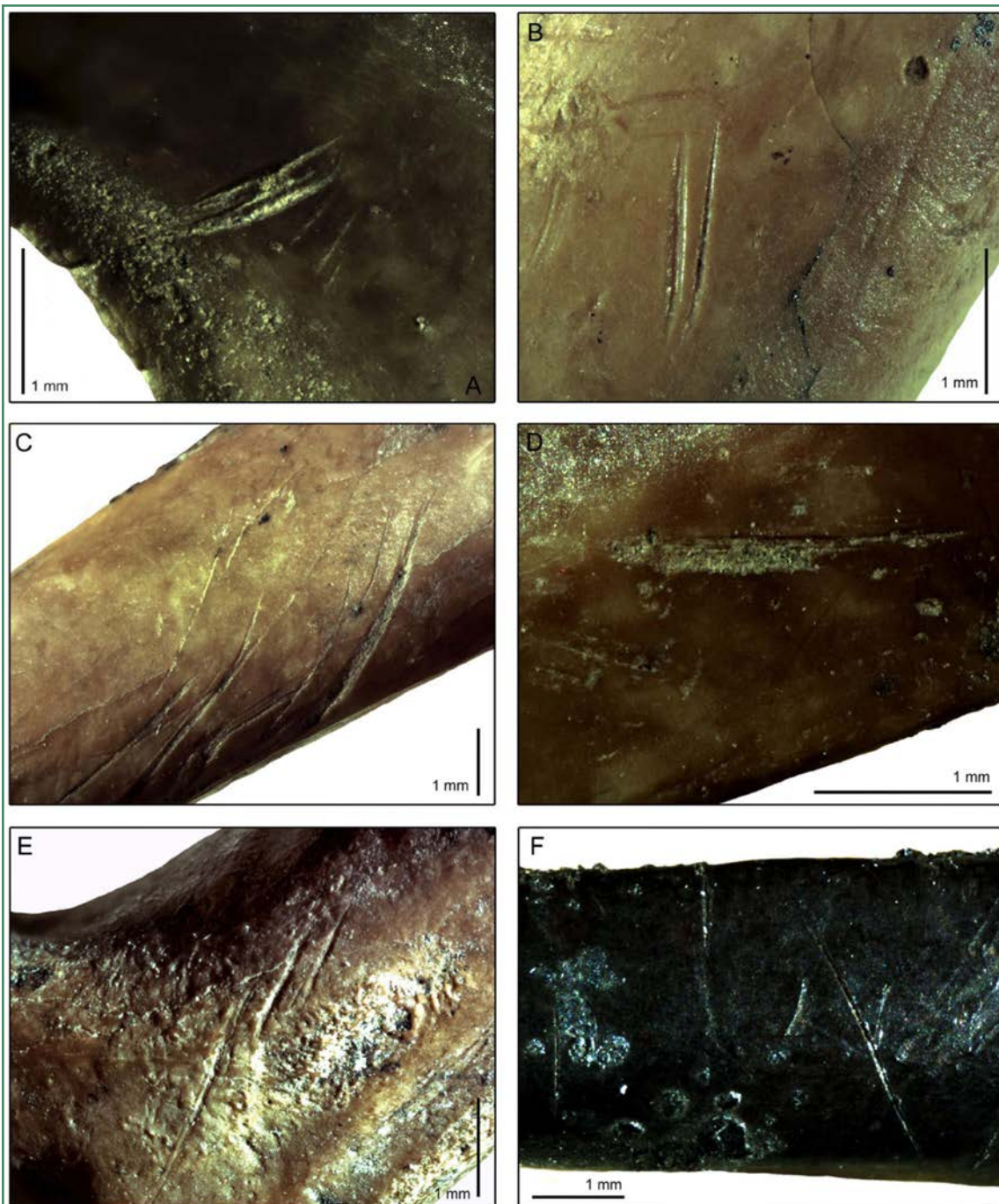


FIGURE 2.37 Bones of Rock Doves with cut marks and evidence of burning.

In addition, a proportion of the bird specimens showed signs of burning, some of them with double colouring evidence. The latter alterations are due to the fact that the entire surface of the bone would not have been exposed to fire with the same intensity. This happens when the prey or portions of it (skinned or not) are placed on a fire for roasting; the areas of the bone that have no meat on them, or only a very thin layer, are affected by the heat more intensely, and therefore the degree of cremation observed in these areas is higher. On the contrary, the bone areas covered with large muscle mass remain unchanged or are changed only slightly, acquiring lower degrees of colouring. At Gorham's Cave, the double colouration on the dove bones coincides with the areas of the skeleton with low muscle mass. In contrast, modifications by other agents, such as carnivores, were negligible.

These results demonstrate unequivocally that Neanderthals, and later on modern humans, consumed Rock Doves. Furthermore, this was not an isolated or casual behaviour as it affected a significant number of individual doves over a long time period. It points to the origin of an association, within the context of caves, which has persisted to the present day. Until these discoveries, the systematic exploitation of birds had been considered to be an exclusive and defining feature of modern human behaviour, although recent evidence had also pointed to the regular exploitation of raptors and corvids (for feathers) by Neanderthals in Gorham's Cave.

The first and only known example of exploitation of marine, alongside terrestrial, mammals for food by the Neanderthals

In recent years, studies focusing on Neanderthals have been providing a different perspective of their subsistence and hunting strategies. Studies of their diet based on carbon and nitrogen stable isotopes show that Neanderthals, in addition to occasional scavenging, were also active hunters on a regular basis. Palaeontological studies of Neanderthal occupation levels reinforce their capability of hunting a wide variety of fauna and show no evident differences from Upper Palaeolithic modern human hunting behaviour. The Gibraltar sites reinforce this hypothesis having provided the first and, to date, only evidence that Neanderthals were exploiting marine mammals. Within Gibraltar, the indications are that Neanderthals had knowledge of the geographic distribution and behaviour of their prey. They exploited not only intertidal molluscs, but also seals, dolphins, and fish, through a wide time span (Stringer *et al.* 2008). Subsequent Upper Palaeolithic human levels of occupation in Gorham's show behaviour similar to that of Neanderthals and similarly complex subsistence strategies that allowed them to exploit marine resources.

The upper units of Vanguard Cave (unit B; Figure 2.38) contain a well-defined layer of ash associated with marine shells, dominated by mussels of the species *Mytilus galloprovincialis*, likely from a nearby estuarine source, and a hearth and a concentration of knapping debris and Mousterian stone tools, providing clear evidence for the exploitation of marine molluscs by Neanderthals. This occupation level represents a short period, and it records several activities in the life of the Neanderthal occupants. These activities consisted of selection and collection of molluscs, transport of the gathered mussels to the cave shelter, fire making in the cave, the use of heat to open the shells, consumption of these molluscs, knapping on the hearth embers, and subsequent abandonment of the site. This layer increases our knowledge of food availability and behaviour of Neanderthals, showing the use and selection of marine resources.

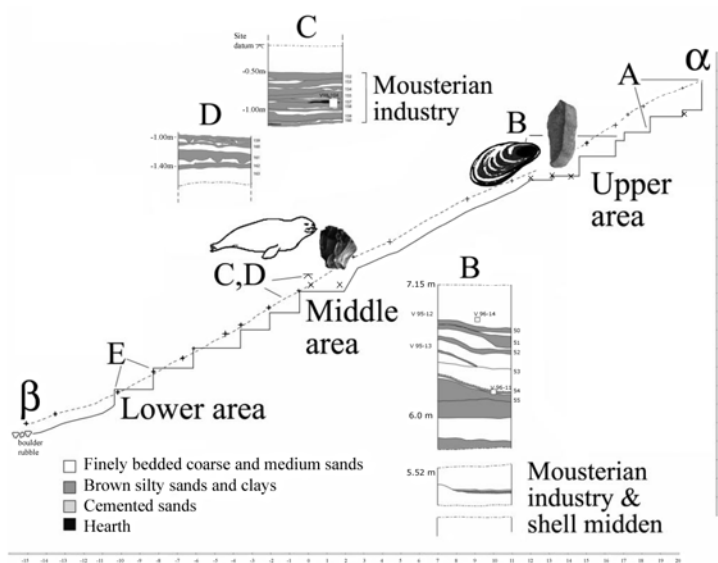
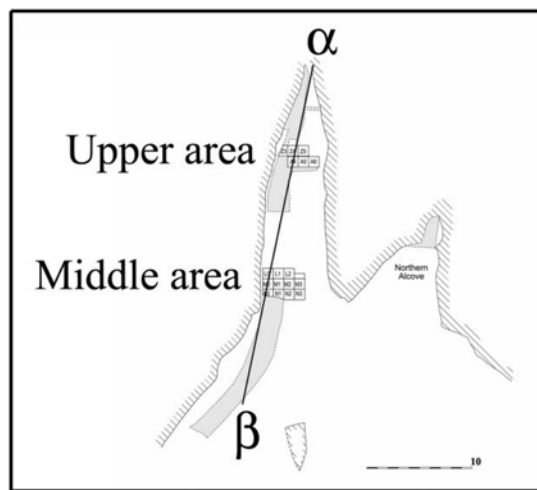


FIGURE 2.38 Section of Vanguard Cave showing location of marine mammal finds and shell middens. After Stringer *et al.* (2008).

Lower in the cave sequence (units C and D) is a series of well-defined occupation horizons that contain a central hearth and considerable quantities of bones and Mousterian discoidal core technology artefacts as well as further evidence of the exploitation of marine resources by Neanderthals. The excavation covered an area of 12m² at the front of the cave entrance. The hearth has shown micro-geomorphological evidence of being reused at least three times. A rich species composition of terrestrial mammalian taxa such as ibex (*Capra pyrenaica*), red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), and bear (*Ursus arctos*), together with marine mammals (seals and dolphins), molluscs, birds, tortoise, and fish has been recovered from these units. As well as all terrestrial mammalian taxa, two marine mammal fossils show human-induced damage, both of them monk seal (*Monachus monachus*; Figure 2.39).

The other Vanguard marine mammals do not show clear evidence of human modification, but they are mixed with terrestrial mammal remains that do and are clearly within Neanderthal occupation horizons. Two groups of cut marks can be distinguished on a proximal phalanx from the hind limb: one of short and deep marks on the lateral side, transverse to the length of the bone, and the other formed by three parallel cut marks, again transverse to the long axis of the bone, on the ventral side. The fracture on the proximal end of the phalanx shows slight peeling on the broken edge as a result of bending the bone, consistent with disarticulation and detachment from connected muscles and tendons. The juvenile scapula of *M. monachus* shows a set of long and thin cut marks, divergent from each other and located near the centre of the medial surface. The distribution and shape of cuts on the scapula suggest defleshing activity. These anatomical elements found in Vanguard Cave were probably not taken arbitrarily by Neanderthals and may reflect primary access to carcasses.

The area excavated in Vanguard Cave is thought to correspond to a zone in which primary butchery was undertaken of carcasses brought to the site. The hearth found at these levels was not used to cook but to prepare the carcass. Reddish-brown

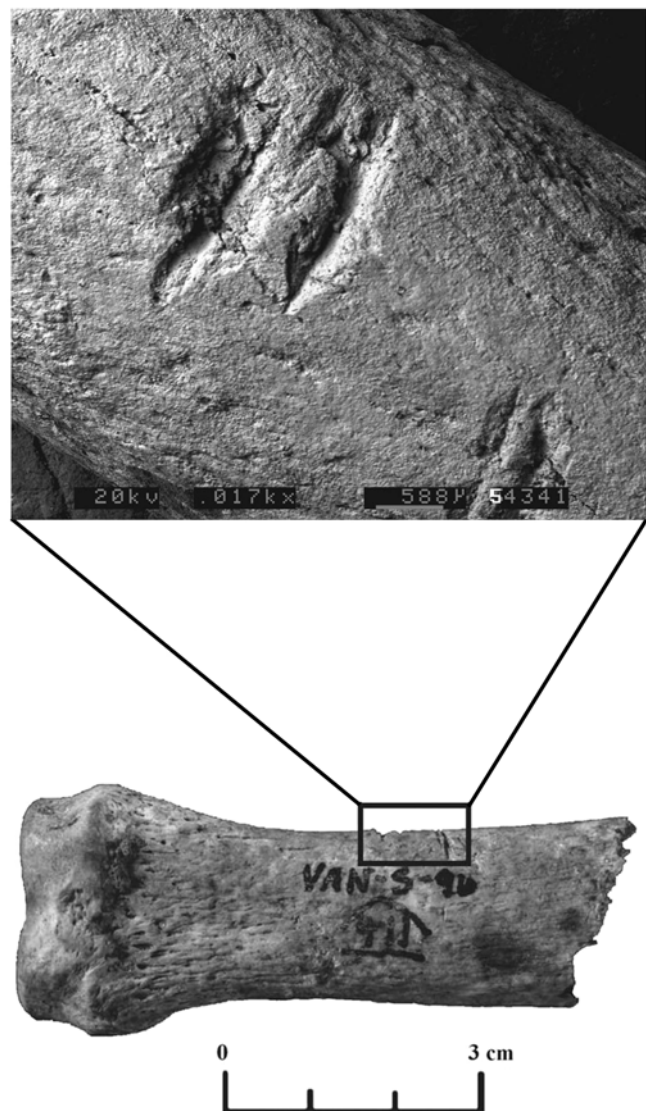


FIGURE 2.39 Monk seal bone with cut marks from Vanguard Cave.

stains are dispersed on the bone surface of monk seals and on terrestrial mammalian bones as well, such *Cervus elaphus* and *Capra pyrenaica*. Experimental work has shown that these dispersed stains on the bone surfaces appear when bones are directly exposed to fire (free of meat and skin), and breakage becomes much easier when bones have been heated, and more advantageous as well, because the marrow solidifies and can be easily removed. Bones previously exposed to fire and then broken have a characteristic type of breakage (mixed fracture angles, opposite to oblique, on spiral breaks).

Both marine and terrestrial fossils in units C and D at Vanguard Cave represent immature individuals (64%); no diagnosable old individuals of any species have been recovered. With regard to marine mammals, this finding would suggest seasonal hunting practices at a time when seals would be vulnerable because of their need to breed on land. Dolphins can be accidentally seasonally beached on the seashore, which may explain their occurrence in the archaeological deposits. The high fat content of these mammals attracts human exploitation but also facilitates rapid decay, and this may explain the lack of cut marks on dolphins if Neanderthals were obtaining fat rather than meat. Spatial distribution of this fossil assemblage and refitting of bone fragments seem to distinguish at least three episodes. Terrestrial and marine mammals, shellfish, and fish are present during all three. Marine mammals are in general scarce at the 12m² excavated at the cave entrance facies of Vanguard Cave. The highest relative abundance of marine mammals appears in the uppermost episode, whereas molluscs are more abundant in the lowermost one. Immature marine mammal individuals are recorded during all three episodes. The time span represented by the gaps between occupation episodes is unknown. However, each episode seems to be relatively short as indicated by a long vertical distance, although terrestrial mammals as part of food discard are relatively abundant. This suggests that Neanderthals, like other humans exploiting coastal habitats, regularly needed to survey the shoreline to locate stranded carcasses or vulnerable individuals.

Almost half of the fossil bones display human-induced damage (stone tool marks, impact marks while opening the bone for marrow extraction, evidence of burning) affecting ibex, red deer, wild boar and seal, whereas 3% of these fossils (mainly ibex and a middle-sized artiodactyl, possibly red deer) have tooth marks made by carnivores. Carnivore fossil bones (including bear) have no damage produced by humans or other carnivores. Evidence of carnivore damage is thus almost negligible; it is absent among marine mammal fossils, and the scarce chewing marks are located in areas and anatomical elements that are not consistent with first access to carcasses, but rather with scavenging. Carnivore tooth marks appear on the tibia, radius, scapula, mandible, and phalanx and are mainly grooves on bones previously exposed to fire (at an incipient stage of burning). Given the lack of evidence of other biological agents (carnivores) or post-depositional/geological disturbances (e.g. storms, water streams) that could bring these marine fossils to the site, we infer that the remains of marine mammals result from Neanderthal transport and activity.

At Gorham's Cave, marine mammals have been found at the bottom of level IV, associated with a Mousterian industry. The age of these marine mammal remains can be assigned to approximately 39,000 years ago. At level III, seal remains were recovered from the top of the series together with Upper Palaeolithic technology.

Comparison between level IV (Mousterian) and level III (Upper Palaeolithic) shows almost no differences in faunal diversity. Most species are present in both levels, and at Vanguard Cave, with terrestrial mammals that include red deer, ibex and horse, and marine mammals such as phocids. An exception is observed with rhinoceroses and suids, absent in level IV at Gorham's. However, this could be the result of sampling error because suids and rhinos (*Stephanorhinus*) were present at Vanguard Cave and in lower horizons at Gorham's Cave. As in Vanguard, the Gorham's large and small game assemblages record clear human activity throughout: stone tool-induced modifications with cut marks consistent with butchering/filleting purposes, breakage to extract the marrow (hammerstone anvil, impact and percussion as well as conchoidal scars) and disarticulation at the joints (peeling, chop marks and sawing marks). Mixed fracture angles on spiral breaks have also been observed on these fossils, suggesting that bones were heated and then broken. Carnivore damage is almost absent, and post-depositional taphonomic modifications are very similar between the Middle and Upper Palaeolithic levels. Evidence of re-working or even re-sedimentation was not observed at any level.

Vanguard Cave shows that Neanderthals were not only systematically exploiting terrestrial mammals but also marine molluscs, and also scientifically-demonstrated for the first time, pinnipeds and cetaceans. Their distribution through the stratigraphy suggests that securing marine mammals was not an accidental or isolated practice, but a focused behaviour possibly repeated seasonally or over longer periods. Furthermore, at several Gibraltar Middle Palaeolithic sites, coastal wildfowl and seabirds (e.g., the Great Auk *Pinguinus impennis*) were also likely to have been exploited by Neanderthals. Significantly, the range of species exploited and the age distribution pattern of the prey strongly indicate that the coastal exploitation of resources by Neanderthals was not a sporadic and isolated occurrence but one that required a knowledge of the life history of prey and its seasonality.

Neanderthal exploitation of raptors and corvids for their feathers

The hypothesis that Neanderthals exploited birds for the use of their feathers or claws as personal ornaments in symbolic behaviour is revolutionary as it assigns unprecedented cognitive abilities to these hominins. This inference had, however, been based on modest faunal samples and was thus thought that it might not represent a regular or systematic behaviour. In 2012, work in Gorham's and Vanguard Caves changed the view by providing a detailed taphonomic association between Neanderthals and corvids-raptors (Finlayson *et al.* 2012). A clear, previously unknown, long-term association between Neanderthals, raptors and corvids was shown for the first time (Figure 2.40). The association involved the direct intervention of Neanderthals on the bones of these birds, which was interpreted as evidence of extraction of large flight feathers. The large number of bones, the variety of species processed and the different temporal periods when the behaviour is observed, indicated that this was a systematic, temporally broad, activity that the Neanderthals undertook, providing clear evidence that Neanderthal cognitive capacities were comparable to those of modern humans, and constituting a major advance in the study of human evolution.

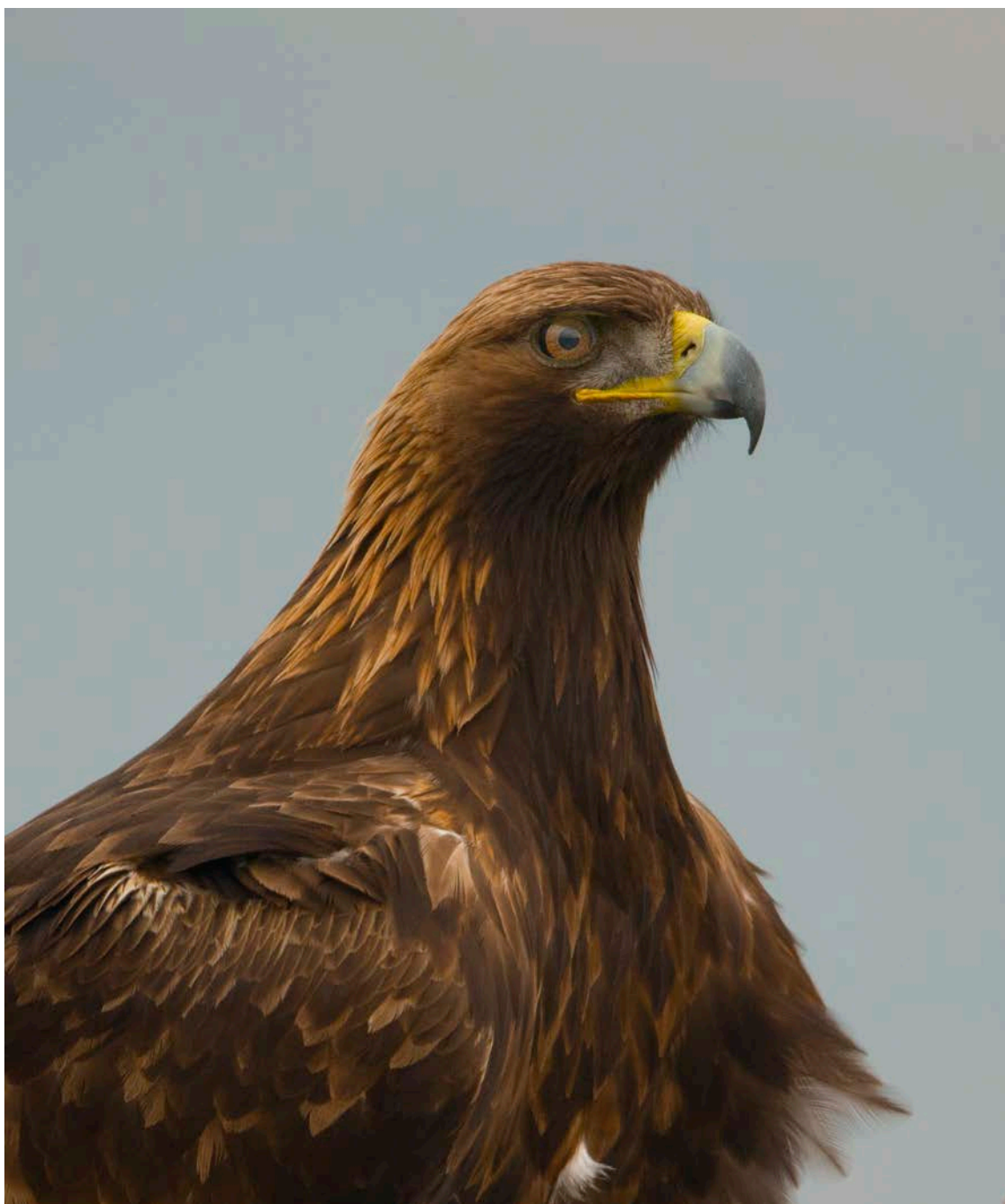


FIGURE 2.40 The Golden Eagle *Aquila chrysaetos* is among the species taken by the Neanderthals for its feathers.

A total of 604 skeletal elements (NISP) from 21 species of raptors, falcons and corvids was examined. They included Golden Eagle *Aquila chrysaetos*, Griffon Vulture *Gyps fulvus*, Black Kite *Milvus migrans*, Red Kite *M. milvus*, Carrion Crow *Corvus corone*, Red-billed Chough *Pyrhocorax pyrrhocorax* and Alpine Chough *P. graculus*. These NISP were distributed into 486 from Gorham's Cave, 91 from Vanguard Cave and 27 from Ibex Cave (a rock shelter in the eastern buffer zone).

Thirty-three of the 604 elements (5.46%) showed cut-marks made by Neanderthal stone tools (Figure 2.41); 18 (2.98%) showed bone breakage in fresh state; three (0.49%) had been burnt; and one had human tooth imprints. In addition, nine of 201 ulnae and humeri (4.48%) showed evidence of over-extension (arrachement and peeling). The skeletal elements represented a minimum number (MNI) of 124 individuals. Of these, at least 18 individuals, of the seven species listed above, showed evidence of direct Neanderthal action on them. The nature of the

observed evidence of such action was interpreted as evidence of feather removal. In contrast, modifications by other agents, such as carnivores or rodents, were negligible. Only 2.3% of all the elements showed marks by carnivore gnawing; 0.5% showed marks by rodent gnawing; and 0.66% showed damage due to digestive action by birds of prey.

The sample examined showed a clear bias of wing bones over other skeletal elements (Goodness of Fit, $G^2=985.4379$, $p=0.0001$). Thus, 337 of the 604 (55.7%) bones were wing bones, compared with 184 leg bones (30.46%) and only 83 (13.74%) from the axial skeleton.

The results from the Gibraltar caves are striking because, given the number of NISP, MNI, species and bias towards wing elements, they reveal that the processing of bird bones by Neanderthals was not random and accidental but a regular behavioural activity. This activity was clearly related to the extraction of the largest, most durable, and arguably most visually striking, elements of a bird's plumage. The conclusion that this was a systematic behaviour was strengthened by the fact that evidence for the practice was found in three caves and different stratigraphic levels in a single cave (Gorham's).

Additionally, these levels covered a large part of Marine Isotope Stage (MIS) 3 between 57,300 and 27,820 years ago, all associated with Neanderthals and all predating the arrival of Modern Humans in the area. An occasional use of birds for food could not be ruled out as evidence of burning, human toothmarks and cut-marks on coracoids, humeri, tibiotarsi and tarsometatarsi have been observed. These could be a response to a subsequent secondary action and are minor in comparison to feather extraction.

That Neanderthals shared this uniquely-human trait of feather ornamentation with modern humans, provides a further bridge that brings them closer to each other. Discussion of the cognitive abilities of the Neanderthals has a protracted history which came to the fore with the debate on whether ornamentation found associated with Neanderthals in France was autochthonous or was

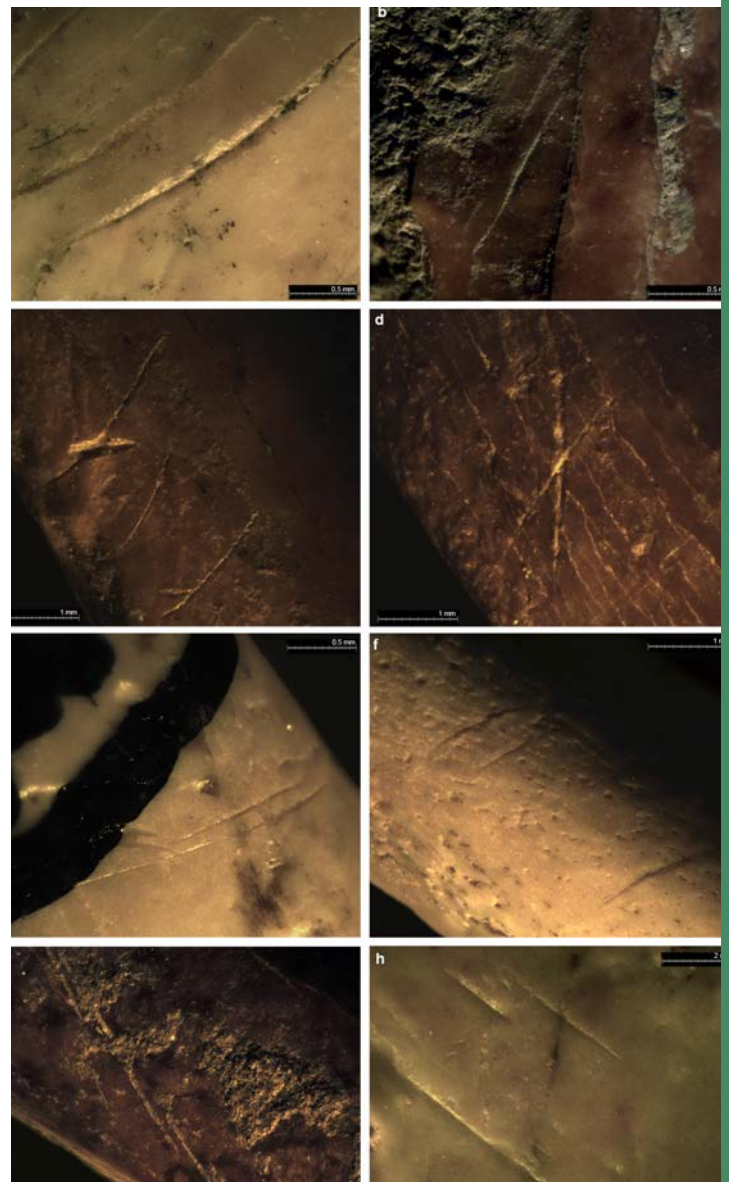


FIGURE 2.41 Under electron microscope, evidence of cut marks made by Neanderthal stone tools on raptors and corvids is clearly visible. From Finlayson *et al.*, 2012.

instead the product of acculturation from modern humans or trade with them. This debate continues to generate controversy. Gorham’s and Vanguard Caves have shown that Neanderthals were associated with raptors and corvids of particular characteristics (dark remiges, scavenging or colonial cliff nesters) and they directly processed their bones for their feathers. In this respect they were distinctly human.



FIGURE 2.42

The potential within the caves goes beyond the understanding of archaeological levels and, at Vanguard Cave, has the resolution to observe snapshots which may have involved single day activities of the Neanderthals. The plan shows the distribution of stone artefacts, marine molluscs and a hearth telling the story of a day in the life of a Neanderthal group. The stone flakes were refitted indicating that the tools were made on site as the Neanderthals lit the fire. They then placed the marine molluscs on the fire to cook and used the tools to open them up. The following day the Neanderthals left the site and the dune covered up the evidence. From Barton, 2000.

High resolution evidence

The information which has already come out of the site has changed our understanding of this relationship between Neanderthals and raptors, and of the nature of the Neanderthals themselves. This information has come from scratching the surface as the deposits within the caves offer potential for research that will last decades. The potential within the caves goes beyond the understanding of archaeological levels and, at Vanguard Cave at least, has the resolution to observe snapshots which may have involved single-day activities of the Neanderthals (Barton *et al.*, 2012; Figure 2.42). In other cases the dune rapidly covered ponds which had dried up within the cave, amazingly leaving the impression to be excavated tens of thousands of years later (Figure 2.43). The evidence within the site and the present-day components offer a unique potential for interpretation and education *in situ* where the results of scientific research can be directly transposed in an accessible manner to a wide audience – a veritable Neanderthal Park.



FIGURE 2.43 In some cases within Vanguard Cave, the dune rapidly covered ponds which had dried up within the cave, amazingly leaving the impression to be excavated tens of thousands of years later.

Lithic Technology

The Mousterian record from the Gibraltar caves provides a rich sequence of Neanderthal occupation in an optimal habitat. The high biodiversity and stability of the Gibraltar climate seems to have allowed this region to act as a refuge for the Neanderthals as it is known to have been for many species of plants and animals. As the climate deteriorated during the latter stages of their occupation the technological response of the Neanderthals was to use more expedient flaking strategies on locally available material, reflecting a reduction in mobility and a contraction into the core zone of the refugium (Shipton *et al.* 2013).

Gibraltar Neanderthals

The association between Mousterian technology and the Neanderthals is well-documented across Europe and Gibraltar itself has played a role in establishing the link. The excavation of Devil's Tower (Figure 2.97; 3km from Gorham's and Vanguard Caves), a rockshelter on the northern end of Gibraltar, produced a Neanderthal cranium in association with Mousterian industry (Garrod *et al.* 1928). It follows that the Mousterian artefacts recovered from Gorham's and Vanguard Caves were made and used by Neanderthals. As a well-documented refuge, Gibraltar presents an ideal opportunity to examine how lithic technology is adapted in response to changes in climate and hominin range size. In general more formal technologies tend to be used by more mobile hunter-gatherer groups, while hunter-gatherers with smaller ranges tend to invest less in technological adaptations. Core reduction strategies, flake platform preparation, ratios of different artefact classes and raw material selection have been

particularly informative in studies of Neanderthal mobility and technological adaptations. To test for technological variation on Gibraltar raw materials, artefact classes, flake platform types, and a suite of metric measurements to characterize the technology of lithic cores have been recorded.

Various materials suitable for lithic manufacture are available on Gibraltar, the lowest quality of which is the limestone of the Rock itself. A quartzite outcrop occurs on the western side of the Rock. Although these materials were utilised, the rounded cortex on most of the artefacts from Gibraltar's caves indicates they were procured as water-worn cobbles, which are readily available on the beaches, as well as from now submerged rivers and alluvial fans. Occasional instances of more angular cortex may have been procured from now submerged pillars of quartzite 20m below current sea level in front of Gorham's Cave. Various colours of chert may be found as beach pebbles, embedded within several fossil beaches higher up the Rock from sources that are currently submerged, and as primary veins in the Rock. At the northern end of Gibraltar between Devil's Tower and Forbes Quarry there is a source of heavily fractured dark grey chert. Red chert (sometimes called jasper) and green chert are available from the Devil's Bellows, also towards the south of Gibraltar. These cherts occur as pebbles and cobbles on the beaches, and the presence of rounded cortex on some artefacts indicates that they were exploited as such. Chemical composition indicates that while most of the chert derives from these marine sources, some was also obtained from inland Iberia. Angular cortex on a honey-coloured chert suggests procurement from a more primary source which is not known on Gibraltar. The nearest known source of this material is in terrace deposits 17km to the north-west of Gibraltar.

The lowest occupation horizon in Vanguard Cave contains just 37 artefacts with the presence of two flakes with centripetal dorsal scar patterns and one faceted platform suggesting some use of discoidal and/or Levallois technology. The low density of artefacts in all three horizons suggests sporadic occupation. The intermediate occupation horizon contains two hammers of quartzite and one of sandstone, which, along with 46% of artefacts being smaller than 15mm and the refitting of some chert flakes, suggests some *in situ* knapping. The two cores recovered are both multiplatform, including one of chert and one of limestone. The limestone core has 14 scars on it and the 18 flakes and flaked pieces of limestone from this horizon may have been struck off this core. The core has a mean platform angle of 100° (taken on the last surface to be flaked), it exhibits no platform preparation and it is one of the largest cores found anywhere on Gibraltar, weighing 529g. The lack of shaping and platform preparation on the core indicates that it was flaked opportunistically with little consideration for prolonging its use-life through the maintenance of low platform angles; hence it was discarded while still large. A core rejuvenation flake on red chert indicates this expedient flaking strategy was not applied to chert; instead effort was made to increase the use-life of chert clasts. Interestingly there is a sole flake of honey-coloured chert with a centripetal dorsal scar pattern, which at 54mm long is larger than any of the other chert flakes. It was likely to have been transported to the site in its present form rather than being produced there. There is a hearth in this horizon, and remains of seal, ibex and red deer that show evidence of butchery with stone tools. In the upper occupation horizon the presence of two quartzite cobble hammerstones, one of which refits from two halves, suggests some knapping took place here. Just over half the artefacts were quartzite, with many of the quartzite pieces less than 15mm in length. The only cores from this area were of limestone, one of which was discoidal and the other multiplatform. There are only a few plain limestone flakes (N = 5) and some flaked pieces (N = 6) which accords with the low number of flake scars (N = 5) on the multiplatform core. However, the discoidal core has 22 scars, suggesting smaller limestone flakes may not have been differentiated from the unmodified limestone of the cave during excavation. Chert artefacts are also present including the red and greyish-green varieties available on Gibraltar. The only flakes with complex centripetal dorsal scar patterns are in chert and the absence of any chert cores suggests these artefacts were part of a longer, more spatially-distributed reduction sequence than either the quartzite or the limestone.

The Hyaena Cave, which is approximately the same level as the three occupation horizons in Vanguard Cave also contained artefacts of quartzite, chert (including red chert) and limestone, and is associated with a hearth. A hearth located in the upper part of Vanguard Cave, dated to 108,500 years ago, is associated with shellfish remains and lithics. The lithics may be divided into two groups, a dense concentration of quartzite artefacts and five chert pieces. The chert artefacts comprise three retouched pieces and a plain flake on dark grey chert, and an *éclat débordant* on

dark red chert, and were likely introduced as finished artefacts. It is suggested that some of these chert pieces were used as shucks for opening the associated shellfish. The quartzite artefacts are numerous (N =1084), largely concentrated in a dense c. 1m² area, and they include refits and 997 artefacts, 15mm in maximum dimension. All these factors indicate that they represent a discrete knapping episode, with the low frequency of thermal modification showing that this took place after the associated fire had died down. Quartzite cobbles are available from the beach in front of Vanguard Cave and this artefact scatter was probably generated from such a source. There are three cores in the scatter, two of which are multiplatform and the third a discoidal core. The discoidal core may have passed through a Levallois stage, as indicated by the presence of a Levallois flake and a centripetal flake with a faceted platform.

Micromorphology indicates that Gorham's Cave was occupied intermittently by both hominins and hyenas. Based on stratigraphy, the Gorham's Cave Mousterian sequence may be divided into six main phases. The lowermost phase contains few artefacts and is undated. The next phase comprises the upper Sands and Stony Lenses member (SSLm) which is divided into six sub-units and may be correlated with Waechter's layers L, M, O and P (excavations between 1951 and 1954; see section 2.b.2; Waechter 1951, 1964). Two sub-units for this member have OSL ages of 56,500 and 67,900 years ago. The use of the Levallois technique is clearly apparent in this member with some Levallois points recovered, as well as several Levallois cores. The Levallois cores include preferential centripetal forms as well as recurrent Levallois flaked centripetally, bi-directionally and uni-directionally. Flakes with faceted butts are numerous: where systematically-recorded they comprise 25% of flakes and, correspondingly, flakes with prepared platforms constitute 21% of the assemblage from Waechter's layers L, M, O and P. Hammerstones and the presence of small chips, 15mm in length indicate on-site knapping in some sub-units. Retouched artefacts comprise 1.1% of the combined Waechter and more recent assemblages, with types including notches, scrapers and burins. Chert dominates the raw materials including the Levallois cores, although quartzite was also used for this technique, while a single limestone core was flaked unifacially. The non-local honey-coloured chert appears frequently in this member, including four large flakes with faceted platforms, a core rejuvenation flake from sub-unit 5, and a blade 126mm long from sub-unit 6.

Overlying the Sands and Stony Lenses member is the Lower Bioturbated Sands member (LBSm), which has numerous coarse and fine facies. Five radiocarbon dates place the age of this member at c. 47,500 years ago. Levallois technology is present in this member with recurrent bi-directional core forms, core rejuvenation flakes and Levallois flakes and points. A range of less formal core types is also present including faceted uni-directional and centripetal discs (distinguished from Levallois by a lack of shaping of the main flaking surface), classic discoidal cores, and occasional multi-platform and single-platform cores. Both chert and quartzite cores are well represented. A moderate proportion of flakes have prepared platforms and again hammers and microdebitage indicate on-site knapping. An artificially smoothed elongate cobble from this member has been interpreted as an abrader, while two ungulate long bone fragments are described as retouchers. Retouched artefacts comprise 2.9% of the combined flake assemblages and include scrapers, notches, burins, Mousterian points and a denticulate. The Lower Bioturbated Sands have a similar raw material distribution to the member below with chert dominating over quartzite; however there is more use of quartzite here and less use of the non-local chert. One particular sub-unit has 12 flakes of honey-coloured chert, five of which have centripetal dorsal scar patterns, a further three are Levallois flakes, and two are retouched artefacts.

The next member going up the sequence is the Bedded Sands (BeSm), which date to around 46,000 years ago. Levallois products are present in this member, along with a moderate proportion of faceted flakes, but as yet no Levallois cores have been found. Most of the cores are discoidal with faceted discs also present from which the Levallois products could have been derived. Refits, small chips and longitudinally broken flakes demonstrate in situ knapping, with 39% of flakes having cortex, indicating the early stages of reduction were carried out here. Retouched artefacts comprise 3.5% of the flake assemblage and include denticulates and amorphous pieces. The use of quartzite over chert again increases in this member over the previous one, with non-local chert becoming rarer. This level is equivalent to Waechter's layer H, although he regards the artefacts from this level as being intrusive from the rich overlying layer G.

The most recent Mousterian member in the middle area of Gorham's Cave is the Upper Bioturbated Sands member (UBSm). The three lower sub-units of this member have Mousterian artefacts with radiocarbon dates for these sub-units ranging from 45–34,000 years ago. This member is equivalent to Waechter's layer G. Levallois products are evident at low frequencies in this level, with two Levallois points and one Levallois flake recorded. However, very few Levallois cores were recovered, with Waechter producing just nine preferential Levallois specimens out of 150 cores, and no Levallois cores found in the more recent excavations. Instead, discoidal and multi-platform cores dominate both assemblages. Correspondingly, very few flakes from this layer have prepared platforms. Retouched artefacts constitute 1.2% of the flake assemblage and include notches, denticulates, burins and scrapers. Raw material distributions are similar to the Bedded Sands member with quartzite dominant, followed by chert and then non-local chert. A refit between two artefacts from these two members accords with their similarity in technology and raw material distribution and the observation that bioturbation has mixed the boundary of these deposits. This suggests that in accordance with Waechter, the artefacts from these upper Bedded Sands and the lower Upper Bioturbated Sands should be viewed as a single assemblage.

Towards the back of Gorham's Cave new excavations have uncovered Mousterian artefacts in a young deposit known as Layer IV. Layer IV has been dated via radiocarbon to between 39,000 and 32,000 years ago. The cores from Layer IV include four single-platform cores, one discoidal core, one faceted centripetal disc and two broken cores. The occasional presence of flakes with faceted platforms and radial dorsal scar patterns accords with the presence of a faceted centripetal disc core. Retouched pieces include scrapers and denticulates and comprise 6.7% of the flake assemblage. No non-local cherts are present in the raw materials, with this assemblage dominated more by coarser grained quartzites than any other Mousterian layer from Gorham's Cave.



Gibraltar Neanderthals

FIGURE 2.44 Bennett's Cave has unexcavated sediment but artefacts from here confirm Neanderthal presence.

Bennett's and Hyaena Caves

Bennett's Cave (Figure 2.44) has unexcavated sediment but artefacts from here confirm Neanderthal presence. It has a depth of 12m with a height of 40m and width of 14m at the entrance. The smaller Hyaena Cave (Figure 2.32), with a depth of 6m, lies adjacent to Vanguard Cave. It has a height of 5m and a width of 7m at its entrance.

The Upper Palaeolithic of Gorham's Cave

Gorham's Cave is also important in that it has Upper Palaeolithic (Figure 2.45) deposits of Modern Human (Solutrean and Magdalenian) occupation above the Neanderthal sequence, spanning the time range 22,000-13,000 years ago. The earliest Upper Palaeolithic technologies commonly ascribed to modern humans in Europe – the Aurignacian and Gravettian – are not represented in Gorham's Cave. It is further evidence of a late arrival of modern humans to the area, probably the result of Neanderthal persistence.

Even though there is a slight chance that there may have been contact between the two groups regionally, there is no evidence of contact in Gibraltar itself. This is therefore a unique, single-site, record of the Neanderthal-modern human transition in southern Europe, the southernmost extreme of the Neanderthal range and one of the last places in Europe reached by modern humans. In addition, the walls of Gorham's Cave have significant panels of Palaeolithic rock art and a collection of perforated and polished deer teeth and shells that are attributed to the Solutrean and dated to 20,000 years ago (Balbin Behrmann *et al.* 2000; Figure 2.46 and Figure 2.47). The highest archaeological levels in this cave represent brief episodes of occupation in the Neolithic (5,330-5,210 years BCE) and protracted use as a coastal shrine by Eastern Mediterranean mariners (800-410 years BCE). In addition there are several preserved high-stand sea level positions within the Gorham's Cave Complex that reflect climate-induced eustatic changes.

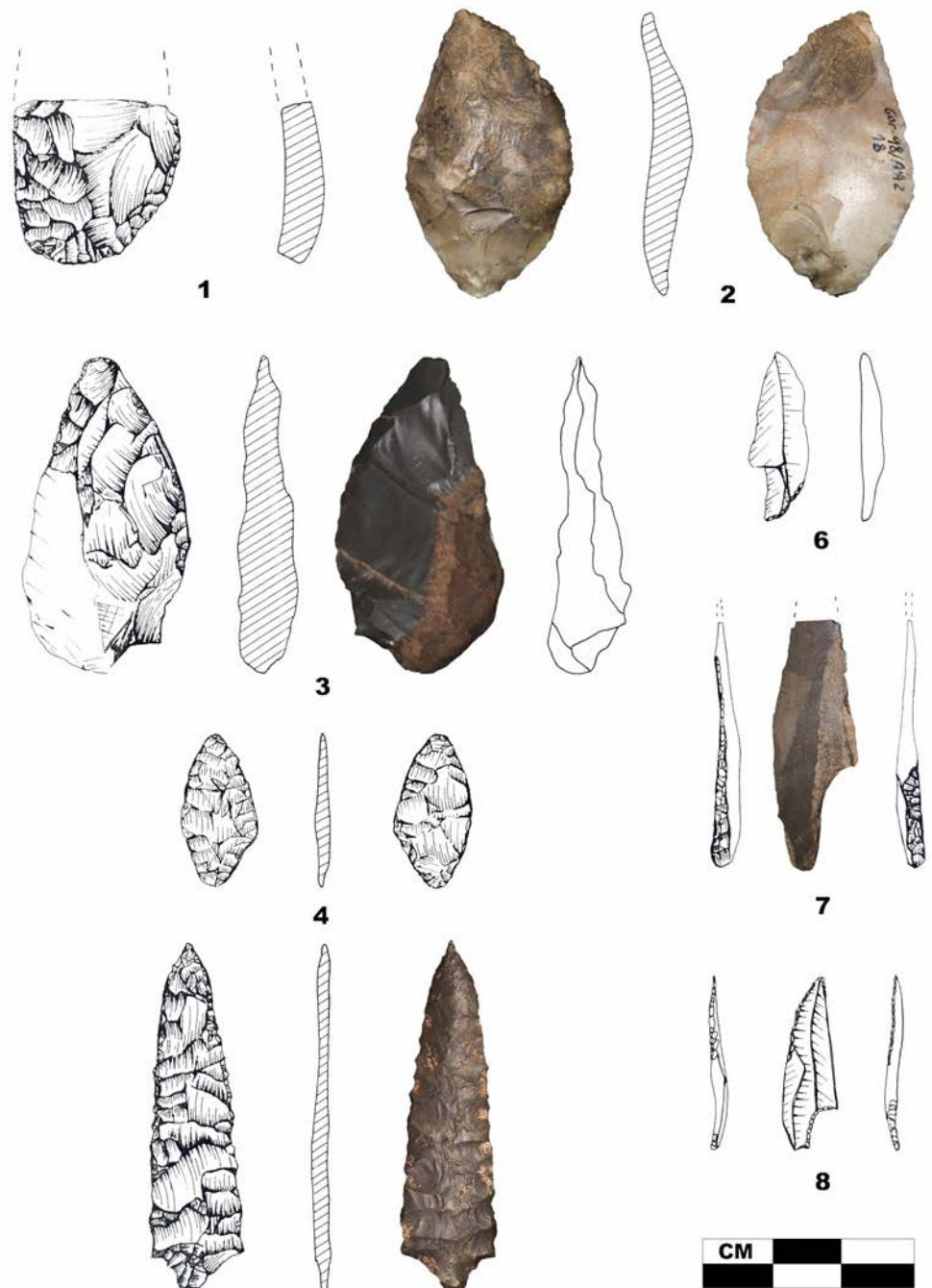


FIGURE 2.45

Upper Palaeolithic (Solutrean) technology from Gorham's Cave - associated with the first modern humans.

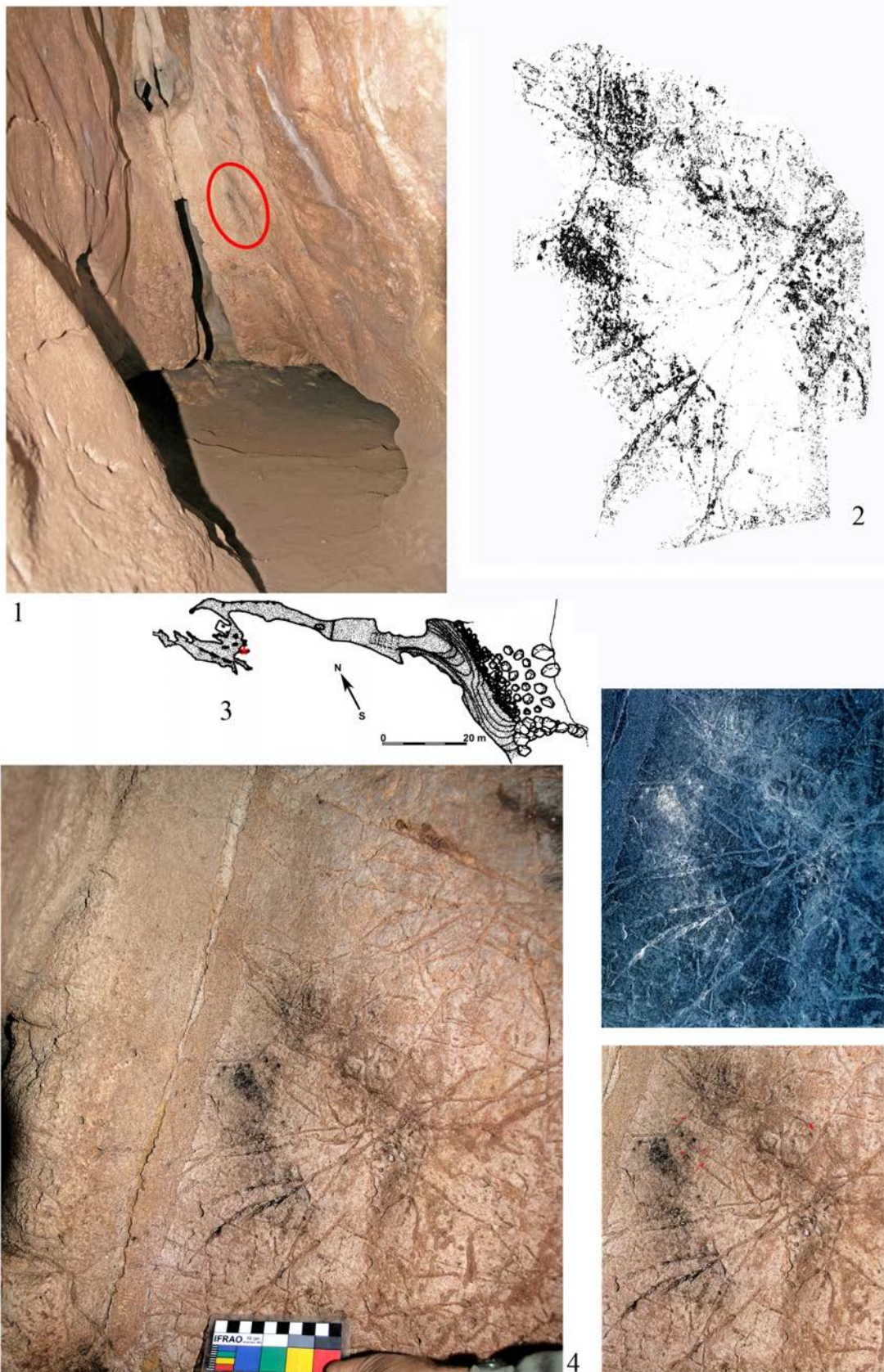


FIGURE 2.46 (a)

Solutrean cave paintings (20,000-years old) in Gorham's Cave – human hand.



Gibraltar Neanderthals

FIGURE 2.46 (b) Solutrean cave paintings (20,000-years old) in Gorham's Cave – Red Deer Stag.



FIGURE 2.47 Perforated and polished deer teeth and shells from the Solutrean Period at Gorham's Cave.

Martin's and Goat's Hair Twin Caves

In addition to Gorham's, Martin's 1 and the Goat's Hair Twin Caves were occupied by modern humans during the Upper Palaeolithic and complement the Neanderthal caves within the site.



FIGURE 2.48 Martin's Cave 1 is situated on the east side cliffs, at 190 m AOD, off Mediterranean Steps (Fig. 1.1).



FIGURE 2.49 Goat's Hair Twin Caves are located on the Mediterranean Steps at an altitude of 210m AOD.

Martin's Cave 1 is situated on the east cliffs just off the Mediterranean Steps, at 190m AOD. (Figure 1.2 & Figure 2.48). It is a large cave, with a depth of 42m and a maximum width of 26m. The entrance is 2.6m high and 5.5m wide. Upper Palaeolithic and Neolithic artefacts have been recovered from this cave (Giles Pacheco *et al.*, 2000) which also has parietal art from this period (currently under study). These appear to be abstract signs and depictions of animals, including ibex, in ochre.

Goat's Hair Twin Caves are located on the Mediterranean Steps at an altitude of 210m a.s.l (Figure 1.2 & Figure 2.49). The southern cave is 6.8m high and 4.8m wide at the entrance, with a depth of 17.8m and maximum width of 4.8m. Its twin cave immediately to the north is 2.55m high and 4.7m wide at the entrance and has a depth of 17.6m with a maximum width of 5.6m. Upper Palaeolithic and Neolithic artefacts (including flint blades, points and ceramics) have been recovered from this cave (Giles Pacheco *et al.*, 2000).



**FIGURE
2.50**

Gorham's Cave, together with the adjacent sites of Vanguard, Hyaena and Bennett's Caves comprise a uniquely well-preserved archaeological and palaeontological ensemble that provide a detailed record of Neanderthal ecology and behaviour and their responses to climate change. Left to right: Bennett's Cave, Gorham's Cave, Vanguard Cave, Hyaena Cave. Beyond, looking north are submerged and partly-submerged caves.

Palaeolithic Sites Summary

Gorham's Cave, together with the adjacent sites of Vanguard, Hyaena and Bennett's Caves (Figure 2.50), therefore comprise a uniquely well-preserved archaeological and palaeontological ensemble (Section 3.2) that provide a detailed record of Neanderthal ecology and behaviour and their responses to climate change.

This understanding has been considerably enhanced by a rich fossil record of vertebrates, molluscs and plant remains at the site, including the highest avian species diversity of any Middle/Upper Palaeolithic site in the world (Figure 2.51; section 2.a.10 and Appendix 1). The stratigraphic depth in these caves (18m in Gorham's and 17m in Vanguard) ensures a research programme that has the potential to continue for several decades within a strictly-managed research framework strategy (Figure 2.52 and Volume 4 of this Nomination).



FIGURE 2.51 Our understanding of Neanderthal ecology and behaviour and their responses to climate change has been considerably enhanced by a rich fossil record of vertebrates, molluscs and plant remains at the site, including the highest avian species diversity of any Middle/Upper Palaeolithic site in the world. Above: Spotted Hyaena *Crocota crocuta*; Below: Golden Eagle *Aquila chrysaetos*: fossils from Gorham's Cave.



**FIGURE
2.52**

The stratigraphic depth in these caves (18m in Gorham's and 17m in Vanguard) ensures a research programme that has the potential to continue for several decades. Photograph of Gorham's Cave.

2.a.8 Flora

One of the key attributes of the nominated property is the vegetation. This well-preserved vegetation resembles very closely that which grew on the limestone cliffs at the time of the Neanderthals, identified from pollen and charcoal fossil remains within the caves (Carrión *et al.* 2008). It provides an exceptional canvas to the geological backdrop and sets the Neanderthals vividly in their world.

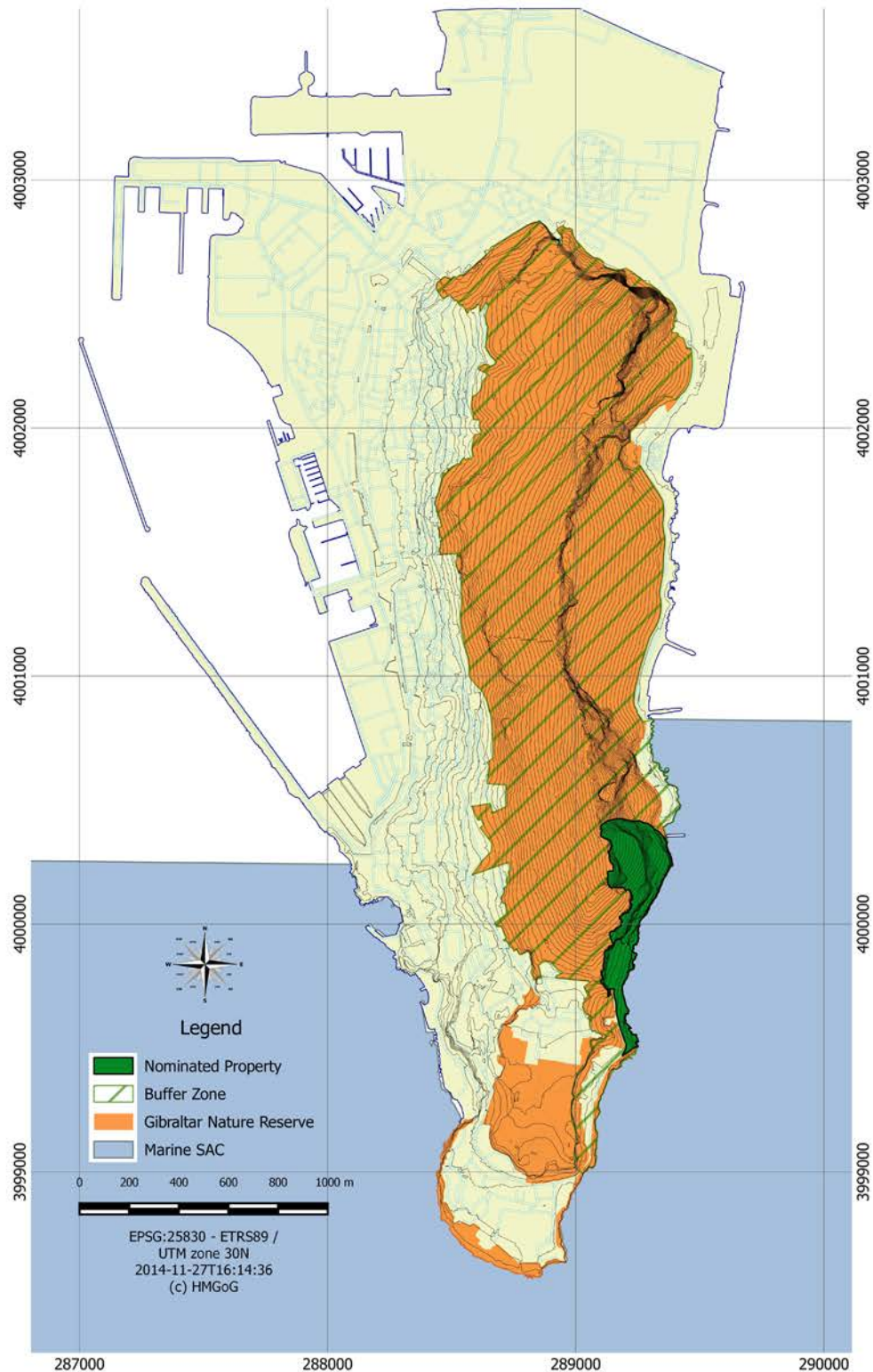


FIGURE 2.53

Location of the Gibraltar Nature Reserve and the Marine Special Area of Conservation in relation to the nominated World Heritage Site.

Most of the Rock itself is within the boundaries of the Gibraltar Nature Reserve (Figure 2.53), characterised by a diverse flora with 630 species (Figure 2.54, Linares *et al.*, 1996). Thirty-seven plant taxa found within the property today are also represented in the Late Pleistocene Cave deposits (Appendix 1). The evidence comes from fossil pollen in the sediment, in hyaena coprolites as well as in the charcoal from the hearths started and used by Neanderthals and modern humans. This evidence translates into a picture of Late Pleistocene Gibraltar which is dominated, in spite of the glaciations, by warm Mediterranean vegetation under similar conditions to today.



FIGURE 2.54 Most of the Rock itself is characterised by a diverse flora with 630 species. The photograph shows a Gibraltar Candytuft *Iberis gibraltatica*, a typical species within the nominated property. It is a native of North Africa, and Gibraltar is its only European outpost.

A latitudinal vegetation pattern, north to south across the European continent, for the period 50,000–12,000 years ago, is shown in Figure 2.55 (Finlayson & Carrión, 2007). The Velay pollen sequences in the French Massif Central (location in Figure 2.5) show the succession of several short temperate episodes of tree colonization (open boreal forest) alternating with complex cold phases that are characterized by shrubby tundra.

In the Navarrés pollen record, eastern Spain, woodlands dominated by oaks and pines, occur between 31,000 and 27,000 years ago. After 27,000 years ago, the landscape shows a return to glacial conditions, with high percentages of steppe species. Pines, however, continue to be abundant and eventually reach high proportions. Pollen in cave sediment and coprolites, and charcoal analysis, from Gorham’s Cave, Gibraltar, reveal a highly diversified landscape, including oak, pine and juniper savannahs, forests, wetlands, grasslands with heaths and xerothermic coastal scrub. Little change is observed in the palaeo-landscapes in the period 32,000–12,000 years ago, which demonstrates that Gibraltar was a reservoir of woody species during the OIS3 and LGM.

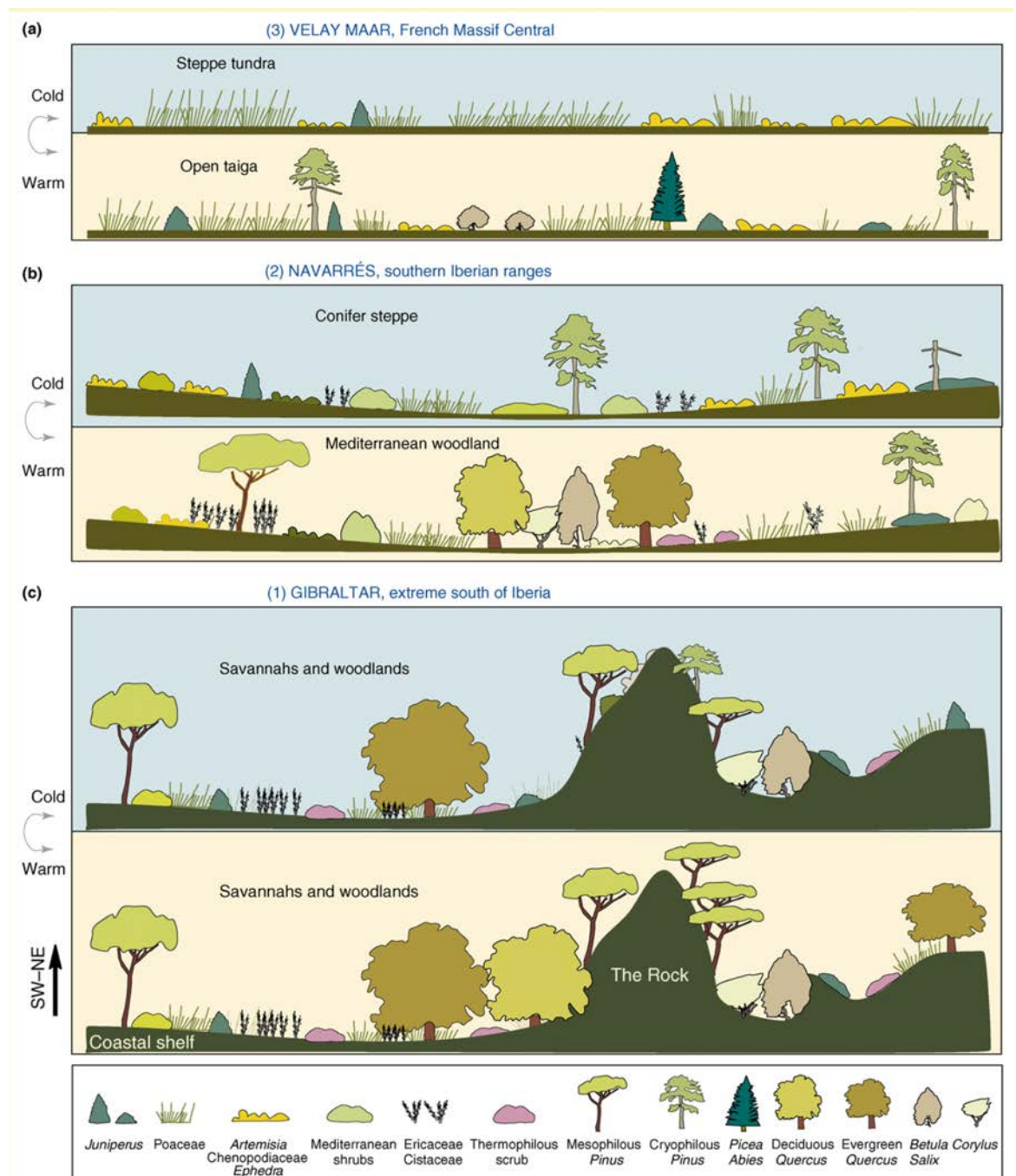


FIGURE 2.55 Latitudinal vegetation pattern across Europe, demonstrating that Gibraltar was a reservoir of Mediterranean vegetation during glacials in the Late Pleistocene.

The main extant plant taxa are largely species of the limestone, those currently missing being largely species that would have been on the now-submerged sandy coastal shelf. This limestone plant community resembles closely that of today, well-represented on Mediterranean Steps (Figure 2.56) and other areas of the property as well as the buffer zones within the Gibraltar Nature Reserve.



**FIGURE
2.56**

Natural cliff vegetation, with many species dating back to Neanderthal days, on Mediterranean Steps. This well-preserved vegetation resembles very closely that which grew on the limestone cliffs at the time of the Neanderthals, identified from pollen and charcoal fossil remains within the caves. It provides an exceptional canvas to the geological backdrop and sets the Neanderthals vividly in their landscape.



FIGURE 2.57 Present-day components of the vegetation, such as wild olives *Olea europaea*, are well represented in the cave record.

Among the present-day components - also represented in the cave record at species or genus level (Figure 2.57) - are honeysuckle *Lonicera implexa* (Figure 2.58), Rough Smilax *Smilax aspera*, Lentisc *Pistacia lentiscus*, Spiny Broom *Calicotome villosa*, Shrubby Hare's-ear *Bupleurum fruticosum*, Mediterranean Buckthorn *Rhamnus alaternus* (Figure 2.59), Spiny Buckthorn *R. lycioides*, Wild Olive *Olea europaea* (Figure 2.60), Joint-Pine *Ephedra fragilis*, Common Asphodel *Asphodelus aestivus*, White Asphodel *A. albus* and Narrow-leaved Fringed Rue *Ruta angustifolia*. Even though much of the sandy habitat is now submerged, several species grow on the sands within the buffer zone and are also represented in the cave record at species or genus level: White Asphodel *A. albus*, Silver Knapweed *Centaurea sonchifolia*, Buck's-Horn Plantain *Plantago coronopus* and Southern Birdsfoot Trefoil *Lotus creticus*.



FIGURE 2.58 Honeysuckle *Lonicera implexa* is a common species on the nominated property today, flowering between March and August. The genus has been identified from the Gorham's Cave sediments.



**FIGURE
2.59**

Mediterranean Buckthorn *Rhamnus alaternus* is a common woody species on the nominated World Heritage site today, flowering between February and April and fruiting in the summer months. The fruit is eaten by many bird species. The species has been identified from the Gorham's Cave sediments.



**FIGURE
2.60**

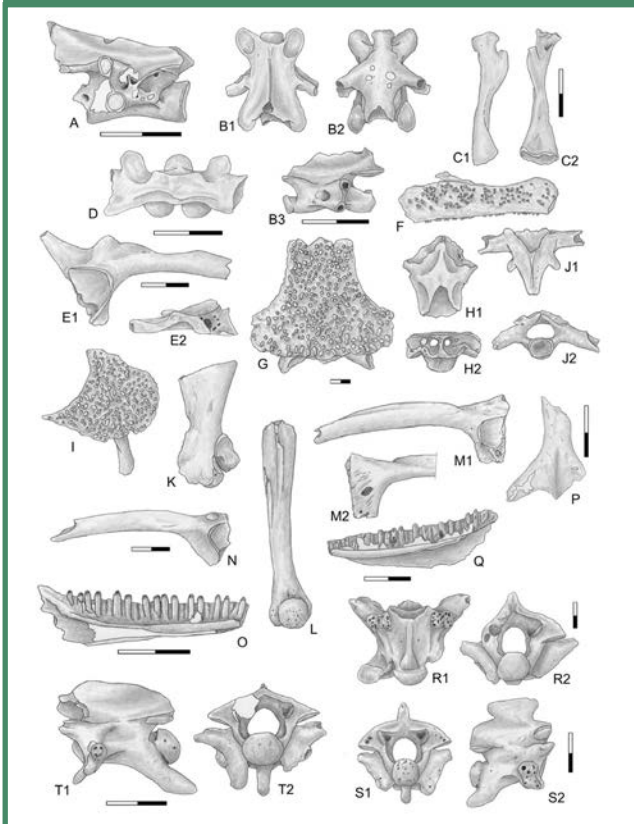
The Wild Olive *Olea europaea*, flowering between May and June and fruiting in the autumn, is a dominant component of the nominated property's vegetation. The fruit are consumed by many wild birds, especially those on migration. The wild olive is a recurrent feature of the Gibraltar vegetation, appearing frequently among the species identified from the Gorham's Cave sediments.

2.a.9 Amphibia and Reptilia

The current conditions on Gibraltar with no free-standing bodies of water given the porous nature of limestone are unsuitable for amphibians. The amphibians present in the cave fossil record were species that would have thrived in the pools and streams of the emerged coastal platform (now-submerged). There is, on the other hand, habitat suitable for reptiles, on the limestone cliffs and on the Catalan Bay Sand Dune, within the buffer zone. A remarkable 12 (60%) of the 20 species recorded in the cave fossil record are still present today (Figure 2.61, Appendix 1).



Amphibians and reptiles have very specific climatic tolerances and are therefore good indicators when found in cave deposits (Blain *et al.* 2013). This evidence, built up from the high fossil biodiversity of these caves, indicates that conditions in Gibraltar at the worst moments of the glacials were between 1.6 and 1.8°C lower than today. Winters were cooler but summers resembled today. Mean annual precipitation was slightly lower than today.



**FIGURE
2.61**

Above: small selection of amphibian and reptiles remains from Vanguard Cave, illustrating the richness of the deposits for these taxa.

Below: selection of amphibian and reptile species from Gorham's Cave, after Blain *et al.*, 2013.

2.a.10 Aves

One of the most important attributes which give the property its Outstanding Universal Value is the impressive Late Pleistocene bird fossil record. Currently at 150 species (Figure 2.62, Appendix 1), this constitutes 29% of Europe's breeding avifauna (Hagemeijer & Blair, 1997).



**FIGURE
2.62**

Currently 150 bird species have been identified as fossils in the site's caves. This constitutes 29% of Europe's breeding avifauna. Photograph shows a Hoopoe *Upupa epops*, a typical migratory bird on the candidate World Heritage Site today and a species identified in the Gorham's Cave fossil record.

The Rock is also internationally famous as a major stopover for migratory birds using the western European flyway (Finlayson, 1992). Of 110 species present in the cave fossil record and still present today, 105 are migrants (Appendix 1). They include a high representation of raptors, seabirds and terrestrial passerines and near-passerines. The Rock's function as a migratory stopover is part of a long legacy which stretches back, at least, to the days of the Neanderthals and probably much further.

Many of the species identified as fossils belong to groups that currently cross the Strait of Gibraltar during their annual migrations between Europe and Africa. Many species rest on the Rock, including areas within the nominated property and provide continuity in the legacy which dates to at least the Late Pleistocene.

Birds of prey and other soaring species

A major component of the migratory avifauna is composed of raptors and other soaring bird species (Appendix 1). These rely on thermal currents for flight. As thermals do not form over the sea, soaring birds avoid long sea crossings and concentrate their migration at the two ends of the Mediterranean – the Bosphorus in the east and Gibraltar in the west (Finlayson, 1992). Seven species in this category have been recorded as fossils within the site and continue to migrate past the site today, showing that this migratory behaviour is an ancient phenomenon (Figure 2.63).



FIGURE 2.63 Seven species of migratory soaring birds have been recorded as fossils within the site and continue to migrate past the site today. The photograph shows a Griffon Vulture *Gyps fulvus*, a typical species of the fossil record, landing to rest on Gibraltar's cliffs after crossing the Strait of Gibraltar from North Africa.

Recent work on the fossil raptors (which would have included migratory and resident species) and corvids from Gorham's Cave has demonstrated that the Neanderthals selected species with black feathers, presumed for use in ornamentation (Figure 2.64, Finlayson *et al.*, 2012; see also sub-section 2.a.7). The general thesis among scholars has, until recently, been that Neanderthals - in contrast to modern humans - were incapable of catching birds, the ability to harvest difficult-to-catch prey being a feature of modern human behaviour (e.g. Stiner *et al.*, 1999). The discovery of regular and systematic exploitation of large birds for their feathers is a hitherto unappreciated fact and is one of several major advances in our knowledge of Neanderthal behaviour, and in consequence of our understanding of human evolution, which the nominated property has revealed.



FIGURE 2.64 The discovery of regular and systematic exploitation of large birds for their feathers is a hitherto unappreciated fact and is one of several major advances in our knowledge of Neanderthal behaviour, and in consequence of our understanding of human evolution, which the nominated property has revealed. The photograph shows a Raven *Corvus corax* which is one of the 21 species of raptors and corvids found in the fossil record of the caves and known to have been exploited by the Neanderthals for its black feathers.

Migratory water-birds

Eighteen species of water-birds have been identified in the cave fossil record of the site (Appendix 1). Of these, only the White Stork *Ciconia ciconia* remains a regular visitor albeit as part of the overhead soaring bird migration (Figure 2.65). The reason for the absence of water-birds today is, as with amphibians (sub-section 2.a.9), because their freshwater habitats were located on the coastal shelf (now-submerged). Water-birds, which included geese and ducks, would have been a major source of food for the Neanderthals and later modern humans (Figure 2.66).



FIGURE 2.65 The White Stork *Ciconia ciconia* is a water-bird found in the cave fossil record which migrates regularly across the Strait of Gibraltar. It can be seen overflying the property during migration.



FIGURE 2.66 Water-birds, which included geese and ducks, would have been a major source of food for the Neanderthals and later modern humans. The remains of Barnacle Geese *Branta bernicla* have been recovered from Gorham's and Vanguard Caves.

Migratory shorebirds

Sixteen migratory shorebird species have been identified in the cave fossil record (Appendix 1). These are among the longest-distance travellers, some of which migrate from the Arctic tundra to the coasts of southern Africa. These species would have provided a seasonal food resource to Neanderthals and modern humans. These species continue to pass the Strait of Gibraltar today and those stopping on the shores of the nominated property are largely those of rocky coastal habitats (Figure 2.67).



FIGURE 2.67 The Oystercatcher *Haematopus ostralegus* is among the shorebirds recorded from Gorham's Cave and still passing, and stopping at, the site during migration today.

Coastal and marine birds

Twenty-seven marine bird species have been recovered from the cave fossil record (Appendix 1). These species are a major component of the avifauna of the site and most are present today. The exception is the Great Auk *Pinguinus impennis* which is now globally extinct. These seabirds are divisible into two groups. The first consists of North Atlantic breeding species that cross the Strait of Gibraltar as they migrate between Atlantic breeding areas and wintering grounds in the Mediterranean Sea (Figure 2.68). The second consists of Mediterranean-breeding species which cross the Strait on their way to and from wintering grounds off the Atlantic coasts of Europe and Africa (Figure 2.69; Finlayson, 1992). These species are part of a PhD thesis which is currently being conducted with Anglia Ruskin University (UK), with the aim of correlating present-day phenology and distribution of species also found in the fossil record. This information will clarify possible seasons of the year and weather conditions when Neanderthals exploited particular bird species.



**FIGURE
2.68**

One group of seabirds consists of North Atlantic breeding species that cross the Strait of Gibraltar as they migrate between Atlantic breeding areas and wintering grounds in the Mediterranean Sea. Photograph shows Great Skua *Catharacta skua*, a species found in the Gorham's Cave fossil record.

The significance of the abundance and diversity of seabirds in the site's fossil record is under study and it seems likely that the Neanderthals consumed them. Their presence may be connected with increases in marine productivity off the site at times when the polar front was at the latitude of northern Portugal (~42°N) (Eynaud *et al.*, 2009). This would be borne out by the presence of coastal and pelagic species which breed in the Arctic and which rarely reach Gibraltar today (Figure 2.70).



**FIGURE
2.69**

A second group of seabirds consists of Mediterranean-breeding species which cross the Strait on their way to and from wintering grounds off the Atlantic coasts of Europe and Africa. Photograph shows a Cory's Shearwater *Calonectris borealis*, a species represented in the Gorham's Cave fossil record.



**FIGURE
2.70**

The presence of a high diversity and abundance of seabirds may be connected with increases in marine productivity off the site at times when the polar front was at the latitude of northern Portugal (~42°N). This would be borne out by the presence of seabirds which breed in the Arctic and which rarely reach Gibraltar today. Photographs show (a) flock of Long-tailed Ducks *Clangula hyemalis*, an Arctic species which is frequent in the cave fossil record but rare today, and (b) remains of this species from Gorham's Cave.

Birds of the Mediterranean savannah and shrublands

Fifty-nine species typical of Mediterranean savannah and shrubland habitats, as would have existed on the coastal shelf and still today on the Rock, including the property, are recorded in the cave fossil record. Most species occur today on migration. One group represents trans-Saharan species which are birds that breed in Eurasia and winter in sub-Saharan Africa. They use the Gibraltar area in order to refuel during their long migrations (Figure 2.71). A second group arrives from northern Eurasia to winter in the Gibraltar area and do not cross the Sahara Desert (Figure 2.72). Both groups have specific and predictable migration periods and arrive in very large numbers (Finlayson, 1981) which would have increased the likelihood of exploitation by Neanderthals as well as modern humans.



**FIGURE
2.71**

One group of savannah and shrublands migrants represents trans-Saharan species which are birds that breed in Eurasia and winter in sub-Saharan Africa. They use the Gibraltar area in order to refuel during their long migrations. Photograph shows a Northern Wheatear *Oenanthe oenanthe*, a species recorded in the Gorham's Cave fossil record, during the autumn migration.



FIGURE 2.72 A second group of savannah and shrublands migrants arrives from northern Eurasia to winter in the Gibraltar area and do not cross the Sahara Desert. Photograph shows a European Robin *Erithacus rubecula*, a species recorded from the Gorham's and Vanguard caves fossil record.

Gorham's and Vanguard Caves were also the sites of the discovery of the first European fossils of the Azure-winged Magpie *Cyanopica cyanus cooki* in association with Neanderthal levels (Cooper, 2000). This savannah species had previously been considered to have been a medieval introduction from China and the discovery is now recognised as a major contribution to the study of disjunct distributions in biogeography (Finlayson, 2011). It is among the species which are being used for the first time to develop quantitative models of the habitats which existed outside the caves when the Neanderthals occupied the area (Finlayson, 2006). This particular contribution of the nominated property reveals how fossil bird data can be used in conjunction with present-day observations of the same species to recreate ecological conditions in the Late Pleistocene (Figure 2.73).



**FIGURE
2.73**

Gorham's and Vanguard Caves were the sites of the discovery of the first European fossils of the Azure-winged Magpie *Cyanopica cyanus cooki* in association with Neanderthal levels. It is among the species which are being used for the first time to develop quantitative models of the habitats which existed outside the caves when the Neanderthals occupied the area.

Birds of rocky habitats

Twenty-five species of rocky habitats and cliffs have been recorded in the caves fossil record and many are present today (Appendix 1). They include some special species that provide an exceptional record of continuity. Some species, like the Rock Dove *Columba livia* were consumed by the Neanderthals while others were taken for their feathers (see sub-section 2.a.7). Among the cliff nesters are spectacular species like the Lammergeier *Gypaetus barbatus*, a species which is endangered across Europe today (Figure 2.74).



FIGURE 2.74 The rare Lammergeier *Gypaetus barbatus* has been recorded in the fossil record from Gorham's and Ibex Caves.



**FIGURE
2.75**

Mediterranean Peregrine Falcon *Falco peregrinus brookei* and Blue Rock Thrush *Monticola solitarius* are among the rocky habitat breeding species that have occupied the cliffs of the candidate World Heritage Site since the days of the Neanderthals. Note the articulated wing of Blue Rock Thrush (lower right) from Ibex Cave and Peregrine Falcon pelvis (top right) from Gorham's Cave, both from Neanderthal contexts.

A number of cliff-nesting species today, notably the Mediterranean Peregrine Falcon *Falco peregrinus brookei* (Figure 2.75), the Blue Rock Thrush *Monticola solitarius* (Figure 2.75) and the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* (Figure 2.76) are recorded as fossils from the oldest levels at Gorham's and Vanguard Caves and provide further evidence of continuity of species presence.



**FIGURE
2.76**

The Mediterranean Shag *Phalacrocorax aristotelis desmarestii* has a breeding population in the Gorham's Cave Complex, within the nominated property. Fossil remains of this species have been found in the caves in Neanderthal levels. Image shows adult bird (left) with juvenile (right).

The Mediterranean Shag population breeding in the Gorham's Cave Complex, within the nominated property, is the only population of this sub-species now left on the mainland Mediterranean coastline of the Iberian Peninsula (Figure 2.76).

Two wintering species are noteworthy because of their continuity at the site since the days of the Neanderthals. Crag Martins *Ptyonoprogne rupestris* at present roost in large numbers inside Gorham's and Vanguard Caves between October and March (Figure 2.77; Finlayson, 1992). Their presence as fossils in these caves indicates that this winter roost has functioned for millennia. White recorded their presence at this site in the late 18th Century (Mullens, 1913). The second species is the Alpine Accentor *Prunella collaris*, a bird of the high mountains which descends to the cliffs of Gibraltar, which provide ideal habitat, in mid-winter (Figure 2.78).



**FIGURE
2.77**

Up to 3,000 Crag Martins *Ptyonoprogne rupestris* have been known to roost in Gorham's and Vanguard Caves in winter. Recoveries of ringed birds show that these species breed as far away as the Alps and Pyrenees.



**FIGURE
2.78**

When the snows engulf the mountain peaks of the Iberian Peninsula, the Alpine Accentor *Prunella collaris* descends to the ice-free cliffs of Gibraltar.

2.a.11 Mammalia

Thirty-seven species of mammal are recorded from cave sediments within the property (Appendix 1). A number of these are terrestrial herbivores which were hunted, butchered and consumed by the Neanderthals. The Rabbit *Oryctolagus cuniculus* is the most abundant species and appears to have been an important component of the Neanderthal and modern human diet (Figure 2.79). As with birds, the exploitation of rabbits by Neanderthals on Gibraltar is a behavioural trait that has not been previously detected.



FIGURE 2.79 The Rabbit *Oryctolagus cuniculus* is the most abundant mammal species and appears to have been an important component of the Neanderthal and modern human diet. Right shows a rabbit mandible from Gorham's Cave.

Among the large mammals, Spanish Ibex *Capra pyrenaica* and Red Deer *Cervus elaphus* predominate and appear to have been major prey of the Neanderthals (Figure 2.80). Wild Horse *Equus ferus*, Aurochs *Bos primigenius*, Wild Boar *Sus scrofa*, Narrow-nosed Rhinoceros *Dicerorhinus hemitoechus* and Giant Deer *Megaloceros sp.*, along with the Red Deer, would have been species that roamed the savannahs of the emerged coastal plain while the Ibex would have been on the cliffs.

Excavations at Gorham's Cave have revealed a rich community of carnivores which would have hunted or competed with the Neanderthals (Figure 2.81). The species included a mix of Afro-Eurasian species which would not be found together anywhere in the world today: Brown Bear *Ursus arctos*, Wolf *Canis lupus*, Red Fox *Vulpes vulpes*, Leopard *Panthera pardus*, Lion *P. leo*, Iberian Lynx *Lynx pardina* and Wild Cat *Felis sylvestris*.



FIGURE 2.80 Among the large mammals, Spanish Ibex *Capra pyrenaica* (left) and Red Deer *Cervus elaphus* (right) predominate and appear to have been the major prey of the Neanderthals.



FIGURE 2.81 Excavations at Gorham's Cave have revealed a rich community of carnivores which would have hunted or competed with the Neanderthals. The species included a mix of Afro-Eurasian species which would not be found together anywhere in the world today. Spotted Hyaena *Crocuta crocuta* (top left), Lion *Panthera leo* (top right), Leopard *Panthera pardus* (bottom left), Wolf *Canis lupus* (bottom right).

The only examples of continuity of presence to the present day among mammals are the marine species and the bats (Appendix 1). Two dolphin species – Common Dolphin *Delphinus delphis* and Bottlenose Dolphin *Tursiops truncatus* – present regularly today offshore and often clearly visible from the shore within the property (Figure 2.11), are recorded in the cave fossil record. The discovery of these marine mammals alongside butchered Monk Seals *Monachus monachus* was the first, and remains the only, example of the exploitation of marine mammals by Neanderthals (sub-section 2.a.7 and Figure 2.82; Stringer *et al.*, 2008).

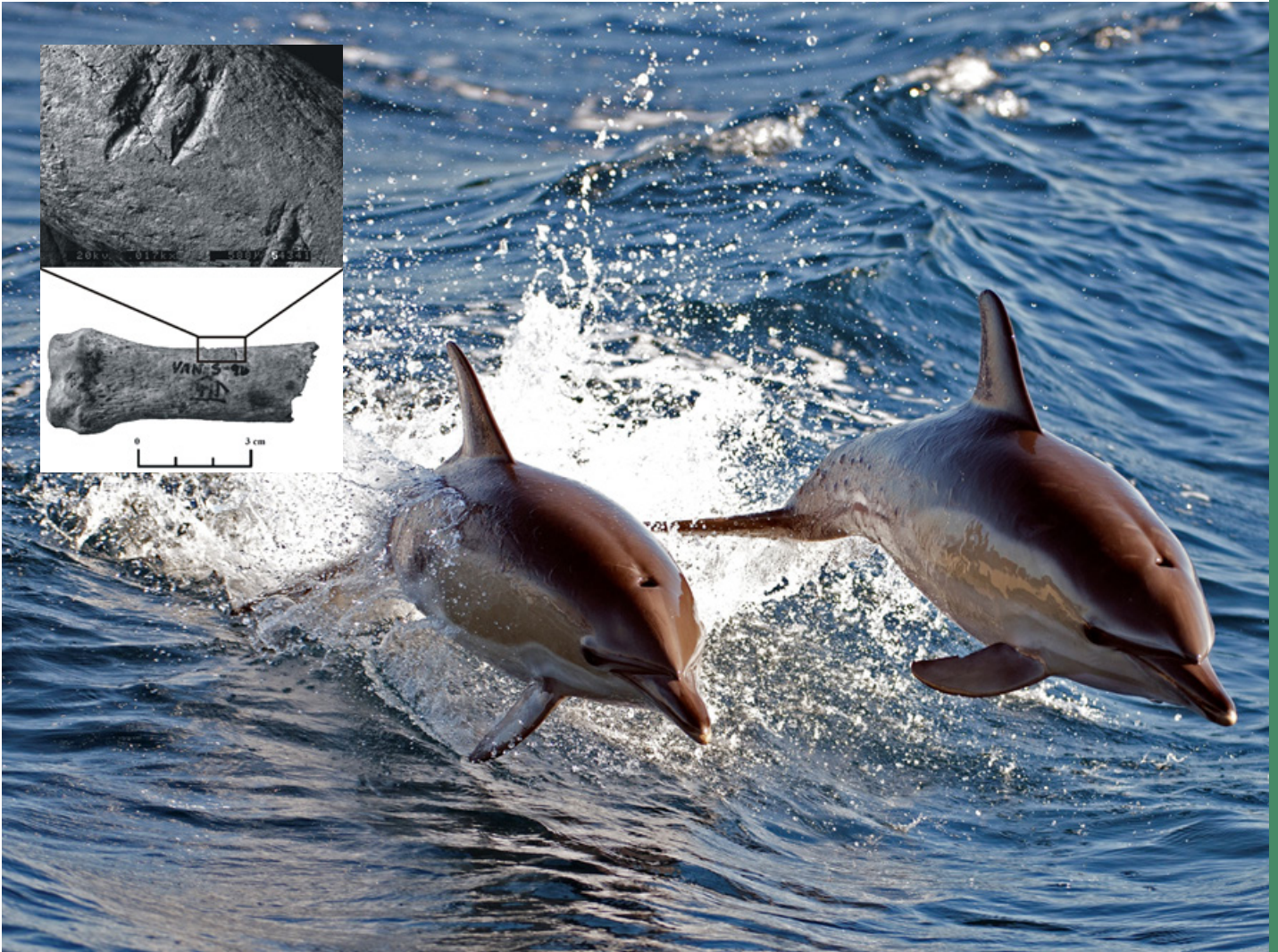


FIGURE 2.82

The discovery of dolphins alongside butchered Monk Seals *Monachus monachus* was the first, and remains the only, example of the exploitation of marine mammals by Neanderthals. Inset shows Monk Seal phalange with cut marks made by Neanderthal stone tools, after Stringer *et al.*, 2008.

The extant bat populations are not well known and are currently under study. This is also true of the cave fossil record which is only now being studied (Figure 2.83, López García *et al.*, 2011). Our knowledge of bats will improve as these studies progress but they already show a picture which is a recurring theme at this site – of the persistence of species since the days of the Neanderthals (Figure 2.84).

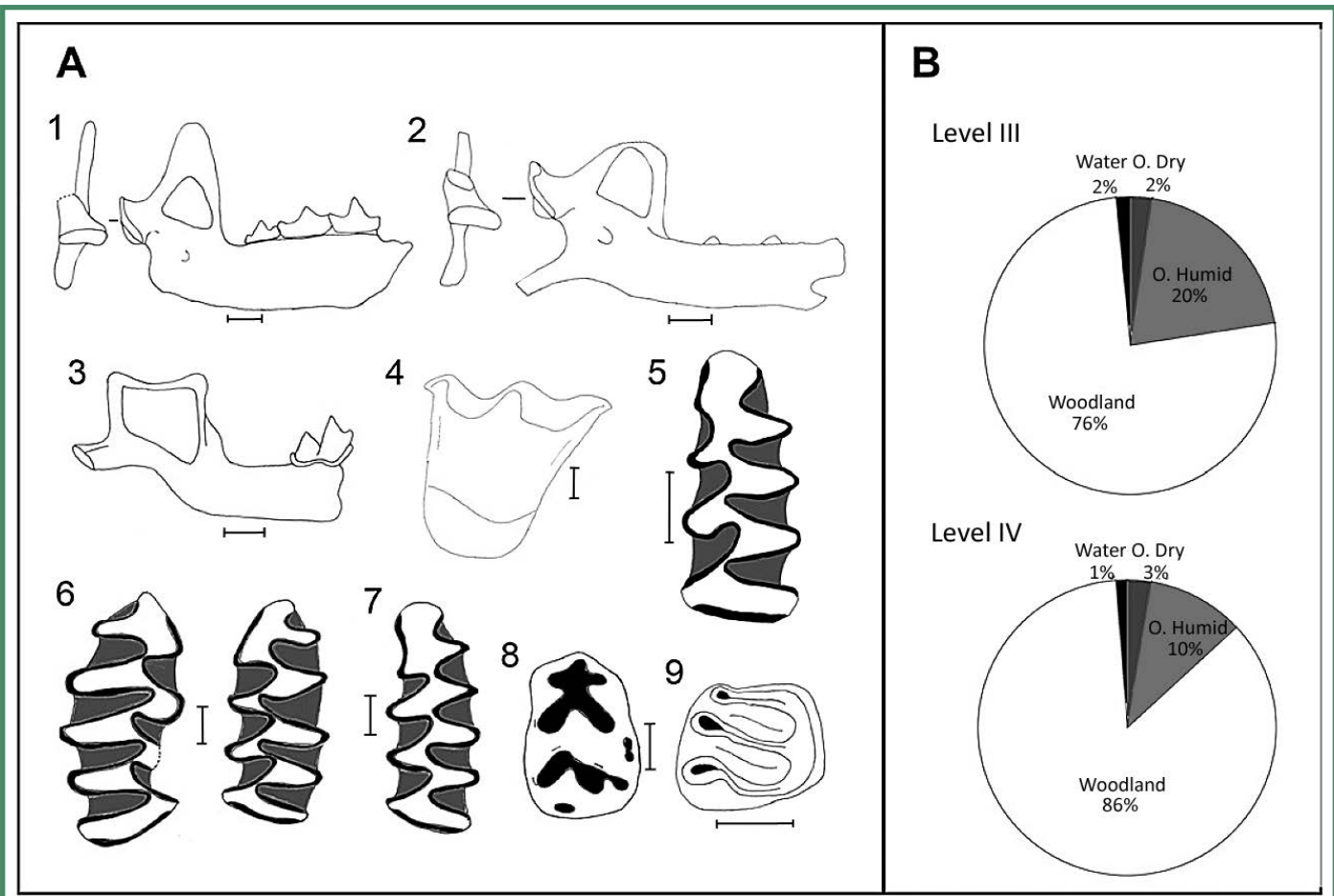


FIGURE 2.83

The cave fossil record of small mammals is currently under study. This figure shows some early results which have been used in climate reconstruction, with results which coincide with those predicted by other taxa. A. Some small mammals from Gorham's Cave: 1. Left mandible *Crocidura russula*; 2. Left mandible *Sorex gr. coronatus-araneus*; 3. Right mandible *Miniopterus schreibersii*; 4. Second upper left molar (M2) *Myotis myotis*; 5. First lower left molar (m1) *Arvicola sapidus*; 6. m1 right and m1 left *Microtus (Iberomys) cabrerae*; 7. m1 left *Microtus (Terricola) duodecimcostatus*; 8. m1 right *Apodemus sylvaticus*; 9. Second lower left molar (m2) *Eliomys quercinus*. Scale 1 mm. B. Small mammal association by habitat from the percentage of Minimum Number of Individuals. From López-García *et al.* (2011).

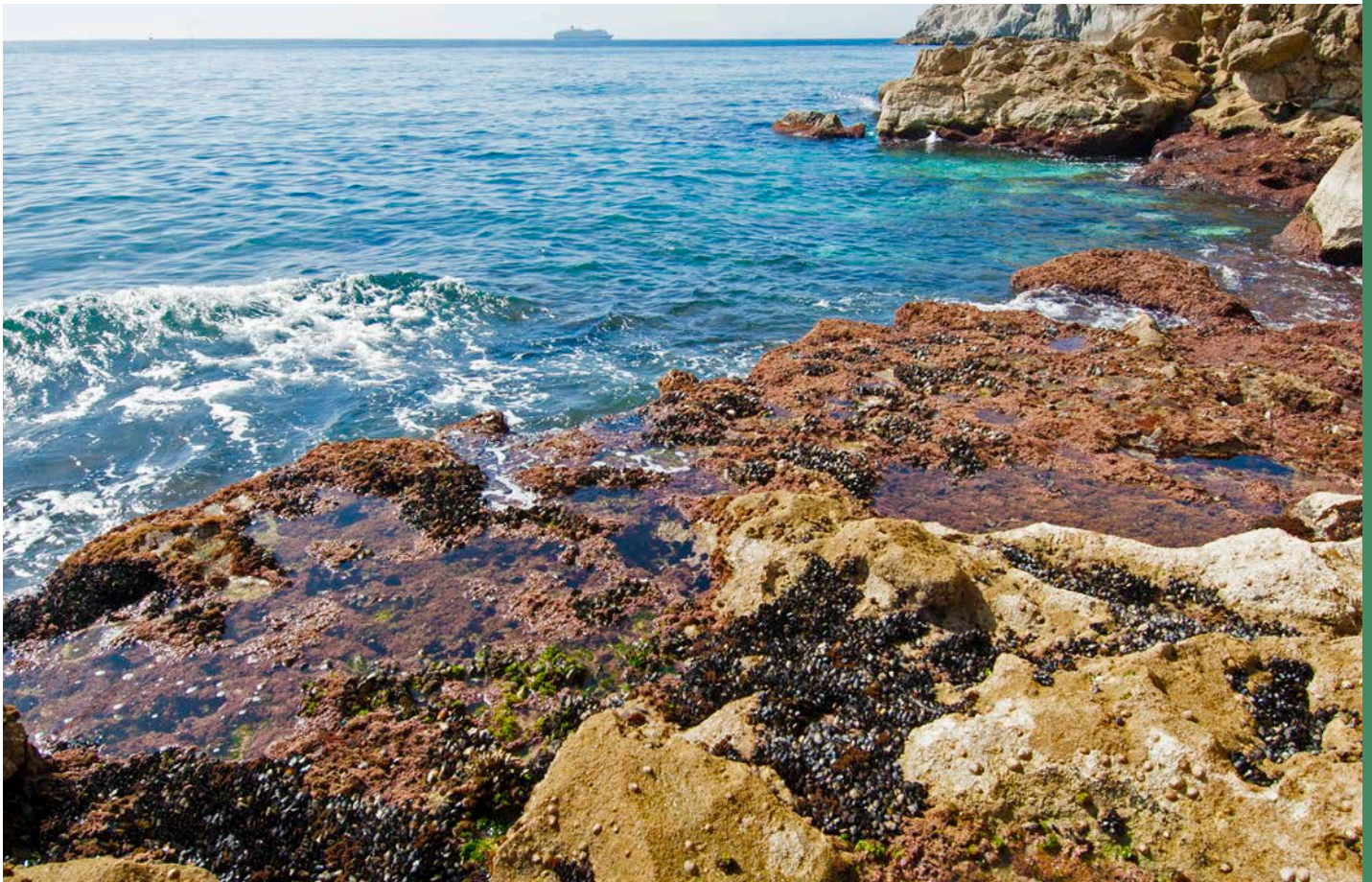


FIGURE 2.84

Schreiber's Bats *Miniopterus schreibersii* are recorded in the fossil record at Gorham's Cave (see 3 in Fig. 2.83 A) and are still present within the nominated property today. These species are the subject of current research and are strictly protected.

2.a.12 Intertidal Mollusca and other invertebrates

The well-preserved and fully-protected intertidal community on the beach by Gorham's and Vanguard Caves (Figure 2.85) includes 26 (70%) of the 37 taxa of molluscs that are recorded within the archaeological levels in the caves, providing further evidence of continuity of ecological function. A number of the mollusc species are known to have been consumed – indicated by presence in human occupation contexts including in association with hearths and stone tools - by Neanderthals and modern humans and are mainly species present on the shore outside the caves today (Appendix 1; Barton, 2000; and Brown *et al.*, 2011). Two other invertebrates are present today and have been recorded in the cave fossil record. These are the Warty Crab *Eriphia verrucosa* and the Purple Sea Urchin *Paracentrotus lividus*. The evidence from Gorham's and Vanguard Cave shows repeated exploitation of mussels and limpets, in particular, by the Neanderthals. This information adds to the total picture which these caves are providing of a diverse world and its resources in mild climatic conditions which permitted long-term occupation of the site.



Gibraltar Neanderthals

FIGURE 2.85 The well-preserved intertidal community on the beach by Gorham's and Vanguard Caves includes many species of molluscs and other invertebrates that are recorded within the archaeological levels in the caves, providing further evidence of continuity of ecological function.

Limpets from Gorham’s Cave Late Pleistocene deposits have also provided a new source of information. Studying their seasonal growth rings and comparing them with present-day shells which are known to be excellent indicators of sea surface temperature (SST), it has been possible to model, for the first time, seasonal changes in climate at the time of the Neanderthals (Figure 2.86). Magnesium/Calcium (Mg/Ca) and oxygen isotope ($\delta^{18}\text{O}$) ratios in modern limpet (*Patella*) shells have been shown to record the seasonal range of Sea Surface Temperatures (SST) in the western Mediterranean, a region particularly susceptible to seasonal change. Analysis of fossil limpet shells from Gorham’s Cave showed that SST seasonality was greater during the last glacial by $\sim 2^\circ\text{C}$ as a result of greater winter cooling (Ferguson *et al.*, 2011). These results add further weight to the climate estimates using other faunal proxies and confirm the benign nature of the Neanderthal environment at Gibraltar during the Late Pleistocene.

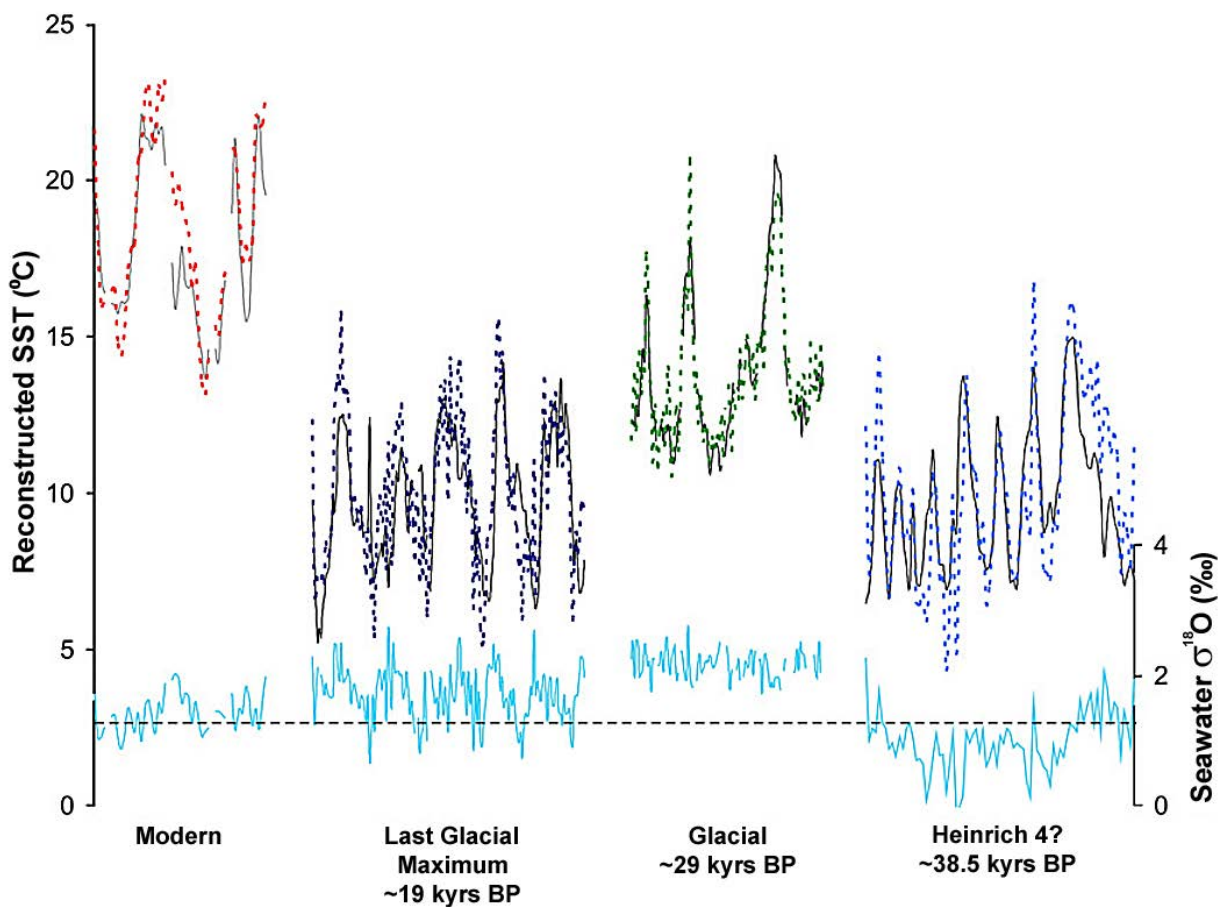


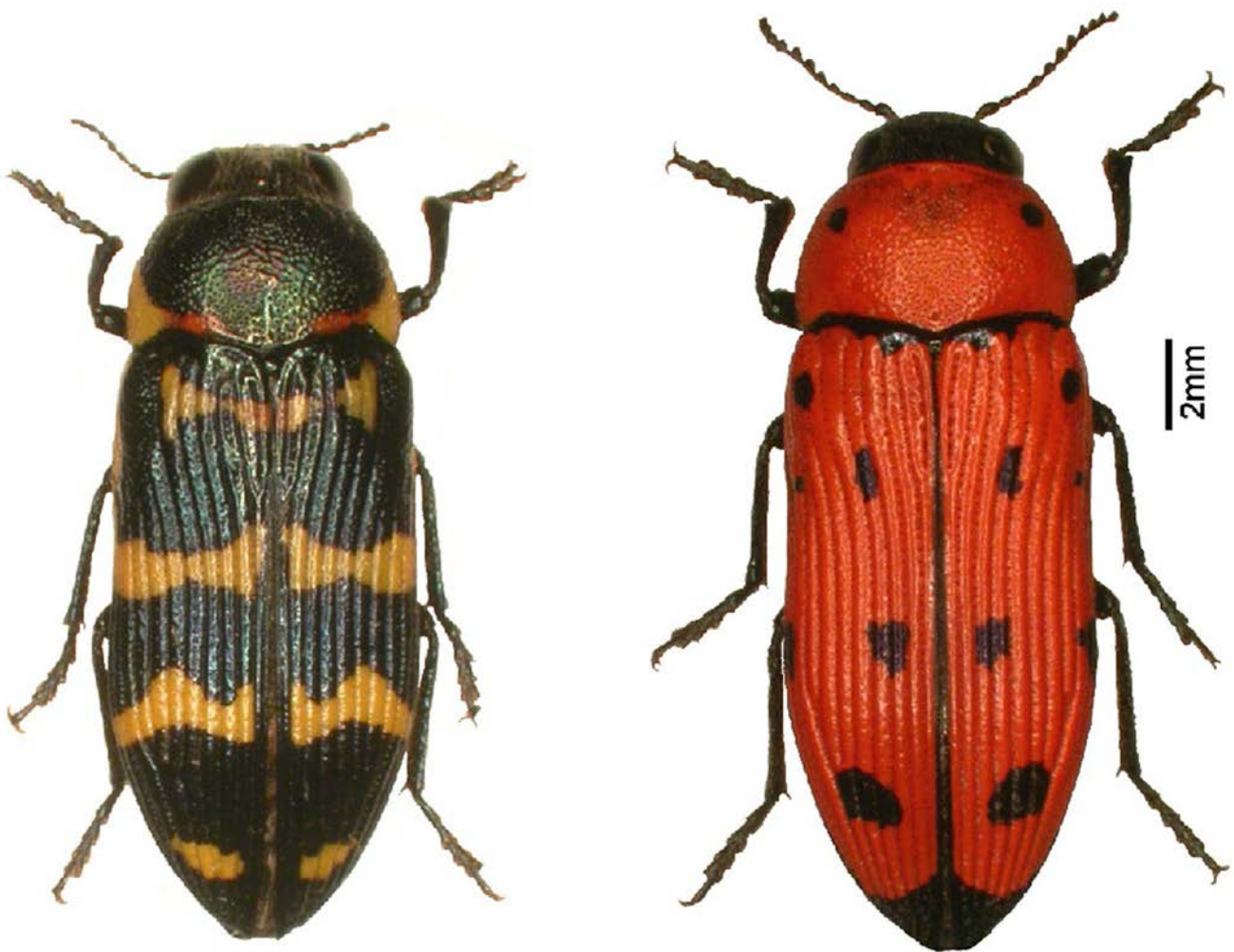
FIGURE 2.86 Analysis of fossil limpet shells from Gorham’s Cave showed that SST seasonality was greater during the last glacial by $\sim 2^\circ\text{C}$ as a result of greater winter cooling. From Ferguson *et al.*, 2011.

2.a.13 Terrestrial Mollusca

Ten taxa of terrestrial molluscs have been recovered from the cave deposits and at least seven of these are present within the property today (Appendix 1). They provide further support of the continuing dimension of the site's ecological function.

2.a.14 Insecta

Insects have not been identified from the cave record but a study is underway seeking to establish insect remains. There are, however, insects present today within the property which are expected to have been present at the time of the Neanderthals and therefore a part of their environment (Figure 2.87; Appendix 2).



**FIGURE
2.87**

Buprestis sanguinea ssp. calpetana male (left) and female. This sub-species is only known from Gibraltar. Its larvae feed within the stems of *Ephedra fragilis*, which is known from the fossil record.

2.a.15 Fortifications within the nominated property

Several fortifications are located within the site (Figure 2.88). They reflect its evolution since the 18th Century. They include a number of observation posts, gun positions and related structures (Rollo, 1990). Overall, they had little impact on the site values.

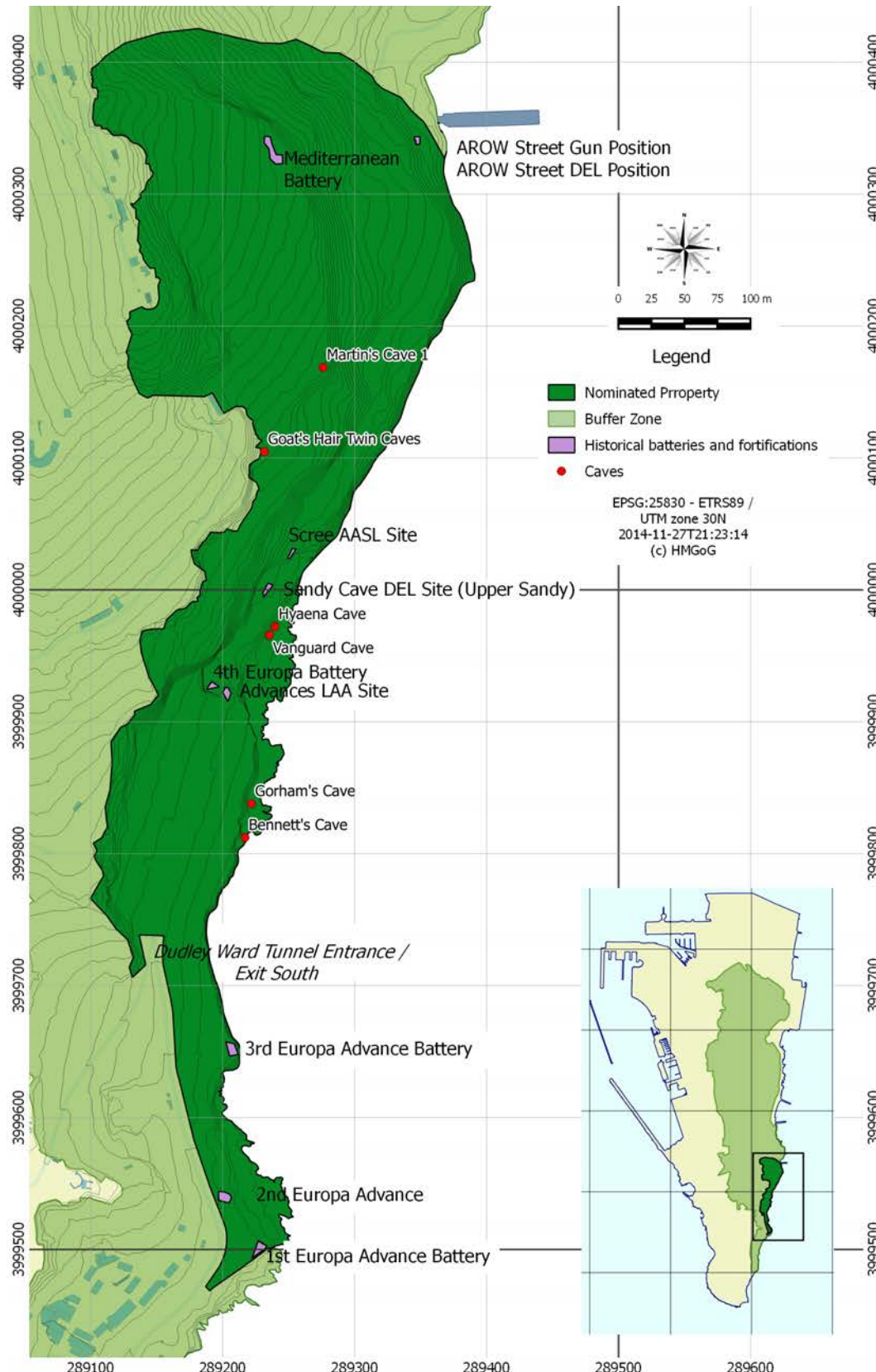


FIGURE 2.88 Location of historical batteries, other fortifications and tunnels within the nominated property.

The main ones are:

- (a) Advance Light anti-aircraft (LAA) Site – World War II
- (b) AROW Street Gun Position – World War II
- (c) AROW Street DEL Sites – World War II
- (d) Europa Advance Batteries – 18th Century to World War II. The complex consists of four batteries, three of which (Batteries 1-3; Figure 2.89) are proposed for conversion into viewing platforms overlooking the Gorham’s Cave Complex. The fourth was sited near Monkey’s Cave.
- (e) Mediterranean (or Martin’s) Battery – 19th Century to World War II (Figure 2.90).
- (f) Sandy Cave DEL Site – World War II
- (g) Scree AASL Site – World War II



**FIGURE
2.89**

Second Europa Advance Battery, overlooking the Gorham’s Cave Complex, circa 1860. Gibraltar Museum.



FIGURE 2.90

Mediterranean (also known as Martin's Battery) on the Mediterranean Steps, J. M. Carter, 1846. Note the Catalan Bay Sand Dune behind. Gibraltar Museum.

2.a.16 The site as a natural laboratory and archive

Putting together all the available evidence within the candidate World Heritage Site cave archive, it becomes clear that the site represents an exceptional natural laboratory in which to study the close interrelationship between climate, the environment and the Neanderthals in a place where they lived for 100,000 years.

Exceptionally, every trophic level, typically recognised to comprise a healthy ecosystem, is represented in the cave fossil record for each of the major habitat components, with the exception of the sea (Table 2.3 to Table 2.7). The archive is the unparalleled store of artefacts, hearths, engravings, animal and plant remains within the caves which will provide a source of information for present and future generations. The laboratory is the combination of the living community or organisms on site and their fossil remains, allowing an exceptional understanding and transmission of knowledge to the future.

The current research project is now in its 25th year. The painstakingly-retrieved information that has been obtained in this time is the basis of the current nomination. The global importance of the site is indicated by the wide range of disciplines and international institutions (44 in all) that have participated in this multi-disciplinary project (Appendix 3). The research which has been undertaken so far has included detailed taphonomic analysis of animal remains to determine the Neanderthal diet; analysis of charcoal from hearths, fossil pollen in sediment and hyaena coprolites to reconstruct the vegetation landscape; use of a wide range of dating techniques to provide a precise chronology; study of lithics and raw materials to understand dispersion patterns; study of present-day ecosystems to quantify aspects of the Neanderthal landscape; and geomorphological and geochemical studies that have provided the temporal and spatial setting of the site. In all, this research has painted the most complete picture of the Neanderthals in their ecological context that is currently available.

**TABLE
2.3**

Rocky habitat trophic chain representation in the cave fossil record. In this and Tables 2.4-2.7: M – Mammalia; A – Aves; R – Reptilia; Am – Amphibia, Mo – Mollusca; P – Plantae; species in **bold** are present today as residents, migrants or occasional visitors.

Trophic Level	Rocky Habitat
OBLIGATE SCAVENGERS	A : Lammergeier, Egyptian Vulture , Griffon Vulture
APEX PREDATORS	M: Neanderthal, Modern Human , Brown Bear A: White-tailed Eagle, Golden Eagle, Eagle Owl
TERTIARY CONSUMERS	M: Wild Cat A: Bonelli's Eagle , Lesser Kestrel, Kestrel, Peregrine Falcon , Horseshoe Whip Snake , European Shag , Northern Bald Ibis, Raven R: Southern Smooth Snake , Lataste's Viper
SECONDARY CONSUMERS	M: Greater Mouse-eared Bat , Natterer's Bat, Schreiber's Bat A: Barn Owl, Little Owl, Swift, Alpine Swift , Swallow , Crag Martin , House Martin , Alpine Accentor , Black Wheatear, Blue Rock Thrush Alpine Chough, Chough, Jackdaw, Rock Sparrow R: Moorish Gecko , Iberian Wall Lizard
PRIMARY CONSUMERS	M: Spanish Ibex A: Rock Dove
PRIMARY PRODUCERS	P: Juniper, Honeysuckle , Smilax , Wild Olive , Lentisc , Broom , Shrubby Hare's Ear , Buckthorn , Joint Pine

**TABLE
2.4**

Savannahs and shrublands habitat trophic chain representation in cave fossil record.

Trophic Level	Savannahs and Shrublands
OBLIGATE SCAVENGERS	A : Lammergeier, Egyptian Vulture, Griffon Vulture, Black Vulture
APEX PREDATORS	M: Neanderthal, Modern Human, Brown Bear, Lion, Spotted Hyaena, Wolf A: Golden Eagle, Eagle Owl
TERTIARY CONSUMERS	M: Leopard, Iberian Lynx, Wild Cat, Red Fox A: Red Kite, Black Kite, Northern Goshawk, Eurasian Sparrowhawk, Bonelli's Eagle, Common Buzzard, Hen Harrier, Lesser Kestrel, Kestrel, Hobby, Peregrine Falcon, Northern Bald Ibis, White Stork, Snowy Owl, Tawny Owl, Short-eared Owl, Raven R: Ocellated Lizard, Montpellier Snake, Horseshoe Whip Snake, Ladder Snake, Southern Smooth Snake, False Smooth Snake, Lataste's Viper
SECONDARY CONSUMERS	M: White-toothed Shrew, Pygmy Shrew, Crowned Shrew, Mole, Hedgehog, Wild Boar A: Red-legged Partridge, Common Quail, Great Bustard, Little Bustard, Stone Curlew, Lapwing, Woodcock, Barn Owl, Scops Owl, Little Owl, Red-necked Nightjar, Swift, Alpine Swift, Roller, Hoopoe, Green Woodpecker, Great Spotted Woodpecker, Calandra Lark, Short-toed Lark, Crested Lark, Woodlark, Skylark, Swallow, Crag Martin, House Martin, White Wagtail, Meadow Pipit, Tawny Pipit, Dunnock, Blackcap, Sardinian Warbler, Pied Flycatcher, Robin, Black Redstart, Northern Wheatear, Black-eared Wheatear, Blackbird, Mistle Thrush, Great Grey Shrike, Great Tit, Short-toed Tree Creeper, Azure-winged Magpie, Magpie, Jackdaw, Carrion Crow, Starling, Chaffinch, Hawfinch, Goldfinch, Common Redpoll, Greenfinch, Bullfinch, Sparrow, Ortolan Bunting, Yellowhammer, Corn Bunting Am: Tree Frog R: Large Psammmodromus, Schreiber's Green Lizard, Bedriaga's Skink, Western three-toed Skink
PRIMARY CONSUMERS	M: Rabbit, Hare, Wood Mouse, Dormouse, Vole, Horse, Narrow-nosed Rhinoceros, Red Deer, Giant Deer, Aurochs A: Rock Dove, Stock Dove, Wood Pigeon, Turtle Dove R: Hermann's Tortoise
PRIMARY PRODUCERS	P: Juniper, Stone Pine, Lentisc, Rock Rose, Broom, Cork Oak, Strawberry Tree, Heather

TABLE 2.5 Wetlands habitat trophic chain representation in cave fossil record.

Trophic Level	Wetlands
OBLIGATE SCAVENGERS	A : Egyptian Vulture, Griffon Vulture, Black Vulture
APEX PREDATORS	M : Neanderthal, Modern Human , Brown Bear, Spotted Hyaena, Wolf A : White-tailed Eagle, Golden Eagle
TERTIARY CONSUMERS	M : Iberian Lynx, Wild Cat, Red Fox A : Red Kite, Black Kite, Bonelli's Eagle, Common Buzzard, Hen Harrier, Kestrel, Peregrine Falcon, Purple Heron, Glossy Ibis, White Stork R : Stripe-necked Terrapin, Grass Snake, Viperine Snake, False Smooth Snake
SECONDARY CONSUMERS	M : Wild Boar A : Common Pochard, Tufted Duck, Water Rail, Spotted Crake, Common Coot, Collared Pratincole, Lapwing, Ringed Plover, Snipe, Black-tailed Godwit, Common Redshank, Dunlin, Black-headed Gull, Black Tern, Swift, Alpine Swift, Swallow, White Wagtail, Yellow Wagtail, Water Pipit Am : Iberian Ribbed Newt, Marbled Newt, Southern Marbled Newt, Painted Frog, MidwifeToad, Spiny Toad, Frog
PRIMARY CONSUMERS	M : Horse, Red Deer, Aurochs A : Barnacle Goose, Red-crested Pochard, Marbled Duck, Mallard, Teal, Gadwall
PRIMARY PRODUCERS	P : Tamarisk, Willow

TABLE 2.6 Coast and dunes habitat trophic chain representation in cave fossil record.

Trophic Level	Coast and Dunes
OBLIGATE SCAVENGERS	A : Egyptian Vulture
APEX PREDATORS	M : Neanderthal, Modern Human , Brown Bear, Spotted Hyaena, Wolf A : White-tailed Eagle
TERTIARY CONSUMERS	M : Red Fox A : Red Kite, Black Kite, Kestrel, Peregrine Falcon, Red-throated Diver, Great Cormorant, European Shag, Northern Gannet, Great black-backed Gull, Yellow-legged Gull, Snowy Owl, Short-eared Owl R : Ocellated Lizard, Montpellier Snake, Horseshoe Whip Snake, Lataste's Viper

SECONDARY CONSUMERS	<p>M: Wild Boar</p> <p>A: Slavonian Grebe, Shelduck, Long-tailed Duck, Common Scoter, Velvet Scoter, Red-breasted Merganser, Oystercatcher, Black-winged Stilt, Stone Curlew, Grey Plover, Ringed Plover, Black-tailed Godwit, Whimbrel, Eurasian Curlew, Common Redshank, Knot, Purple Sandpiper, Dunlin, Grey Phalarope, Black-headed Gull, Black Tern, Swift, Alpine Swift, Crested Lark, White Wagtail, Yellow Wagtail, Meadow Pipit, Black Redstart, Northern Wheatear, Black-eared Wheatear, Great Grey Shrike, Azure-winged Magpie, Magpie, Corn Bunting</p> <p>R: Spiny-footed Lizard, Bedriaga's Skink, Western three-toed Skink</p> <p>Am: Spadefoot Toad, Natterjack Toad</p>
PRIMARY CONSUMERS	<p>M: Rabbit, Vole, Red Deer</p> <p>A: Barnacle Goose</p> <p>Mo: Cockle, Clam, Cowrie, Limpet, Periwinkle, Top Shell, Mussel, Scallop, False Limpet</p>
PRIMARY PRODUCERS	<p>P: Juniper, Stone Pine, Lentisc, Rock Rose, Broom, Tamarisk</p>

TABLE 2.7 Sea habitat trophic chain representation in cave fossil record.

Trophic Level	Sea
OBLIGATE SCAVENGERS	
APEX PREDATORS	Modern Human
TERTIARY CONSUMERS	<p>M: Common Dolphin, Bottlenose Dolphin, Monk Seal, Atlantic Grey Seal</p> <p>A: Northern Fulmar, Cory's Shearwater, Balearic Shearwater, Northern Gannet, Great Skua, Arctic Skua, Great Auk, Guillemot, Razorbill, Little Auk, Puffin,</p>
SECONDARY CONSUMERS	A: European Storm Petrel, Kittiwake
PRIMARY CONSUMERS	
PRIMARY PRODUCERS	

2.a.17 The Buffer Zone

The buffer zone occupies an area of 313ha and comprises the Gibraltar Nature Reserve and two coastal strips, to the north and south of the property. The eastern side of the buffer zone, including the northern coastal strip, is situated below the ridgeline of the Rock and consists of sheer limestone cliffs and the Catalan Bay Sand Dune (Section 2.b.3). The western side of the buffer zone is gentler sloping and is covered in olive maquis vegetation which acts as a reservoir for the natural cliff vegetation and avifauna within the property. The southern coastal strip consists of cliffs and raised beaches away from the main ridge of the Rock. There are caves with Middle (Ibex) and Upper (Sewell's) Palaeolithic occupation within the buffer zone.

2.b History and development

2.b.1 General History

The Rock of Gibraltar is a globally recognisable feature. Situated where two continents (Africa and Europe) and two seas (Atlantic Ocean and Mediterranean Sea) meet; it has been a magnet for humans throughout recorded history. It has been a natural landmark set within this unique geographic context. This image of the Rock as a whole and seen from a distance, either by land, sea or air, constitutes the defining essence of the place and has provided a tangible canvas to the identity of the people who have made this their home.

The spectacular cliffs on the Mediterranean side of the Rock of Gibraltar constituted a famous landmark in the classical world, known as the northern Pillar of Hercules – *Mons Calpe* to the Romans - and signalling the end of the Earth. At the base of the highest peak, all mariners between the eighth and third centuries BCE were required to land and make offerings to the gods in a cave that we know today as Gorham's Cave. The interaction between the ancient Eastern Mediterranean mariners and the local indigenous people is recorded in the diverse array of ceramics and other artefacts in Gorham's Cave.

The Mons Calpe, the Pillar of Hercules, was a major geographical marker of the ancient world. Beyond this lay the unknown. Reference to its international dimension and symbolic significance is captured widely in the classical literature of outstanding universal significance, commencing with Homer's *Odyssey* (the Pillars of Atlas), as a marker beyond which lay Atlantis (Plato's *Timaeus* and *Critias*), and in various important geographical texts such as Herodotus' *History*, Avienus' *Ora Maritima*, Strabo's *Geography*, Pliny the Elder's *Natural Histories* and Diodorus Siculus' *Bibliotheca historica*. Its origins lie in Greek Mythology, in Herakles' tenth labour – the capture of the cattle of Geryon - during which he created the Pillars.

In the early eighth Century CE, the Rock marked the western edge of the territory of Islam. In 711 the Berber Tarik-ibn-Ziyad led a force across the Strait from North Africa and landed on the Rock. It marked the beginning of the conquest of Hispania and the start of the 781-year Muslim rule of al-Andalus. The spiritual and strategic significance of the cliffs and peaks of the Rock, the beacon and point of the first landing, to Islam were recognised in a new name for the *Mons Calpe*: since then it has been known as the Jebel Tarik, the mountain of Tarik - Gibraltar. The symbolic significance of Jebel Tarik to Islam is captured in a number of important texts, some of outstanding universal significance: Ibn Battuta's *Travels in Asia and Africa*, al-Idrisi's *Kitab nuzhat al-mushtaq* (Latin *Opus Geographicum*), al-Himyari's *Kita bar-Rawd al-Mi'tar*, Ibn al-Jatib's *Mi'yar al-Ijtyar* and Ibn Marzuq's *Musnad*.

If to Islam the Jebel Tarik was the bridge between Africa and Europe, to the British from the 18th Century onwards it was the bridge between the Atlantic Ocean and the Mediterranean Sea. Its strategic importance increased with the opening of the Suez Canal in 1869. This significance had as much to do with geology and topography as it had to do with geography: the cliffs and caves of the Mediterranean side of Gibraltar constituted a natural fortress which coined the universally-known phrase “strong as the Rock of Gibraltar”. The control of shipping between the Atlantic Ocean and the Mediterranean Sea was made possible through the exploitation of the advantage provided by these heights.

In spite of a history of conflict, which ended with the Second World War, the Neanderthal caves and other attributes of the property were unaffected. Having been under military control for decades, restricted access protected the site.

2.b.2 Caves and Neanderthals

The history of cave research in Gibraltar goes back to the 18th Century. This was the pre-Darwinian era, when a full understanding of the depth of evolutionary time was in its infancy. Work in the Gibraltar sites made a significant contribution to these early palaeontological studies, a contribution that was carried into the 19th Century when it became a major site of study for the leading palaeontologists of the day. It was then (in 1848) that the first Gibraltar Neanderthal skull was discovered, eight years before the specimen from the Neander valley in Germany.

The Reverend John White, brother of the famous Gilbert White of Selborne, was chaplain at Gibraltar during the 1770s. White collected many zoological specimens and kept detailed records, corresponding regularly with his brother and other famous zoologists of the day, in particular Thomas Pennant and Daines Barrington. White wrote a *Fauna Calpensis*, the first detailed zoological account of Gibraltar, which was sadly never published, with the manuscript now lost (Mullens, 1913). A major characteristic feature of the Rock of Gibraltar is the rich veins of breccias that date to the Middle and Late Pleistocene. Of particular significance are the Rosia bone breccias (Figure 2.91) that were the subject of detailed study by White and were known to the international community of the day, being a significant feature that was discussed in the evolution debate of the time. White described the breccias:

“Not far from hence, on the S.W. side of Rosia Bay, was discovered, in the year 1769, a huge mass of petrifications of a very singular kind. The workmen who were employed in scarping the face of the rock to render it less accessible, after having wrought, by mining, through about ten feet of solid limestone came to a vast congeries of bones, blended and consolidated together in a confused manner with limestone of various sorts, freestone, spars, selenites, stalactites and calcareous crystallizations and incrustations. This curious assemblage of animal and fossil substances incorporated together extended to the space of ten or twelve feet every way in front; vast quantities of it were blown off in the prosecution of the work, and much more remains in the body of the rock. All of it has the appearance of having been thus blended in a fluid state; the bones are so universally equally intermixed that the smallest fragment cannot be found but what has a proportion of bones, the inner surfaces and the very pores of which are frequently found incrustated with glittering concretions. These bones lie jumbled across each other in the utmost confusion, retaining their original texture and colour when separated from the calcareous substances wherewith they are cemented together. There is no room to imagine that any of these are human bones, they all seem, on examination, to be those of sheep, or goats, or both.”

The Rosia breccias are the type locality of the extinct rabbit *Prolagus calpensis* and form part of the Parson’s Lodge Interpretation Centre for the nominated World Heritage Site (Section 4.b.(iv)).



**FIGURE
2.91**

The Rosia breccias were the subject of detailed study by the Reverend John White and were known to the international community of the day, being a significant feature that was discussed in the evolution debate of the time.

Great interest and excitement about the geology and prehistory of Gibraltar was generated during the 19th Century following the discovery of rich deposits of bone breccia, as well as bones and human artefacts in caves in the limestone of the peninsula. The material recovered was considered to be of such great importance that it attracted the attention of famous names of the day, in particular Sir Hugh Falconer and George Busk. On the 3rd of March, 1848, Captain Edmund Flint, secretary of the Gibraltar Scientific Society presented a human skull to this body (Figure 2.92). The minutes of the meeting simply read:

“Presented a human skull from Forbes’ Quarry, North Front, by the Secretary...”

The skull was a fossilised human cranium found during work at Forbes’ Quarry, Gibraltar (Figure 1.1; Busk, 1865; Broca, 1869; Sollas, 1907). The skull was in fact that of a Neanderthal but this was not realized until eight years later when another was found in the Neander Valley in Germany, which gave the taxon its name: “Neanderthal Man” (*Homo neanderthalensis*) (King, 1864; Keith, 1911).

Gibraltar Neanderthals

In 1867, Captain Frederick Brome explored Martin’s Cave (Figure 2.48) and carried out archaeological excavations that produced a diversity of animal bones, pottery and flint knives (Brome, 1868). Captain Brome’s exploration is commemorated by a contemporary plaque at the entrance to this cave. The cave was later used to house military generators during the Second World War.

It was the virtual absence of information on the Gibraltar skull and the circumstances of its discovery that led to Dr W. L. H. Duckworth’s (Cambridge University) visits between 1910 and 1912. His stated objective was:

“to learn from personal observation and inquiry, so much as might be possible about the circumstances of the discovery of the now classical ‘Gibraltar Skull’ ” (Duckworth, 1911). Duckworth found very little but he did explore other caves on the Rock and excavated in Cave “S” – Sewell’s Cave (Duckworth, 1911).



FIGURE 2.92 The Gibraltar skull – Neanderthal from Forbes' Quarry, 1848.

The site of Devil's Tower produced the partial skull of a Neanderthal child in 1926 (Figure 1.1; Garrod *et al.* 1928). The famous French prehistorian L'Abbé Henri Breuil, who was Professor at the Institut de Paléontologie Humaine de Paris, visited Gibraltar in 1914 and, while walking along the north-eastern side of the Rock, noted that the brecciated talus he had observed should prove fruitful in investigating the existence of prehistoric Man at Gibraltar (Verner, 1919). Breuil returned in 1917 and examined the brecciated talus. At the time he was in the war service of the Naval Bureau and the French Embassy at Madrid and was employed on several occasions as courier between Madrid and Gibraltar (Breuil, 1922). He found animal bones and Mousterian implements but was prevented from exploring further by a military policeman. He returned yet again in 1919, on this occasion with a Governor's permit to excavate. He found conclusive evidence of use of the site by "Palaeolithic Man" (Breuil, 1922). At Breuil's instigation, Miss Dorothy Garrod conducted detailed excavations of the site between November 1925 and January 1927 - her results included the discovery of fragments of the skull of a Neanderthal child.

Gorham's Cave was discovered in 1907 by Captain A. Gorham of the 2nd Battalion Royal Munster Fusiliers, who opened up a fissure at the back of the cavity which bears his name. Subsequently, for convenience, both the cavern and the system of fissures came to be known as Gorham's Cave. The cave appears to have been forgotten after 1907, although it may have been visited sporadically by military speleologists. However, on 16 March 1945, Lieutenant George Baker Alexander, R.E., a graduate geologist from Cambridge University, arrived in Gibraltar and conducted a thorough geological survey of Gibraltar at this time, concluding with the production of a new geological map of the region (Rose and Rosenbaum, 1990). Alexander became the first person to excavate Gorham's Cave, along with his companion, Lt. Monke. Both set out to excavate the upper layer of the site. Subsequently, Professor Dorothy Garrod at Cambridge University, who had excavated Devil's Tower Rock Shelter in 1925-29, was invited to excavate Gorham's Cave. She was unable to undertake the work, and recommended Dr John D'Arcy Waechter, fellow of the British Institute of Archaeology, Ankara, to do so.

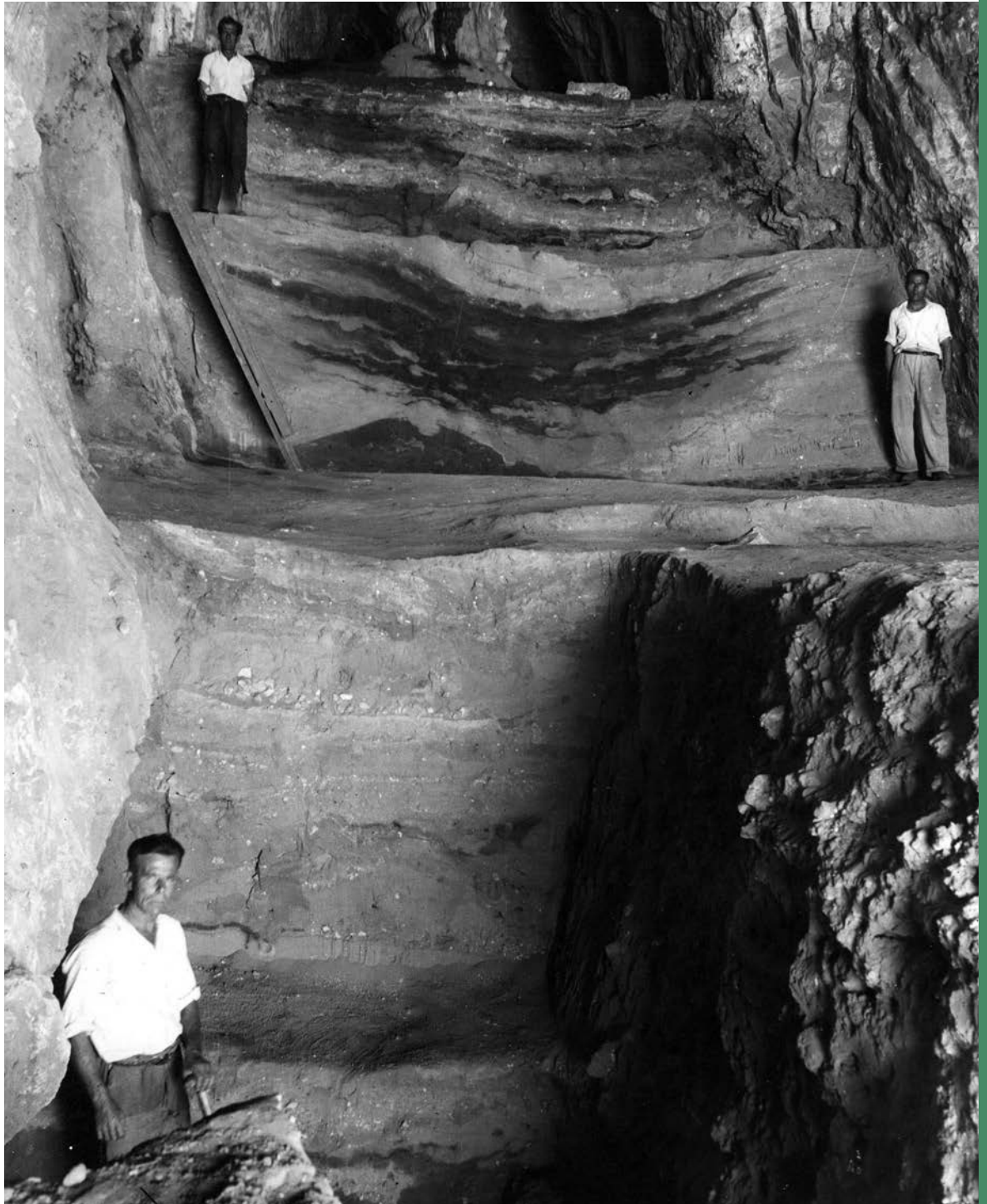


FIGURE 2.93

Excavations at Gorham's Cave by John d'Arcy Waechter, 1951-54. Gibraltar Museum.

Waechter's work (1951-54) represented the first large-scale excavations in Gorham's Cave (Figure 2.93) and established that it contained a record spanning perhaps 100,000 years of Middle Palaeolithic, Upper Palaeolithic and Holocene occupation (Waechter, 1951 and 1964). Waechter reported the presence of ancient hearths at various levels in the cave, and of faunal material throughout the sequence, dominated by the remains of ibex, rabbit and many species of bird.

The second phase of systematic excavations was carried out by a joint team from the Natural History Museum, London, led by Dr Christopher Stringer, and the British Museum, London, and by Ms Jill Cook, who visited Gibraltar in 1989. After preliminary excavations, the work developed as the 'Gibraltar Caves Project', jointly directed by the Gibraltar Museum and the Natural History Museum, London (Figure 2.94). Work until 1997 focused on the middle section of the cave, which had previously been excavated by Waechter (1951 and 1964). The excavations in the inner section of Gorham's Cave commenced in 1997 (Figure 2.95); their first results were published by Finlayson *et al.* (2006). Vanguard Cave was first excavated in 1995-98 as part of the Gibraltar Caves Project (Barton, 2000) and a second phase started in 2012 (Figure 2.96).



FIGURE 2.94 The second phase of excavations at Gorham's Cave commenced in 1989.

Of nine Neanderthal occupation sites in Gibraltar (Figure 2.97), four are within the nominated property. The five outside have suffered different fates through time. The site at Forbes' was quarried in the mid-19th Century - the activities producing the Gibraltar 1 skull – and only a remnant cave without archaeological deposits is left. The Devil's Tower Rock Shelter was fully excavated in the 1920s by Dorothy Garrod of Cambridge University. Beefsteak Cave has produced a small sample of Middle Palaeolithic stone tools in heavily cemented flowstone and dating to 90,000 years ago. Europa Point 1 is the naturally eroded remnant of a large cave and has also produced a small sample of Middle Palaeolithic stone tools embedded in the remains of the cave floor. Ibex Cave, a Neanderthal hunting and butchery site, in the eastern buffer zone was investigated in 1994 (Barton *et al.*, 1999). It is in fair condition. In contrast to these sites, those within the nominated property are in excellent condition, retain their character and have a large excavation potential.

The research at Gorham's and Vanguard Caves is at the cutting edge in this field and is making a major contribution to our understanding of Neanderthal ecology and behaviour, revealing hitherto unappreciated facts. Forty-four academic institutions from ten different countries have collaborated so far with the Gibraltar Museum in this project (Appendix 3). From 2002 to 2004 the project was partly funded under the EU Interreg IIIB Medoc Programme with collaborating institutions from the United Kingdom, Spain and Italy.



FIGURE 2.95 Excavations in the inner part of Gorham's Cave commenced in 1997.



**FIGURE
2.96**

Vanguard Cave was first excavated in 1995-98 as part of the Gibraltar Caves Project (Barton, 2000) and a second phase started in 2012.

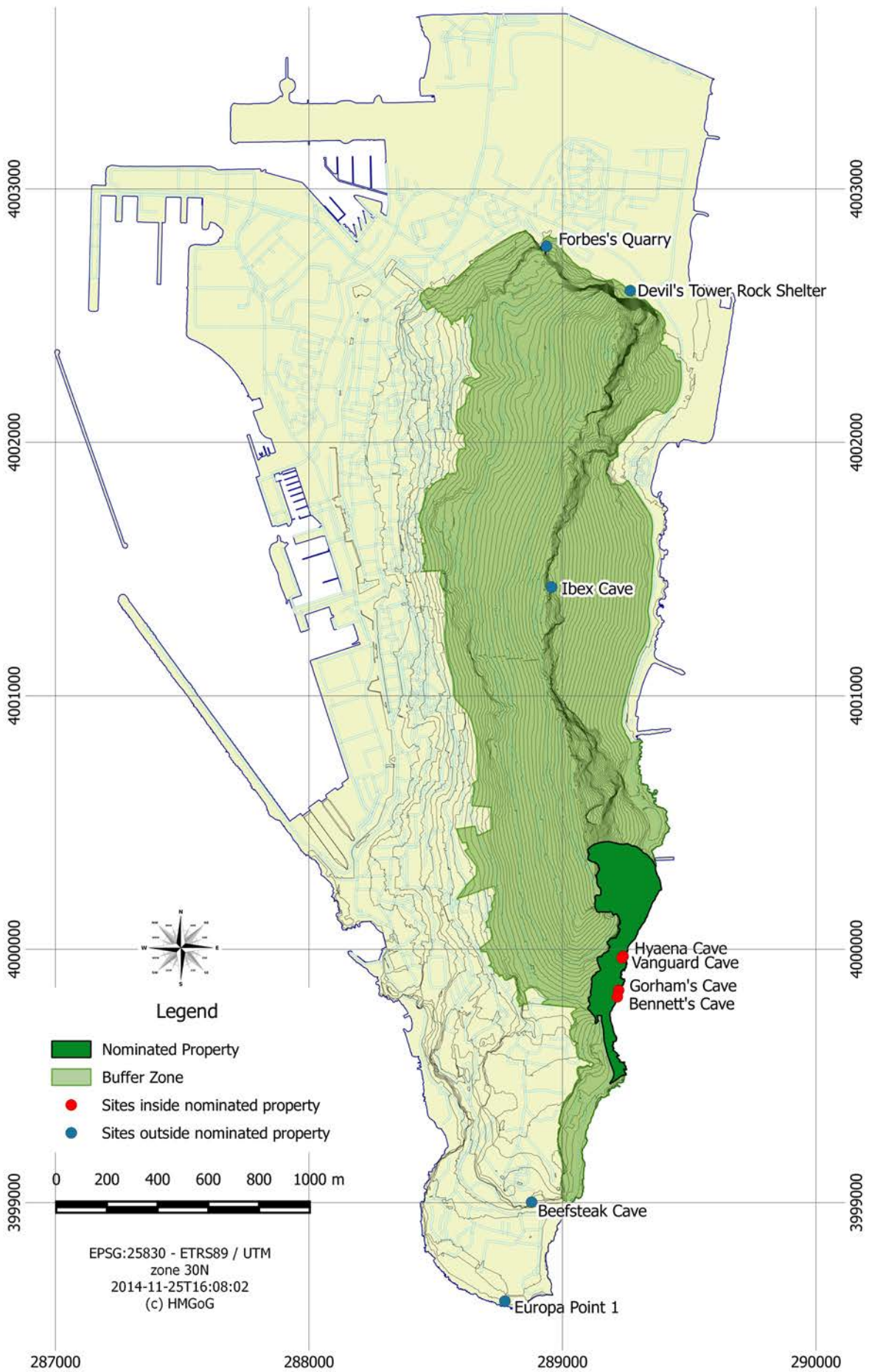


FIGURE 2.97 Neanderthal archaeological and fossil sites inside and outside the nominated World Heritage Site.

2.b.3 The Catalan Bay Sand Dune

The Catalan Bay Sand Dune was first described by John White in 1772:

"The Eastern side of the hill consists of an immense sloping bank of whitish sand interspersed with huge fragments of rock, and reaching from the sea nearly to the summit of the rock in some parts not far from the Signal House, and the Middle-hill Guards. These parts were formerly accessible, which made it necessary to keep constant guards there, as well to prevent desertions from within as a surprise from without. Of late years, much labour has been bestowed in making all these parts more abrupt and difficult, yet it is still necessary to watch them, as there are always some hardy adventurers who will wantonly risk their lives down these perilous cliffs, either in attempting to desert or in search of flowers."

Almost the entire (14ha) dune was covered by corrugated metal sheets that were laid between 1903 and 1961 for the purpose of collecting rain water (Figure 2.98). These sheets were placed on wooden frames which had minimal impact on the dune itself and which served to protect it from quarrying activities. They were prepared on a slope of continuously shifting sand which reached from the base of the cliff right down to the sea - at that time there was no road where Sir Herbert Miles Road is now positioned. To succeed in anchoring the sheets of corrugated metal, wooden frames were fixed into the sand and the sheets attached onto the wood. The system worked and maintained the population with an, albeit unpredictable, freshwater supply until the development of desalination plants in the 1980s removed the dependence on rainwater. The sheets were removed in 2001 and a programme of re-vegetation with autochthonous species was completed by the Gibraltar Ornithological and Natural History Society (GONHS) in 2006. The dune today presents a natural aspect and is an excellent example of habitat restoration (Figure 2.99). Given the degree of intervention to and modification of the dune in historic times, including the construction of a road at its base which cut its natural continuation to the sea, it was considered inappropriate to include the dune within the property boundaries, but it has been retained within the buffer zone.

The naturalist William Willoughby Cole Verner relates an interesting episode when in 1874 he attempted to reach the cliffs above the area which we now know as Governor's Beach (where Gorham's and Vanguard Caves are situated). He had to do so via Catalan Bay as the approach from Europa Point was practically impossible:

"...I proceeded to Catalan Bay. Here we lunched with the Detachment officer and afterwards started on our expedition. After a most fatiguing struggle across the great slopes of shifting sand we reached the first serious obstacle, a low cliff."

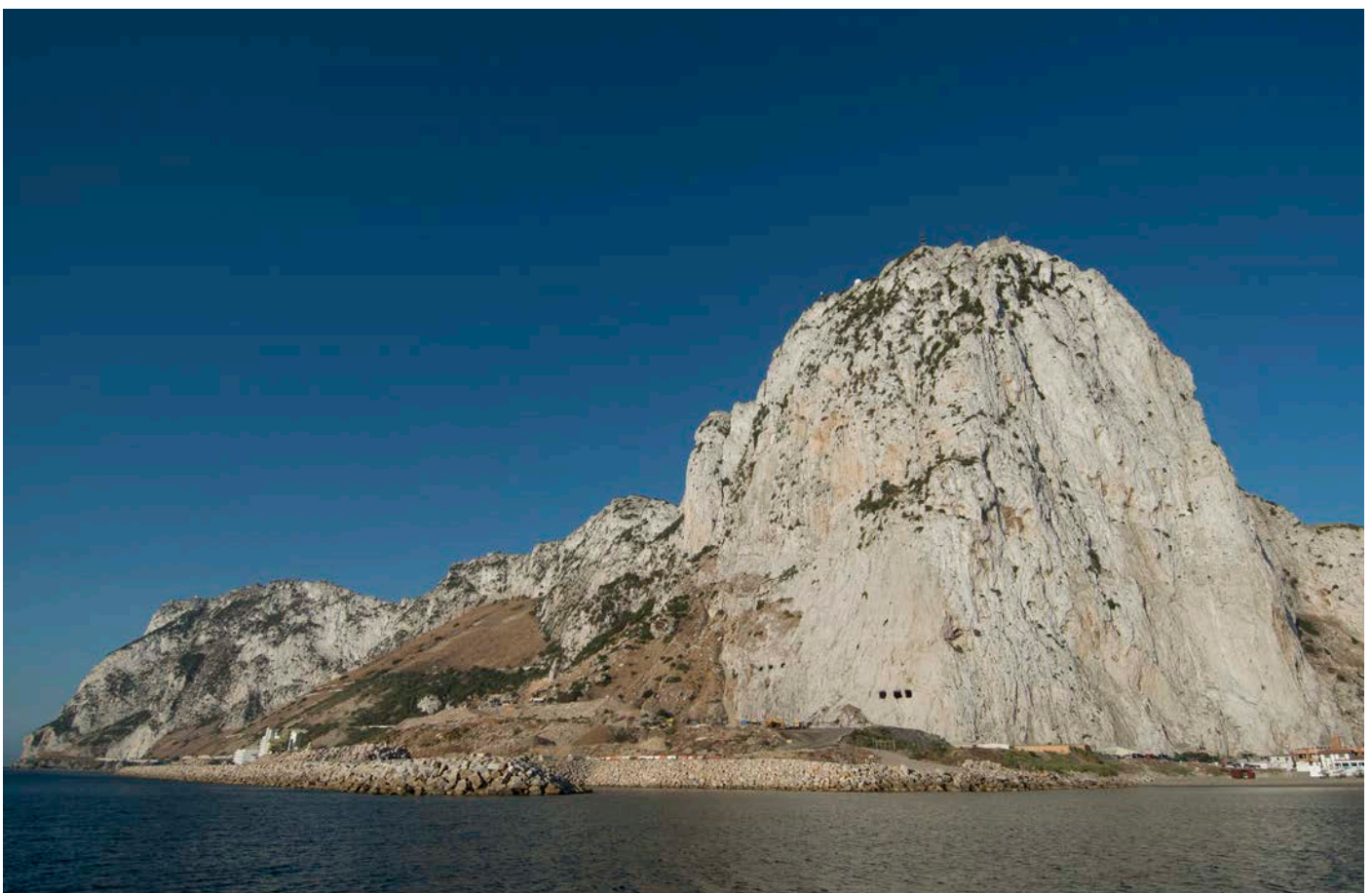


FIGURE 2.98 Almost the entire (14 ha) dune was covered by corrugated metal sheets that were laid between 1903 and 1961 for the purpose of collecting rain water. Image (above) shows extension to waterworks, July 1925 and (below) works in 1909. Gibraltar Museum.

The botanist, Kelaart (1856) described it like this:

“The approach to Catalan bay is, after leaving the garrison, by a road on the left of the bay-side guard; this road runs round the base of the northern side of the rock, having the neutral ground before it, and it terminates in a bridle-path, about a quarter of a mile from Catalan bay; this pathway is rather dangerous, from the nature of the sandy soil, and a deep precipice overhanging the sea on the left side of the road; danger is always to be apprehended from the rolling down of loose fragments of the rock, a casualty to which the little village is also liable...

Having gained the little fishing village, one might rest here a while, and see the fishermen drawing in their nets, and no doubt their contents will also be interesting to the naturalist. After this little variety he must be prepared to walk through nearly ankle-deep sand, in order to reach the small sandy bay beyond the village...”



Gibraltar Neanderthals

FIGURE 2.99 The dune today presents a natural aspect and is an excellent example of habitat restoration.

2.b.4 History of Tunnelling and Quarrying

Gibraltar has a long history of tunnelling dating back to the 18th Century. Major works were carried out between 1894 and 1906 for the construction of the Naval Dockyard on the western side of the Rock. The Admiralty Tunnel, running west-east from the dockyard to the east side, has its exit at the south-eastern corner of the Catalan Bay Sand Dune. Two quarries – Monkey’s and Catalan Bay - were opened on talus slopes on the eastern side, on either side of the Catalan Bay Sand Dune and a railway line followed the base of the dune but the dune itself was largely unaffected by these works (Figure 2.100).



**FIGURE
2.100**

Two quarries – Monkey’s and Catalan Bay - were opened on talus slopes on the eastern side, on either side of the Catalan Bay Sand Dune and a railway line followed the base of the dune. Gibraltar Museum

The base of the sand dune is currently bordered by Sir Herbert Miles Road which was built in 1917, and named after Gibraltar’s Governor between 1913 and 1919. The road replaced the track and railway line described above, built during the construction of the Dockyard. The track had already been replaced when the Admiralty Tunnel, directly linking the Dockyard with the east side just south of Sandy Bay, was excavated in 1898 (Figure 2.101).

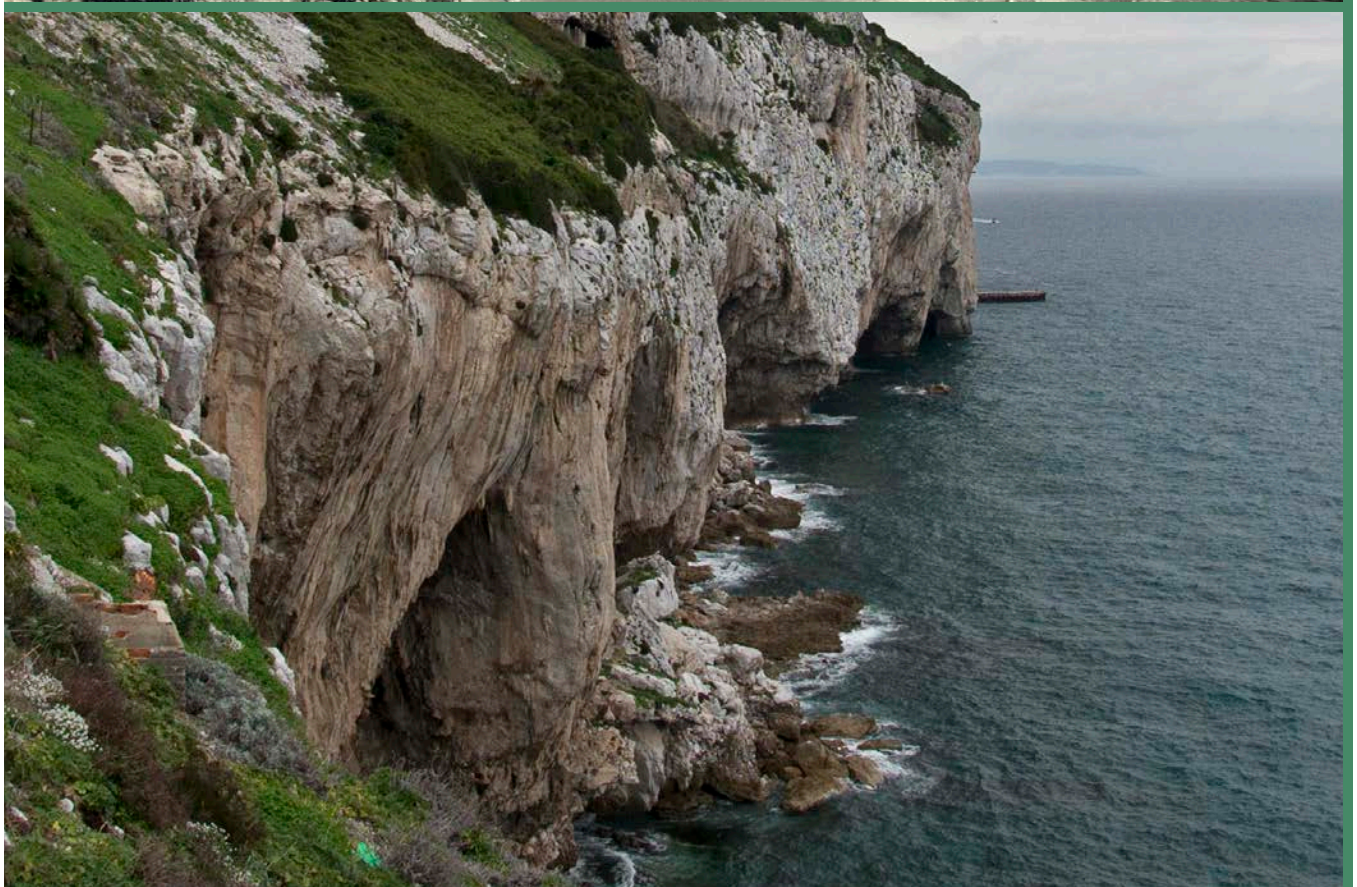
A tunnel linking Catalan Bay with the western side of Gibraltar was excavated in 1942 but is no longer in use. Williams Way Tunnel was named after Lt. Col. A. R. O Williams of 178 Tunnelling Company, Royal Engineers, who was in charge of tunnelling operations in Gibraltar during the Second World War. Williams has the distinction of having two tunnels named after him. Named using his initials, AROW Street runs parallel to Dudley Ward Way [tunnel] and was designed to take the largest trucks; it was completed on the 16th March, 1942. It is no longer in active use, Dudley Ward Way performing the task of linking the eastern side of Gibraltar from Sir Herbert Miles Road with the southern side at Europa Advance Road. Dudley Ward Way was excavated between 1956 and 1968 and is named after the Governor of Gibraltar between 1962 and 1965.

AROW Street links to other Second World War tunnels within Gibraltar and with the ammunition jetty which lies north of the Gorham's Cave Complex, outside the property. No longer in use, the jetty was built when the military ammunition storage facility was moved from the western side to the tunnels on the eastern side of Gibraltar following the explosion of the RFA Bedenham in 1951.

Minor quarrying at the top of the Catalan Bay Sand Dune, covering an area of <1ha took place in 1985 (Finlayson & Finlayson, 1999). It was this work, which was stopped shortly after, that exposed Ibex Cave which was subsequently excavated in 1994. Oil tanks, which were erected in the 1930s at the base of Monkey's Quarry, were dismantled as part of the removal of the water catchments. Spoil from tunnelling in the 1950s was deposited at the base of the cliff by Gorham's and Vanguard Caves, creating an artificial beach known as Governor's Beach. The beach has gradually eroded away and the site has now returned to the natural look which it had prior to tunnelling (Figure 2.102).



FIGURE 2.101 Admiralty Tunnel under construction, 1899. Gibraltar Museum.



**FIGURE
2.102**

Above: Spoil from tunnelling in the 1950s was deposited at the base of the cliff by Gorham's and Vanguard Caves, creating an artificial beach known as Governor's Beach. Left to right: Bennett's, Gorham's and Vanguard Caves, 1950s. Gibraltar Museum. Below: The same view today, from the Third Europa Advance Battery, with the coastline returned to its natural state.



FIGURE 3.1 There are significant components surviving to the present which provide a universally-unique opportunity to study and recreate the Neanderthal way of life in a natural context: Gorham's Cave.

3. Justification for inscription

3.1.a. Brief synthesis

The candidate World Heritage Site is an archive and a living laboratory that offers us an exceptional opportunity to understand the way of life of the Neanderthals. Its archival properties lie in the rich geological, palaeontological and archaeological evidence contained on its cliffs and in its caves and dunes. The continuing presence of many species that have been found as fossils in the caves enhances the archive and creates the perfect conditions for the site to act as a laboratory (Figure 3.1). Future investigation will be undertaken within a carefully-controlled research framework (Volume 4 of this Nomination) that will result in maximum results from minimum intervention and with a long-term objective of conserving a significant proportion of the deposits for future generations to study.

The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and 46 caves on the east side of the Rock of Gibraltar bordering the Mediterranean Sea. Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea-level rise and fall, some caves now being partly submerged and others offshore lying in the sea bed.

Exceptionally, given the abrupt relief, some caves – most notably Gorham’s and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years. Four caves have archaeological evidence of Neanderthal occupation and four of the first modern humans. They have generated a large body of information on the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique examples of the exploitation of birds and marine mammals for food. Gorham’s and Vanguard Caves have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. The caves have been excavated systematically over 25 years but vast deposits remain intact, retaining huge potential.

Lush Mediterranean vegetation and intertidal animals - species known to have predominated at the time of the Neanderthals - continue to cover the cliffs, slopes and rocky beaches. Resident birds, present when the Neanderthals lived here, still breed within the site while many migratory species rest or fly over the site during their annual migrations between Europe and Africa. Put together, all these elements offer the most complete picture of the Neanderthal world anywhere. Importantly, there are significant components surviving to the present which provide a unique opportunity to study and interpret the Neanderthal way of life in a natural context. The subsequent presence of early modern humans offers an excellent opportunity to compare the lifestyles of two human lineages within the same eco-geographical context, a comparison that is revealing great similarities between the two lineages and that is changing our view of the abilities of the Neanderthals. This extraordinary combination provides an exceptional and vivid picture of the Neanderthals, their way of life and environment, and gives the property its Outstanding Universal Value.

The following attributes give the site its Outstanding Universal Value:

- (a) Four caves – Gorham’s, Vanguard, Bennett’s and Hyaena – were occupied by the Neanderthals for 100,000 years. Together, they contain a rich archive of stone tools, remains of camp fires, bones, molluscs and pollen that permit a detailed reconstruction of climate and ecology, as well as Neanderthal behaviour, and changes through time (Figure 3.2). Two of these caves (Gorham’s and Vanguard) have been the subject of research over the past 25 years; the other two (Bennett’s and Hyaena) have been left untouched. Gorham’s and Vanguard Caves have 18- and 17-metre deep sequences respectively and thus have an extraordinarily high potential for further research. The material from the excavations includes the largest collection of fossil bird species from this period anywhere in the world (150 species). The evidence from these caves is permitting a reappraisal of Neanderthal cognitive capacities and subsistence economy. In addition to having provided the first clear evidence of abstract thinking by the Neanderthals in the form of a rock engraving, they have also demonstrated the active selection by the Neanderthals of birds of prey and crows with black feathers, hinting at previously unsuspected behaviour patterns indicative of symbolism and ornamentation. The research in Gorham’s and Vanguard Caves has also revealed, for the first time, the regular exploitation of birds and marine animals for food with clear evidence of processing including cooking. Approximately 70% of the archaeological deposits at Gorham’s Cave, 90% of those at Vanguard Cave remain unexcavated. The adjacent Bennett’s and Hyaena Caves hold significant potential for future research within the terms of the research framework and are currently left untouched in reserve.
- (b) Gorham’s Cave also provides complementary comparative evidence of the first modern humans in the area. In addition to stone tools, camp fires and palaeontological material, Gorham’s Cave has revealed examples of mobile and parietal art dating back to at least 20,000 years ago. Martin’s Cave has parietal art and evidence of early modern humans as do the Goat’s Hair Twin Caves.
- (c) The 426-metre high Jurassic limestone cliffs within the site provide a unique record of sea-level change, with evidence of fossil beaches at 5m above present sea level (Figure 3.3), and tectonic uplift, with raised beaches, dunes and scree slopes at different levels up to 210m AOD. The cave sequences are therefore embedded in a wider time frame which is recorded by the geological formations within the site, currently estimated at around 3 million years, and encompass the entire Quaternary and part of the Pliocene.
- (d) Pollen and charcoal evidence from Gorham’s and Vanguard Caves has shown that many of the plant species growing on the limestone cliffs and ledges today were also present when the Neanderthals lived on the Rock. The well-preserved vegetation on Mediterranean Steps and adjacent cliffs on the site provides a living testimony of the world of the Neanderthals and the functions of the ecosystems of which they were a part.

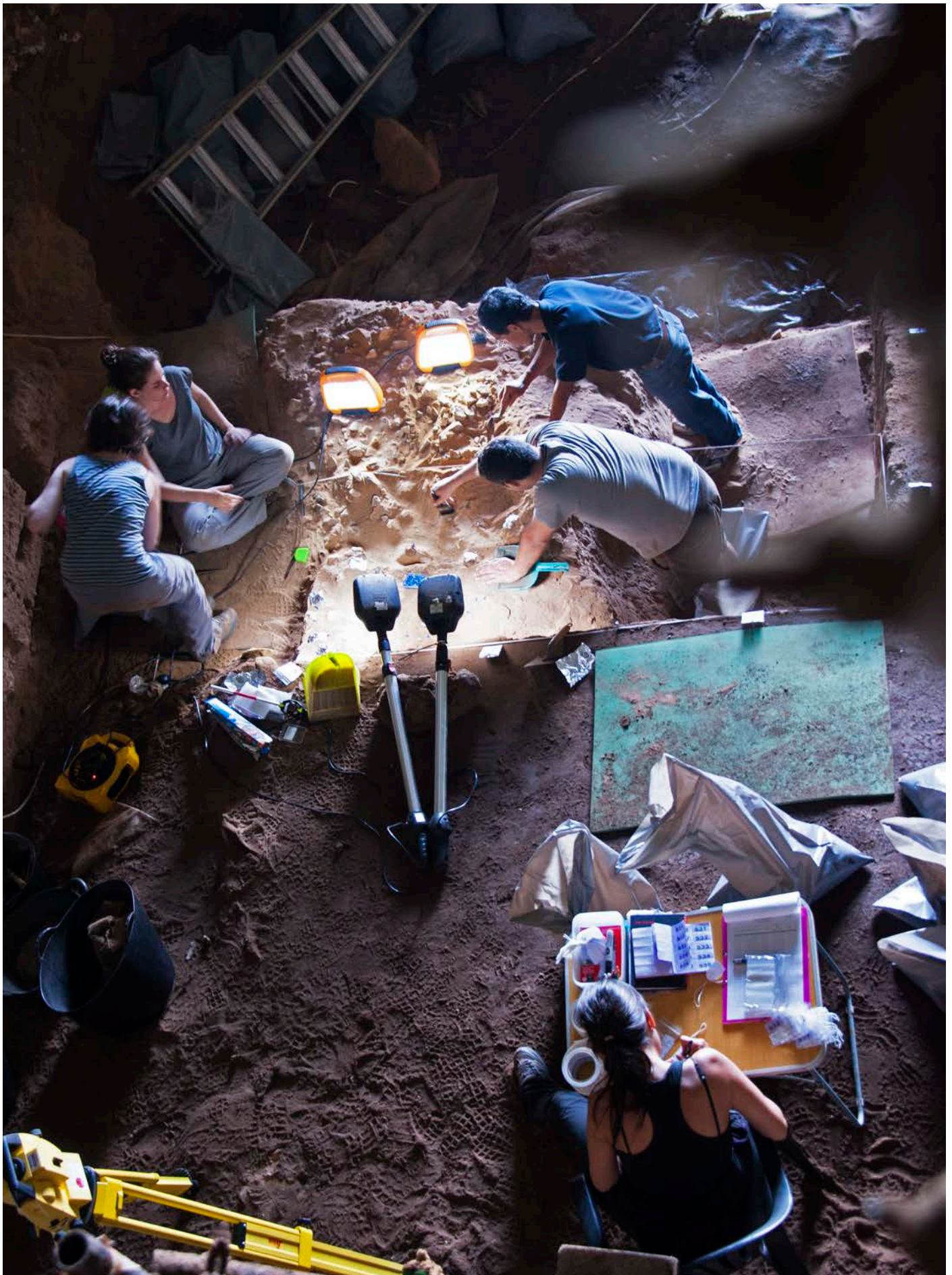


FIGURE 3.2

Four caves – Gorham’s, Vanguard, Bennett’s and Hyaena – were occupied by the Neanderthals for 100,000 years. Together they contain a rich archive of stone tools, remains of camp fires, bones, molluscs and pollen that permit a detailed reconstruction of climate and ecology, as well as Neanderthal behaviour, and changes through time. Photograph shows excavation in progress in Gorham’s Cave.



FIGURE 3.3 Fossil beaches at Gorham's Cave indicating former sea-level high-stands.

(e) Today there is a recurring presence of large numbers of birds, many of species recorded as fossil contemporaries of the Neanderthals in the caves, which utilise Gibraltar as a point of transit during their annual migrations between Europe and Africa as they would have done at the time of the Neanderthals. There are, additionally, several cliff-nesting resident birds which appear to have lived here since the time of the Neanderthals. Offshore, cetaceans and fish (including tuna), also recorded within the caves as fossils, continue their presence and migrations between the Atlantic Ocean and the Mediterranean Sea. Bats, of species also found in the fossil record, also continue to visit the site today. Put together, a uniquely substantial proportion of the fauna that existed at the time of the Neanderthals remains observable today as are some ecological processes, especially connected with migration.

(f) A well-preserved intertidal community of organisms on the rocky beach by Gorham's and Vanguard Caves with many species which are recorded inside the caves as having been consumed by Neanderthals and early modern humans during the Late Pleistocene (Figure 3.4).



FIGURE 3.4 A well-preserved intertidal community of organisms on the rocky beach by Gorham's and Vanguard Caves with many species which are recorded inside the caves as having been consumed by Neanderthals and early modern humans during the Late Pleistocene. Photograph shows a fossil and living specimen from Gorham's Cave and the beach outside the cave.

There are attributes which do not form part of the property but which provide contextual information about location, setting, use and function of the site itself. These associative attributes therefore have a direct bearing on and support its Outstanding Universal Value:

(g) Submerged landscape features and a large fossil sand dune – the Catalan Bay Sand Dune – which are relics of the Neanderthal landscape when sea levels were lower than today (Figure 3.5). The submerged features include Flysch pinnacles at -30m, which are associated with freshwater springs, indicative of the wider landscape at the time of the Neanderthals and of the presence of coastal oases. These features have been modified to some degree by human activity, particularly in relation to the Second World War, but they are of sufficient contextual importance to be considered associative attributes.

(h) The rich collections of artefacts and fossils excavated over the past 25 years as well as material from earlier excavations. These collections are housed in the Gibraltar Museum which is situated just 4.5km from the Gorham's Cave Complex (Figure 3.6).



FIGURE 3.5 A massive fossil sand dune – the Catalan Bay Sand Dune – reaches 290m AOD and is a relic of the ancient landscape of the Neanderthals when sea levels were lower than today and sand piled up against the Rock.



FIGURE 3.6 The collections are housed in the Gibraltar Museum which is situated just 4.5 km from the Gorham's Cave Complex.

3.1.b. Criteria under which inscription is proposed

The criteria which are proposed for inscription underpin the two main qualities of this exceptional site: (a) its ability to provide a long and detailed, high resolution, record of Neanderthal behaviour and ecology spanning an entire glacial period, including unique and outstanding examples of rock engravings and the exploitation of birds and marine mammals; and (b) its diverse and extensive contextual characteristics which vividly situate the world of the Neanderthals. Together, they uniquely tell the story of the Neanderthals. To this we may add the comparative value of the behaviour of the first modern humans who arrived at the site and subsisted in the same context as their predecessors had done for 100,000 years. The site complements the Mount Carmel World Heritage Site, the only site currently on the World Heritage List that represents the Neanderthals. Mount Carmel records an early phase of the Neanderthal story and also the first contact between Neanderthals and modern humans between 130,000 and 100,000 years ago and Gibraltar complements Mount Carmel, covering the later phases of the Neanderthals, from 127,000 years ago onwards, and also adds unique and exceptional information about Neanderthal behaviour and ecology (see Section 3.2).

Criterion (iii)

Paragraph 77 of the Operational Guidelines for the implementation of the World Heritage Convention states that: “The Committee considers a property as having Outstanding Universal Value if the property bears a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared”.

Criterion (iii): The site provides an exceptional testimony to the Neanderthals, a people and their cultural traditions, who are now extinct. Rock engravings, stone tools, hearths, bones with cut marks and evidence of burning, and molluscs showing fracture marks made with stone tools are the primary evidence of the Neanderthals. A rich array of fossil vertebrates (including the highest avian species diversity of any site), molluscs, pollen and charcoal provide the climatic and ecological context for Neanderthal and subsequent early modern human occupation. The enormous depth of archaeological and palaeontological deposits in Gorham’s and Vanguard Caves spans 125,000 years. An outstanding high-resolution record thus allows comparisons across a huge time span and permits analysis of stasis and change in cultural traditions. The quality of resolution allows understanding of the daily activities of the Neanderthals, including their capacities for abstract thinking. The spatial distribution of sites permits a detailed understanding of how the Neanderthals exploited their territory. The present environments of the site contain plants and bird species which shed light on this lifestyle. Our knowledge of the abilities and cultural traditions of the Neanderthals has changed decisively as a direct consequence of the evidence provided by this incomparable site.



FIGURE 3.7 The site's Outstanding Universal Value is in providing an exceptional testimony to the Neanderthals – a people and their cultural traditions – who are now extinct and of the earliest modern humans who followed them. Photograph shows Vanguard Cave from the sea.

Criterion (v)

Paragraph 77 of the Operational Guidelines for the implementation of the World Heritage Convention states that “The Committee considers a property as having Outstanding Universal Value if the property is an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change”.

Criterion (v): The site is of Outstanding Universal Value because its topography, geological features, natural cliff vegetation and rocky shoreline communities, afford a clear vision of a place which was once home to the Neanderthals. Nowhere is the relationship of the Neanderthals and their environment more palpable than it is in this site. It offers important features that allow us to understand and interpret the traditional lifestyle of the Neanderthals in their environment, and also to compare it to that of early modern humans. Part of this landscape was subjected to irreversible change with sea level rise 10,000 years ago; ancient raised beaches, scree slopes, shorelines and dunes within the site are reminders of the dynamic and precarious nature of a coastal world that was in a constant state of flux. The evidence in the caves enables us to understand how Neanderthals and modern humans adapted to these changes, varying their subsistence strategies as opportunities arose. The incomparable topography of the Rock of Gibraltar, as well as its modern-day flora and fauna, with many species still present from ancient times, opens up an exclusive window into the lost world of the Neanderthals.

3.1.c. Statement of integrity

All the elements which are necessary to convey and express the Outstanding Universal Value of the site, retain their characteristics and are undamaged are contained within the property. The property boundaries were chosen to follow topographical features that enclosed all attributes within the property. These elements are, in effect, the attributes of the site: caves and their content, tall limestone cliffs, fossil sand dunes, fossil beaches, scree slopes and living species. The boundary of the property, and hence its size, has been defined by these elements and ensure the site's integrity. Overall, at present the site retains a coherence and integrity which permits a full understanding of its character.

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The boundaries follow natural topographical features that incorporate the complete series of attributes that gives the site Outstanding Universal Value. The geological and archaeological attributes are exceptionally well-preserved while a significant proportion of the flora and fauna present in the Palaeolithic is still present today. In addition to their intactness, the attributes have a clear coherence within the boundaries of the property. The inclusion of a significant area surrounding the caves makes it possible to understand more fully the ways in which the Neanderthals interacted with their surroundings; it also guarantees that the nominated property is of adequate size to ensure the complete representation of the features and processes that convey its significance. Risks affecting the property are largely related to long-term climate change and sea level rise; shorter term risks with natural fires and rock falls; they are considered to be low and are closely monitored. The attributes are not threatened by development, deterioration or neglect. A combination of legal protection, active management, vertical scale and topography minimises risk to the property, which can only be appreciated if its dynamic character is fully understood.

In spite of the high density of population in Gibraltar, the property retains its natural character and is set within the boundaries of an existing nature reserve. The abrupt topography of the site and its massive scale, with cliffs rising from sea level to a maximum of 426m (Figure 3.7), have ensured its relative remoteness through centuries which have included fourteen sieges and an active military participation in two world wars. These vertical and near-vertical surfaces acted as reservoirs of native plants when the vegetation in other parts of Gibraltar had been levelled (Finlayson & Finlayson, 1999). The geological attributes of the property have also remained intact as a result. The archaeological deposits retain their integrity with the complete stratigraphic sequence of human occupation represented within the property.

Potential risks today, to a property close to a high population density, derive largely from development pressure and damage from access-related problems (e.g. vandalism, collection of rocky shore molluscs). There is no risk of development within the site itself because of its legal protection and also the abrupt nature of the terrain. The buffer zone is largely within a nature reserve which means that the risk of inappropriate development in the setting of the property is low. The scale of the site acts as a buffer in its own right. Access is monitored and the most sensitive parts of the site have restricted access.

Other potential vulnerabilities result from the very nature of the site. Being naturally vegetated in a Mediterranean climate with dry summers means that there is always the risk of summer fires which are part of the dynamics of the environment which is being preserved (Figure 3.8). This dynamism, which has been a defining feature of the site since its very origins, extends to rock falls during the rainy season. In the longer term, the site's dynamic nature is expressed through changes in sea level. Potential human-induced sea level rise, and the consequent impact of wave erosion on cave deposits, is not considered an immediate risk but coastal protection in the medium term is under consideration and is incorporated into the site's management plan. Having parts of the site on the coast also means that, as in any other coastal site, the risk of an oil spill from a passing ship cannot be fully discarded. Established contingency plans have been historically in place for such emergencies as summer fires and oil spills (Figure 3.8).



FIGURE 3.8 Being naturally vegetated in a Mediterranean climate with dry summers means that there is always the risk of summer fires which are part of the dynamics of the environment which is being preserved. The last fire on the dune is recorded in this photograph dated 13th August, 2005.

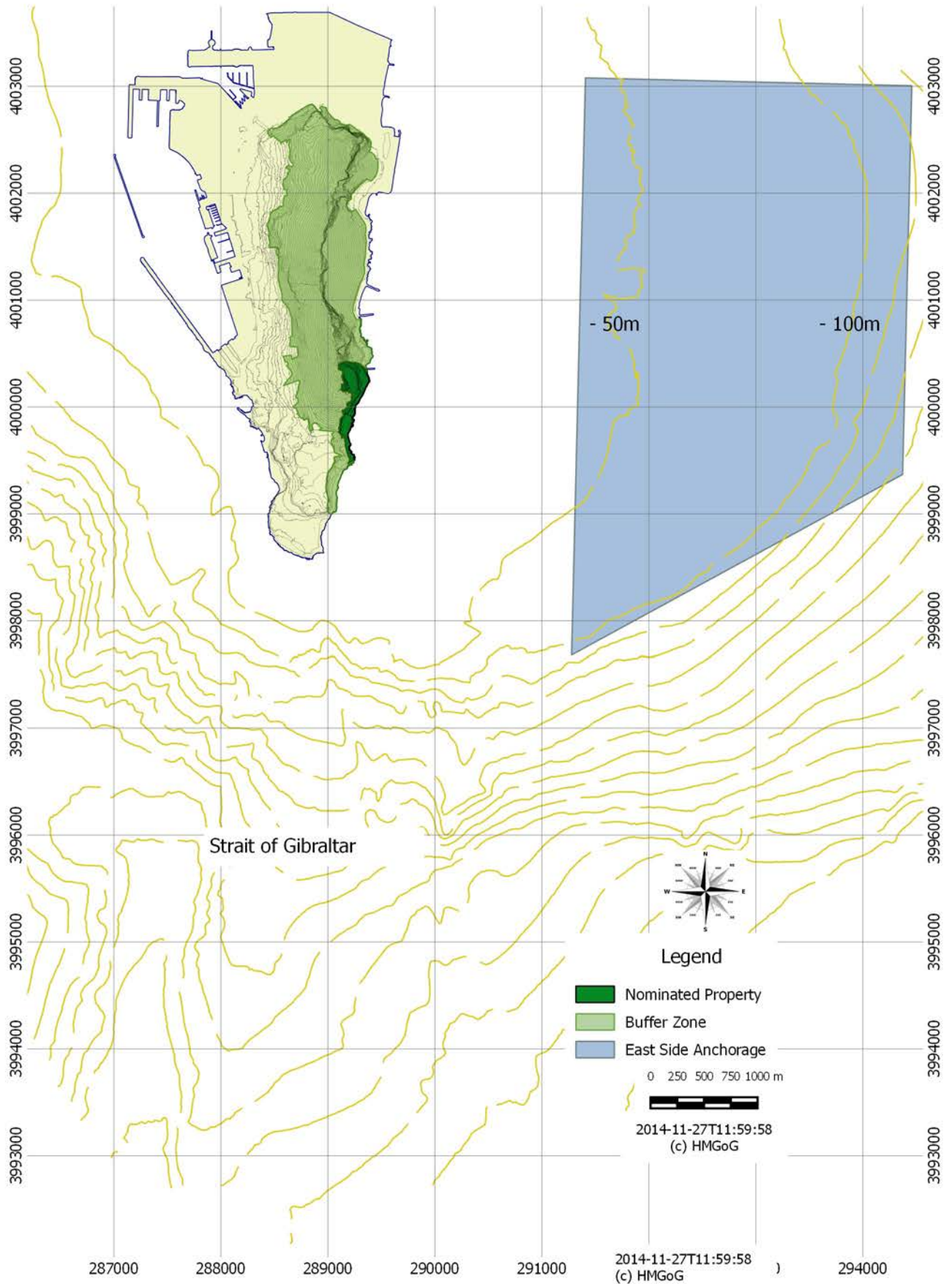


FIGURE 3.9 Map of proposed World Heritage property with location of permitted anchorage, showing how the area off the site, including submerged features, is free from anchorage and associated impacts.

3.1.d. Statement of authenticity

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning at two different levels:

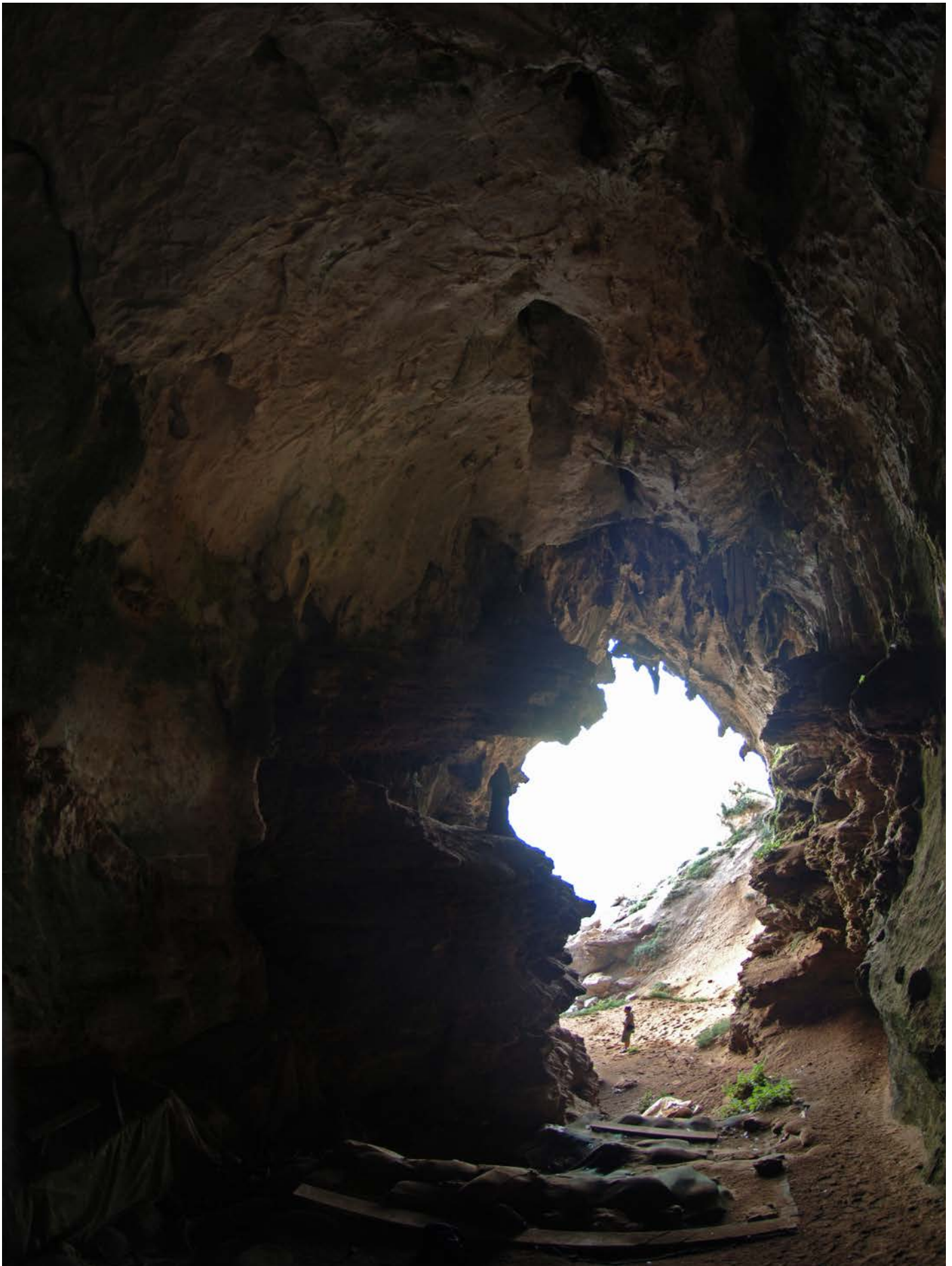
- (a) The individual attributes, particularly Gorham's and Vanguard Caves, that convey specific information about particular aspects of the site (Figure 3.10) through their materials and substance; and
- (b) The whole property and how it conveys value through an overarching authenticity of location and setting and the materials and substance of its geology, archaeology, flora and fauna.

These attributes, individually and in combination, guarantee authenticity of substance through the material culture present and excavated from the site and also from its physical attributes. The remaining archaeological deposits in the caves (over 90%) are wholly authentic in material and substance, as are the geological formations underpinning the property and its value. The biological components – cliff vegetation, intertidal organisms, birds and other animals – are natural within the property and have not been introduced. The authenticity of the information derived, forming the basis of site's meaning, is guaranteed through an extensive list of publications in the international, peer-reviewed, literature (see Bibliography) and by the surviving deposits. This information also serves to document and understand the continuing functions (vegetation dynamics, geological erosion and sea level interplay, bird migration systems) of the site and its former use by Neanderthals and the first modern humans to reach the area. Importantly and exceptionally, the information obtained is opening a window into the traditions of the Neanderthals and crucially, via the long temporal sequences available, is providing a detailed documentation of changing traditions (e.g. in stone tool technology and in resource exploitation) over time.

The evidence presented in this dossier shows that the authenticity of location and setting of the property, through its attributes, allows for a clear understanding of a place which had been occupied by people – Neanderthals and modern humans – for millennia. Though more difficult to demonstrate, the impressive topography and setting, is highly suggestive of a location that would have had spiritual meaning to the earliest inhabitants, just as it did to later generations (e.g. Phoenicians and Carthaginians) who recorded that sense and even used the site to make offerings to the gods.

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning. These attributes fall into three distinct categories:

- 1) the stratified deposits within the caves which contain a wealth of information that situates the site in a time framework are wholly authentic in material and substance. They contain engravings, artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first modern humans.
- 2) the form and substance of the caves themselves, their location and setting, the surrounding cliffs, their geological formations and the tangible evidence of climate and sea-level change (ancient beach levels); and
- 3) well-preserved relict cliff vegetation and faunal elements that have a direct connection with the vegetation that grew on these cliffs when Neanderthals and modern humans lived in the caves.



**FIGURE
3.10**

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning at two different levels: (a) the whole property and how it conveys value through an overarching authenticity; and (b) the individual attributes that convey specific information about particular aspects of the site. Photograph shows Gorham's Cave from inside.

3.1.e. Protection and management requirements

Gibraltar has a long tradition of heritage protection which was first formalised in 1930 with the Museum and Antiquities Ordinance. The present Gibraltar Heritage Trust Act 1989 is the direct descendant of this early statute. Nature protection legislation dates to the Nature Protection Act 1991, although there were earlier statutes protecting wild birds, etc. The Nature Protection Act prescribes the constitution of a Nature Conservancy Council and allows for the creation of protected spaces. The Gibraltar Nature Reserve, which includes the property and a large area of buffer zone, is designated under this Act. There is also a long tradition of community involvement in nature and heritage conservation. The Gibraltar Ornithological and Natural History Society (GONHS) is an active NGO involved in nature protection and has its origins in the 1970s. The Gibraltar Heritage Trust is a statutory NGO with its origins in the first Heritage Trust Ordinance of 1987.

In the long term, the site will remain fully protected and management systems will be reviewed every five years with a view to improving areas where considered necessary. There will also be a five-year review of the research strategy with annual monitoring and reporting of excavations. Visitor numbers to sensitive parts of the site will be restricted and closely monitored with an annual review of carrying capacity for areas within the property according to their sensitivity. Enforcement of access restrictions to the most sensitive parts of the property will be reviewed annually, or more frequently on an *ad hoc* basis if needed, and the use of non-intrusive monitoring technology will be applied and improved as technology develops. Measurement and assessment of risk will be a regular aspect of the management of the property with the emphasis on preparedness and rapid response should circumstances change. The levels of resourcing, including staff levels, will be reviewed annually as part of the presentation of annual estimates of revenue and expenditure to H.M. Government of Gibraltar.

Ownership of the site rests with Her Majesty's Government of Gibraltar which has appointed the Gibraltar Museum, through its Director, as manager. A small section of the site is owned by the UK Ministry of Defence. All the key attributes of OUV are entirely situated within HMGoG-owned (non-leased out) land. The site has full legal protection as part of the Gibraltar Nature Reserve; individual caves are also Schedule 1 Category A (maximum protection) sites under the Gibraltar Heritage Trust Act. Additional protection is provided by the Town Planning Act. Access to fragile caves is strictly controlled, permitted only with a guide approved by the Gibraltar Museum Director. The Mediterranean Steps are open to the public and are maintained with interpretation; the relict vegetation along the cliff walk is not threatened. Wildlife is protected through the Gibraltar Nature Reserve Act. Visitor numbers to sensitive parts of the site are and will be restricted and closely-monitored. Systems of access control will be updated as technology improves. Archaeological excavations are managed to ensure no loss of site integrity. An international committee of experts reviews relevant plans from the perspective of conservation, maintenance of site integrity and academic standards.

A Steering Committee is guiding the process of nomination; this Committee will become an Advisory Forum if the property is inscribed. Non-governmental organisations (Gibraltar Ornithological and Natural History Society; Gibraltar Heritage Trust) with site interests are directly involved in management processes. A dedicated multi-disciplinary team based at the Museum is implementing the Management Plan. Levels of resourcing, including staff levels, are reviewed annually. There will be a five-year review of the management plan and systems, legal protection and research strategies, with annual monitoring and reporting. Particular emphasis is given to risk management and to improving visitation opportunities. The general public is kept informed of work undertaken through regular lectures, press, television and social media and direct participation.

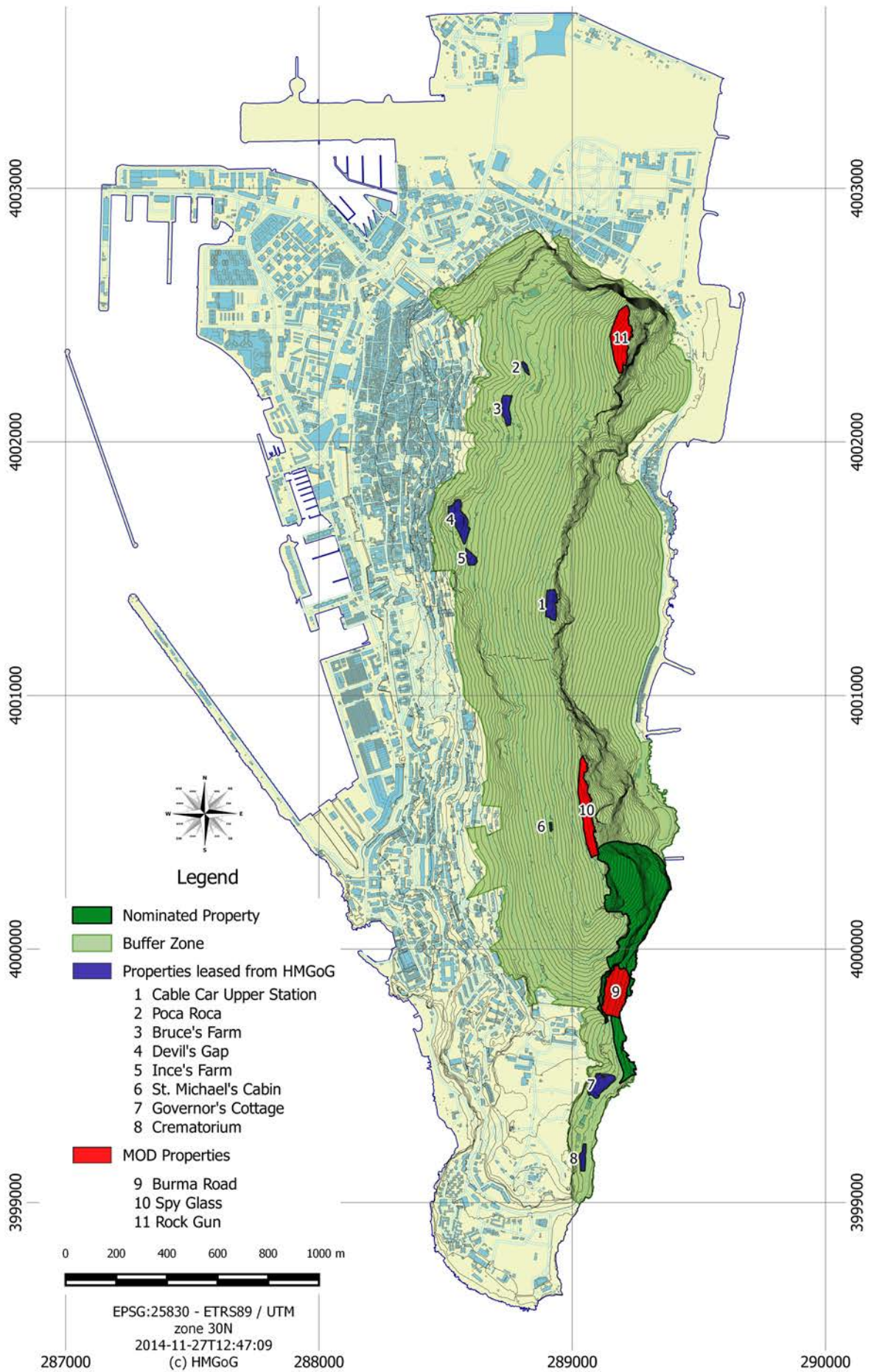


FIGURE 3.11 Land ownership within the Candidate World Heritage Site. The nominated property and nature reserve are owned by Her Majesty's Government of Gibraltar unless otherwise shown.

3.2. Comparative analysis

The candidate World Heritage Site is of Outstanding Universal Value because it contains exceptional, long and high-resolution sequences of archaeological and palaeontological evidence of the Neanderthals. These sequences importantly give us unique evidence of the cognitive capacities of the Neanderthals, including the first (and currently only) documented example of a rock engraving, the only known examples of exploitation of marine mammals and birds for food, and the only temporal sequence of exploitation of birds of prey and corvids for the use of their feathers in ornamentation. The site also records the first modern humans to reach the area. It thus offers a significant opportunity to study the life of the Neanderthals and of the modern humans who succeeded them. It is also special because it represents the survival of ecological functions and species that existed at the time of the Neanderthals. Overall, the site therefore offers exceptional evidence for the Neanderthals and their world.

The attributes demonstrating this are (see section 3.1.a for full description of attributes):

- (a) Four caves, and their contents, which were occupied by the Neanderthals for 100,000 years, including a late surviving population;
- (b) Gorham's Cave and three other caves within the site that provide evidence of the first modern humans in the area;
- (c) The 426-metre high Jurassic limestone cliffs within the site which provide a unique record of sea-level change, with evidence of fossil beaches at 5m AOD, and tectonic uplift with raised beaches, up to 210 m AOD, and screes;
- (d) Pollen and charcoal evidence and the well-preserved vegetation on Mediterranean Steps and adjacent cliffs on the site;
- (e) A uniquely-substantial proportion of the fauna that existed at the time of the Neanderthals which remains observable today; and
- (f) A well-preserved intertidal community of organisms on the rocky beach by Gorham's and Vanguard Caves.

3.2.a. Human Evolution sites currently on the World Heritage List

Seven of the eight human evolution sites currently on the World Heritage List - Lower Valley of Awash and Lower Valley of the Omo, Ethiopia; Fossil Hominid sites of South Africa; Olduvai Gorge (within Ngorongoro Site, Tanzania); Zhoukoudian, China; Atapuerca, Spain; and Sangiran, Indonesia – cover chronological periods which predate the Gibraltar site. These sites are not representative of the Neanderthals. The only World Heritage Site that currently makes reference to the Neanderthals is the Nahal Ma'arot Wadi el-Mughara Caves (Mount Carmel Site, Israel). For this reason the main comparisons will be made with this site. It should be noted that the Atapuerca site is chronologically complementary to Gibraltar, as is the Mount Carmel site. In both cases Gibraltar fills a more recent period of human evolution which is a vacuum on the World Heritage List. Significantly, Gibraltar offers an exceptional window into Neanderthal behaviour, including cognitive capacities, and ecology; in this regard there is no comparable site on the World Heritage List or outside it.

3.2.b. ICOMOS 1997 Study on potential fossil hominid sites for inscription on the World Heritage List

An ICOMOS study on potential fossil hominid sites for inscription on the World Heritage List (Gamble & Stringer, 1997), though focusing on hominid sites recognised that:

“To talk of Hominid sites is increasingly a misnomer. Instead we should think of groups of closely related sites and even landscapes. What is needed in the study of human evolution are good contexts which preserve good environmental and archaeological evidence as well as hominid fossils. This is needed in order to interpret their lifestyles and capabilities”.

This study broadly divided the periods of human evolution into four:

- A 5 million to 1 million years ago
- B 1 million to 300,000 years ago
- C 300,000 to 30,000 years ago
- D 150,000 to 10,000 years ago

Gibraltar was included in a provisional list among the sites considered at the time (well before many of the significant discoveries were made) to have potential for inscription. The Gibraltar sites fell under categories C and D which were defined as follows:

C *“300,000 to 30,000 years ago: for much of this period we see the regional evolution of Homo. The best known and largest sample comes from Europe and western Asia, where the Neanderthals form one of the best known fossil populations”.*

D *“150,000 - 10,000 years ago: As early as 150,000 years ago in eastern Africa we find fossil skulls of essentially modern type. Africa has now been identified both genetically and anatomically as the evolutionary centre for the appearance of people who looked, and eventually acted, like us. The most economical explanation of the evidence is that successive population movements out of Africa replaced the regional populations, such as the Neanderthals, in all parts of the inhabited Old World. One of the novelties associated with these modern people is their global colonization. It is in the last third of this period that people first colonized Australia, the Pacific islands, the northern parts of Asia, the American continents, and the Arctic. This great prehistoric colonization achieved primarily by people with a hunting and gathering lifestyle drew the demographic and geographical map for the later development of ethnic and regional populations of Homo sapiens”.*

Gamble & Stringer (1997) listed six criteria for selecting sites for inscription:

1. Sites with good chronologies
2. Sites with large numbers of fossils
3. Antiquity of the finds
4. Sites with potential for further finds
5. Groups of closely related sites and even landscapes
6. Sites with an historical and even iconic position in the discovery and demonstration of human evolution

The sites selected in Categories C and D are listed in Table 3.1. Eight sites, with the potential to inform on archaic-modern human transitions, were represented in categories C and D. Of these, only six had the potential to cover the Neanderthal-Modern Human transition: Mount Carmel, Dordogne, Gibraltar, Monte Circeo, Crimean and Croatian caves.

TABLE 3.1 Sites on the Gamble & Stringer (1997) ICOMOS Report listed under Categories C and D. Double asterisk (**) indicates a Neanderthal site.

Site	Gamble & Stringer (1997) Category		
	C	D	C+D
Koobi Fora and Turkana Basin (Kenya)	*	*	*
Mount Carmel (Israel)	**	*	**
Fossil Caves of the Dordogne (France)	**	*	**
Eastern Germany travertine sites (Germany)	**		
Solo River (Indonesia)	*		
Shanidar (Iraq)	**		
Gibraltar (United Kingdom)	**	*	**
Monte Circeo (Italy)	**	*	**
Crimean Caves (Ukraine)	**	*	**
Croatian Caves (Croatia)	**	*	**
Haua Fteah (Libya)	*	*	*
Zhoukoudian (China)		*	
Awash and Omo Basins (Ethiopia)		*	
Willandra Lakes (Australia)		*	
Dolni Vestonice-Pavlov (Czech Republic)		*	
Murray River Cemeteries (Australia)		*	
Klasies River Mouth (South Africa)		*	
Kostenki (Russian Federation)		*	
Vogelherd (Germany)		*	
Niah Caves (Malaysia)		*	
Border Cave (South Africa)		*	

TABLE 3.2 Sites on the Gamble & Stringer (1997) ICOMOS Report currently inscribed or on State Party Tentative Lists. Double asterisk (**) indicates a Neanderthal site.

Site	Gamble & Stringer (1997) Category				Year inscribed/first included on Tentative List
	A	B	C	D	
World Heritage List					
Lower Valley of Omo and Awash (Ethiopia)	*			*	1980
Willandra Lakes Region (Australia)				*	1981
Peking Man Site at Zhoukoudian (China)		*		*	1987
Lake Turkana National Parks (Kenya)	*		*	*	1997
Sites of Human Evolution at Mount Carmel: The Nahal Me'arot/Wadi el-Mughara Caves (Israel)			**	*	2012
Tentative Lists					
Pleistocene occupation sites of Klasies River, Border Cave Wonderwerk Cave, and comparable sites relating to the emergence of modern humans				*	1998
Gibraltar Neanderthal Caves and Environments			**	*	2011

Of the sites on the Gamble & Stringer (1997) that are inscribed or are on Tentative Lists (Table 3.2), only three are representative of Category C. Of these, only two – Mount Carmel and Gibraltar - are representative of the Neanderthals; the third site – Lake Turkana – is African and outside the geographical range of the Neanderthals. The same three sites are also the only ones with categories C and D represented and it follows that only Mount Carmel and Gibraltar cover the Neanderthal-Modern Human transition.

3.2.c. UNESCO Human Evolution: Adaptations, Dispersals and Social Developments (HEADS). World Heritage Thematic Programme

Recognising a significant mismatch between the long period covering the earliest stages of human evolution and its level of representation on the World Heritage List, the World Heritage Committee adopted Decision 32/COM/10A at its 32nd Session, held in Quebec City in July 2008 (WHC-08/32.COM/24Rev.). The Committee called for research to be carried out on the presence and potential of cultural representations linked to prehistoric archaeology to be initiated under the Global Strategy for a Representative, Balanced, and Credible World Heritage List. In August 2008

the World Heritage Centre commenced a study of prehistoric sites included in the World Heritage List and on Tentative Lists (Sanz & Keenan, 2011). The Thematic Programme was formally adopted by the World Heritage Committee in Sevilla in 2009 (WHC-09/33.COM/20; Decision 33/COM/5A) and the revision of the name to Human Evolution: Adaptations, Dispersals and Social Developments (HEADS) was approved by the World Heritage Committee in Brasilia in 2010 (WHC-10/34.COM/20; Decision 34/COM/5F.1).

A meeting of the HEADS Programme – Human Evolution and the World Heritage Convention - held in Burgos, Spain, in March 2009, made specific recommendations for human evolution site nominations (Sanz & Keenan, 2011). With regard to the “Neanderthal consortium”, as it was referred to at the meeting, fourteen sites were recommended as having potential for nomination (Table 3.3).

TABLE 3.3 Neanderthal consortium sites recommended by HEADS Programme as having potential for World Heritage nomination.

Site	State Party	Year inscribed/first included on Tentative List
La Chapelle-aux-Saints	France	
Le Moustier	France	
La Ferrassie	France	
El Sidrón	Spain	
El Castillo	Spain	
Zafarraya	Spain	
Gorham’s Cave, Gibraltar	United Kingdom	Tentative List 2011
Neander Valley	Germany	
Saccopastore	Italy	
Monte Circeo	Italy	
Krapina	Croatia	
Mount Carmel	Israel	Inscribed 2012
Amud	Israel	
Shanidar	Iraq	

Gibraltar Neanderthals

Of these fourteen sites, only Mount Carmel has been inscribed on the World Heritage List and only Gibraltar is on a State Party Tentative List.

3.2.d. Comparison of ICOMOS 1997 and HEADS 2009 studies

Table 3.4 lists the Neanderthal sites recommended in the Gamble and Stringer (1997) and the HEADS Burgos 2009 Meeting (Sanz & Keenan, 2011). The list of consistently recommended sites by different experts is significantly narrowed and, of these, only Gibraltar is currently on a Tentative List.

TABLE 3.4 Neanderthal sites recommended by ICOMOS (1997) and HEADS Programme (2009) as having potential for World Heritage nomination.

Site	State Party	Year inscribed/first included on Tentative List
La Chapelle-aux-Saints/Le Moustier/La Ferrassie (incorporated into Fossil Caves of the Dordogne in Gamble & Stringer, 1997)	France	
Gorham's Cave, Gibraltar (as Gibraltar in Gamble & Stringer 1997)	United Kingdom	Tentative List 2011
Monte Circeo	Italy	
Krapina (incorporated into Croatian Caves in Gamble & Stringer, 1997)	Croatia	
Mount Carmel	Israel	Inscribed 2012
Shanidar	Iraq	

3.2.e. Multi-level analyses

This part of the Comparative Analysis adopts a four-tier approach - in order of importance - based on a logical sequence derived from sub-sections (a) to (c). The Gibraltar site is compared with fourteen sites with a view to determining its relative importance among those sites with the potential or accepted as having Outstanding Universal Value (Table 3.5). We make the comparison highlighting the values which make the Gibraltar site unique and of Outstanding Universal Value. Only value 2 is not considered relevant to this nomination. The values are drawn from those suggested by ICOMOS 1997 and HEADS 2011 as worthy of being taken into account when considering new nominations (Table 3.6). The majority of sites in Table 3.5 are burial sites and are in contrast with the Gibraltar sites which reflect occupation. The analysis below focuses on the main strengths of the Gibraltar site (values 1, 3, 5 and 7 in Table 3.6) but it has to be noted that they also offer supporting material in respect of values 4, 6, 8 and 9. The Gibraltar site is probably unique in the research potential that its caves retain (value 4). In addition the site was significant in making an important contribution to the history of the study of human evolution (value 6). Although the focus in the comparative analysis is on chronology and palaeo-environmental potential, the caves in the site also offer huge potential for the study of settlement patterns and systems of resource exploitation (values 9 and 10).

TABLE 3.5 Sites selected for comparative analysis with the Gibraltar site.

Tier ¹	Rationale	Sites Compared	Number of Sites Compared
1	Sites representing Neanderthals and Neanderthal-modern human transition. These sites are recommended in the 1997 and 2009 studies and are inscribed or on Tentative Lists	Mount Carmel (Israel)	1
2	Sites representing Neanderthals and potentially the Neanderthal-modern human transition. These sites are recommended in the 1997 and 2009 studies but are not inscribed nor on Tentative Lists	La Chapelle-aux-Saints (France), Le Moustier (France), La Ferrassie (France), Monte Circeo (Italy), Krapina (Croatia)	5
3	Sites representing only Neanderthals. These sites are recommended in the 1997 and 2009 studies but are not inscribed nor on Tentative Lists	Shanidar (Iraq)	1
4	Sites representing Neanderthals only or Neanderthals and potentially the Neanderthal-modern human transition. These sites are recommended in either the 1997 or 2009 studies but are not inscribed nor on Tentative Lists	Crimean Caves (Ukraine), El Sidrón (Spain), El Castillo (Spain), Zafarraya (Spain), Neander Valley (Germany), Saccopastore (Italy), Amud (Israel)	7

¹In descending order of importance, explained under rationale

(a) Sites with good chronologies and from poorly represented periods (values 1 & 3 in Table 3.6)

The caves in the Gibraltar site cover the Late Pleistocene which is the critical period between 126,000 and 10,000 years ago (Subcommission on Quaternary Stratigraphy, http://quaternary.stratigraphy.org/definitions/pleistocene_subdivision/) that includes the extinction of the Neanderthals and the global expansion of modern humans. This important period in human history is currently not represented on the World Heritage List. Together, Gorham's and Vanguard Caves span the time range 127-13,000 years ago, practically the entire Late Pleistocene (Table 3.7). Significantly, Gorham's Cave includes a detailed sequence of the critical climatic period (MIS 3 between 57,000 and 29,000 years ago) that marked the Neanderthal extinction and the colonisation of Eurasia by modern humans. The Late Pleistocene chronological sequence of the Gibraltar caves is significantly longer than any of the sites listed in Table 3.5. Of the fourteen sites only Mount Carmel (Israel, Tier 1), Le Moustier (France, Tier 2) and El Castillo (Spain, Tier 4) have long chronologies. None has, however, chronologies that are comparable to the Gibraltar sites, either because they span a different time range (Mount Carmel) or because they are significantly shorter (Le Moustier, El Castillo).

TABLE 3.6 Values used in multi-level comparative analysis with the Gibraltar site.

Value ¹	Source
1. Sites with good chronologies	Gamble & Stringer, ICOMOS (1997)
2. Sites with large number of fossils	Gamble & Stringer, ICOMOS (1997)
3. Sites with finds from poorly represented periods	Gamble & Stringer, ICOMOS (1997)
4. Sites with potential for further discoveries	Gamble & Stringer, ICOMOS (1997)
5. Groups of closely-related sites or landscapes/cultural palaeo-landscapes	Gamble & Stringer, ICOMOS (1997)/Sanz & Keenan (2011)
6. Sites of historical/iconic importance in human evolution	Gamble & Stringer, ICOMOS (1997)
7. Deposits useful for reconstructing palaeo-environments	Sanz & Keenan, HEADS (2011)
8. Deposits containing human remains including intentional ones	Sanz & Keenan, HEADS (2011)
9. Vestiges of human settlements, in the open or in caves, whether temporary or long-lasting	Sanz & Keenan, HEADS (2011)
10. Settlements associated with systems of hunting, fishing or gathering	Sanz & Keenan, HEADS (2011)

¹Sanz and Keenan (2011) include six other criteria (e.g. food production, pottery) which are applicable only to Holocene sites

The chronology covered by the caves on the Mount Carmel World Heritage Site is largely Middle Pleistocene and reaches only into the early part of the Late Pleistocene (Table 3.7). Here, the modern human remains at es-Skhul are dated to between 135,000 and 100,000 years ago, suggesting that the burials took place within a relatively short space of time (Grun *et al.*, 2005). The long chronological sequence at Tabun, with Neanderthal presence, is predominantly Middle Pleistocene spanning the period 350-82,000 years ago (Mercier & Valladas, 2003; Coppa *et al.*, 2005). This means that this site represents human presence up to the last interglacial (Marine Isotope Stage, MIS, 5 http://www.lorraine-lisiecki.com/LR04_MISboundaries.txt) but not beyond.

TABLE 3.7 Representation of Late Pleistocene chronology and Marine Isotope Stages in Gibraltar caves, Mount Carmel, Le Moustier and El Castillo.

Marine Isotope Stage	Age Range (000 years ago)	Gorham	Vanguard	Tabun	es-Skhul	Le Moustier	El Castillo
5e	126-109	*	*	*	*		
5d	109-96	*	*	*	*		
5c	96-87	*	*	*			
5b	87-82	*	*	*			
5a	82-71	*	*			*	
4	71-57	*				*	*
3	57-29	*				*	*
2	29-10	*					

Le Moustier's and El Castillo's chronological sequences are informative about the latter part of the Late Pleistocene, including the Middle-Upper Palaeolithic transition in south-west France and northern Spain (Mellars, 1996; van Andel & Davies, 2004), but miss the early part altogether (Table 3.7).

In conclusion, the Gibraltar site offers a long and unique temporal sequence that covers the entire Late Pleistocene and it complements the Mount Carmel World Heritage Site: Mount Carmel covers the time range 350-82,000 years ago and Gibraltar the time range 127-13,000 years ago. Together, the two sites offer a unique chronology from the beginnings of the Neanderthals (Mount Carmel), the earliest contact with modern humans (Mount Carmel), through the period of the Neanderthal population decline and eventual extinction (Gibraltar) and the latest arrival of modern humans into Neanderthal territory (Gibraltar). The second part of the Neanderthal story is currently missing from the World Heritage List. The Gibraltar site would amply fill this gap.

(b) Groups of closely-related sites or landscapes/cultural palaeo-landscapes and deposits useful for reconstructing palaeo-environments (values 5 & 7 in Table 3.6)

Gibraltar Neanderthals The Gibraltar Caves offer a unique, high-resolution, window into the climatic conditions and the environment in which the Neanderthals lived and how they exploited these to full use (Barton, 2000; Finlayson, 2006; Finlayson *et al.*, 2006, 2008, 2011; Carrión *et al.*, 2008; Stringer *et al.*, 2008; Brown *et al.*, 2011; Ferguson *et al.*, 2011; López-García *et al.*, 2011; Barton *et al.*, 2012; Finlayson *et al.*, 2012; Blain *et al.*, 2013; Jiménez-Espejo *et al.*, 2013; Rodríguez-Vidal *et al.*, 2013; Shipton *et al.*, 2013). The conditions at Gibraltar have, additionally, become the baseline marker of Neanderthal behavioural ecology at regional and global level (Finlayson & Carrión, 2007; Finlayson, 2008, 2013; Finlayson *et al.*, 2011; Jennings *et al.*, 2011).

There is no site that, at present, can compare itself with the Gibraltar caves in terms of ecological richness combined with evidence of Neanderthal behavioural ecology, particularly over such a long time span. In addition, the relict environments that have persisted to the present day – most notably in the cliff vegetation and avifauna along with the fossil sand dune – offer a vision into the world of the Neanderthals that is unrivalled.

Some sites - Mount Carmel (Israel, Tier 1), Le Moustier and La Ferrassie (France, Tier 2), Monte Circeo (Italy, Tier 2), Krapina (Croatia, Tier 2), the Crimean Caves (Ukraine, Tier 4), and El Castillo and Zafarraya (Spain, Tier 4) – have some environmental evidence in connection with human occupation (Jelinek *et al.*, 1973; Mellars, 1996; van Andel & Davies, 2004; Barroso Ruiz & de Lumley, 2006). None, however, retain significant relict elements of the ecological conditions at the time when the sites were occupied, in large measure due to human action over millennia but also as a result of climate-driven ecological change from which the Gibraltar site has been largely buffered (Finlayson & Carrión, 2007).

The current record of 79 plant taxa, 42 molluscan taxa, 12 amphibian taxa, 20 reptile taxa, 150 bird taxa and 37 mammal taxa recorded in the cave sediments from the Late Pleistocene (Appendix 1) at the Gibraltar site means that the potential for reconstructing palaeo-environments, using comparative data from the same species which are living today, is much greater than for any of the other sites in Table 3.5. The avian species richness is unrivalled in the world (Table 3.8) and has been used, for the first time, to provide quantitative descriptions of Neanderthal habitat (Finlayson, 2006; Finlayson *et al.*, 2011).

TABLE 3.8 Late Pleistocene sites with highest avian diversity in the world and those from selected sites in Table 3.5

Site Name	State Party	Number of Taxa
(a) all Late Pleistocene sites*		
Gibraltar site ¹	United Kingdom	150
Arene Candide ²	Italy	132
Sandalja I & II ³	Croatia	106
Hayonim ⁴	Israel	105
Pin Hole Cave	United Kingdom	94
Oblazowa Cave	Poland	92
(b) sites in Table 3.5		
Gibraltar site ¹	United Kingdom	150
El Castillo	Spain	43
La Ferrassie	France	30
Zafarraya	Spain	16
Krapina	Croatia	10
Guattari (Monte Circeo)	Italy	4

¹ Composed of Gorham's Cave (n=141), Vanguard Cave (n=73), Ibex Cave (n=23), Sewell's Cave (n=12)

² included although the site is Epigravettian and has no Neanderthal levels

³ The site is Aurignacian, Gravettian, Mesolithic and has no Neanderthal levels

⁴ The site is largely Natufian and only one bird species is recorded from Mousterian levels

* These sites are not in the comparative analysis sites in Table 3.5 but are added as they are the Late Pleistocene sites with highest avian diversity (Tyrberg, 1998, 2008).

In order to complete the comparative analysis, Table 3.9 presents Neanderthal sites from across the geographical range based on the syntheses by Gamble (1999) and van Andel & Davies (2004). Only Gorham's Cave stands out as covering the entire Late Pleistocene. Vanguard Cave is among the few with a near-complete record and strengthens the completeness of the Gorham's Cave chronology. Vanguard Cave is still under study and the span of its chronology may be even broader than currently recognised.

TABLE 3.9 Comparative chronology of Late Pleistocene Neanderthal sites. Headings indicate Marine Isotope (MIS) Stages with date range (thousands of years) below.

Site	MIS 5e 123-109	MIS 5d 109-96	MIS 5c 96-87	MIS 5b 87-82	MIS 5a 82-71	MIS 4 71-57	MIS3 57-29
A du Mas Viel							*
A Moula							*
A. Rousseau							*
A. Sabourin							*
Abri des Canalettes					*		
Abri du Ranc del Arc							*
Abri Laborde					*		
Abri Pié-Lombard		*				*	
Abric Romani							*
Amud							*
Asprochaliko			*				*
Bacho Kiro							*
Bajondillo							*
Banyolas							*
Barbas III							*
Betovo							*
Brugas						*	
Budapest							*
Buran-Kaya III							*
Burgtonna		*	*				
Buzdujeni I Cave							*
Caldeirao							*
Canale delle Acque Alte							*
Cariguela							*
Caune de Belvis							*
Caverna delle Fate					*		*
Cioarei/Borosteni							*
Columbeira		*				*	*
Combe Grenal		*	*			*	*
Combe Sauniere							*
Conceicao							*
Cotencher							*
Cotender							*
Coudoulous II				*			*
Cova Beneito							*
Cova de Bolomor	*						
Cova Negra							*
Crvena Stijena							*
Cueva Millan							*

Site	MIS 5e 123-109	MIS 5d 109-96	MIS 5c 96-87	MIS 5b 87-82	MIS 5a 82-71	MIS 4 71-57	MIS3 57-29
Cueva Morin							*
Das Geissenklosterle						*	*
Denisova							*
Divje Babe							*
El Castillo				*		*	*
Erd							*
Ermitons							*
Figueira Brava							*
Fonseigner							*
Foz d'Enxarrique							*
Frechet Gr de Peyrere I							*
Furinha					*		
Gabasa I							*
Gorham's	*	*	*	*	*	*	*
Gr aux Ours							*
Gr de La Baume							*
Grotta Breuil							*
Grotta de Castelcivita							*
Grotta dei Giganti							*
Grotta del Broion							*
Grotta del Cavallo							*
Grotta del Principe					*		
Grotta di Gosto							*
Grotta Guattari					*	*	*
Grotta La Cala							*
Grotta Moscerini		*	*		*		
Grotte d'Echenoz-la-Meline							*
Grotte de Peletang							*
Grotte du Renne							*
Grotte Neron							*
Grotte St Marcel							*
Grotte Tournal							*
Grotte Vaufray	*			*	*		
Gruta do Escoural							*
Hyaena Den							*
Ibex							*
Il'skaya							*
Ioton							*
Jarama VI							*
Kabazi II							*
Kebara						*	
Konigsau							*
Korolevo II							*
Krapina							*
Kulna							*
Kurtzia							*
L'Arbreda							*
La Chaise	*	*	*	*		*	
La Chapelle							*
La Ferrassie							*

Section 3 - Justification for inscription

Site	MIS 5e 123-109	MIS 5d 109-96	MIS 5c 96-87	MIS 5b 87-82	MIS 5a 82-71	MIS 4 71-57	MIS3 57-29
La Quina							*
La Roche Gotard							*
Labeko Koba							*
Le Moustier					*	*	*
Le Trou du Renard							*
Les Cottés							*
Les Rivaux							*
Mezmaiskaya							*
Molodova V							*
Montagne de Girault							*
Ohaba Ponor							*
Oliveira							*
Pech de l'Azé II			*	*	*	*	*
Peña Miel I							*
Reclau Viver							*
Regourdou							*
Ripiceni-Izvor							*
Roc de Combe							*
Roca del Bous							*
Roche a Pierrot							*
Roquette II							*
Salemas							*
Salzgitter-Lebenstedt							*
Samuilitsa							*
Sant' Agostino							*
Sclayn Cave							*
Seclin				*			
Sesselfelsgrotte							*
Shanidar							*
Smolucka Pecina							*
St Césaire							*
Starosel'e							*
Tabun	*	*	*	*			
Tata			*				*
Taubach		*					
Temnata			*			*	
Tokod							*
Trou Al'Wesse							*
Valina							*
Vanguard	*	*	*	*	*		
Veternica							*
Vilas Ruivas							*
Vilas Ruivas						*	*
Weimar	*	*					
Zafarraya							*
Zaskal'naya VI							*
Zobiste			*	*			
Zuttiyeh			*	*			

The nominated property's Outstanding Universal Value is confirmed by a combined series of attributes which cannot be found together in such a coherent manner anywhere else in the world. There is no site in the world, as shown in this analysis, which has the quality and diversity of attributes present in the Gibraltar site.

In chronological terms, the Gibraltar candidate World Heritage Site complements the Mount Carmel World Heritage Site, the only site currently on the World Heritage List that represents the Neanderthals. Mount Carmel records the first contact between Neanderthals and modern humans between 130 and 100,000 years ago whereas Gibraltar marks the end of the process 100,000 years later. Additionally, and most importantly, Gibraltar offers us a detailed record of how Neanderthals lived and survived and a clear vision into their world. Gibraltar is therefore crucial to our understanding of the Neanderthals and the world in which they lived.

The nominated property is therefore a rare example of millennial preservation in spite of major tectonic and climatic upheavals, and human activity. Its very nature is defined by change: the very shape and scale, its caves, the changing interface between land and sea and the constant species turnover at one of the world's renowned migratory cross roads. Extinction has been an integral part of this dynamic, continuously changing, world. The Neanderthals who lived here for over 100,000 years are now extinct. Colonisation also has its part as testified by the arrival of modern humans once the Neanderthals had left. Yet, even after millennia of change, the site's resilience is such that not only are we able to retrieve information about these early humans today, but we are also able to experience significant portions of that ancient world in situ. Nowhere else in the world are we able to do this.

3.3. Proposed statement of Outstanding Universal Value

a) Brief Synthesis

The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and 46 caves on the east side of the Rock of Gibraltar bordering the Mediterranean Sea. Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea-level rise and fall, some caves now being partly-submerged and others offshore lying in the sea bed. Exceptionally, given the abrupt relief, some caves – most notably Gorham's and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years. Four caves have archaeological evidence of Neanderthal occupation and four of the first modern humans. They have generated a large body of information on the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique examples of the exploitation of birds and marine mammals for food. Gorham's and Vanguard Caves have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. The caves have been excavated systematically over 25 years but vast deposits remain intact, retaining huge potential.

Lush Mediterranean vegetation and intertidal animals - species known to have predominated at the time of the Neanderthals - continue to cover the cliffs, slopes and rocky beaches. Resident birds, present when the Neanderthals lived here, still breed within the site while many migratory species rest or fly over the site during their annual migrations between Europe and Africa. Put together, all these elements offer the most complete picture of the Neanderthal world anywhere. Importantly, there are significant components surviving to the present which provide a unique opportunity to study and interpret the Neanderthal way of life in a natural context. The subsequent presence of early modern humans offers an excellent opportunity to compare the lifestyles of two human lineages within the same eco-geographical context, a comparison that is revealing great similarities between the two lineages and that is changing our view of the abilities of the Neanderthals. This extraordinary combination provides an exceptional and vivid picture of the Neanderthals, their way of life and environment, and gives the property its Outstanding Universal Value.

b) Justification for Criteria

Criterion (iii): The site provides an exceptional testimony to the Neanderthals, a people and their cultural traditions, who are now extinct. Rock engravings, stone tools, hearths, bones with cut marks and evidence of burning, and molluscs showing fracture marks made with stone tools are the primary evidence of the Neanderthals. A rich array of fossil vertebrates (including the highest avian species diversity of any site), molluscs, pollen and charcoal provide the climatic and ecological context for Neanderthal and subsequent early modern human occupation. The enormous depth of archaeological and palaeontological deposits in Gorham's and Vanguard Caves spans 125,000 years. An outstanding high-resolution record thus allows comparisons across a huge time span and permits analysis of stasis and change in cultural traditions. The quality of resolution allows understanding of the daily activities of the Neanderthals, including their capacities for abstract thinking. The spatial distribution of sites permits a detailed understanding of how the Neanderthals exploited their territory. The present environments of the site contain plants and bird species which shed light on this lifestyle. Our knowledge of the abilities and cultural traditions of the Neanderthals has changed decisively as a direct consequence of the evidence provided by this incomparable site.

Criterion (v): The site is of Outstanding Universal Value because its topography, geological features, natural cliff vegetation and rocky shoreline communities, afford a clear vision of a place which was once home to the Neanderthals. Nowhere is the relationship of the Neanderthals and their environment more palpable than it is in this site. It offers important features that allow us to understand and interpret the traditional lifestyle of the Neanderthals in their environment, and also to compare it to that of early modern humans. Part of this landscape was subjected to irreversible change with sea level rise 10,000 years ago; ancient raised beaches, scree slopes, shorelines and dunes within the site are reminders of the dynamic and precarious nature of a coastal world that was in a constant state of flux. The evidence in the caves enables us to understand how Neanderthals and modern humans adapted to these changes, varying their subsistence strategies as opportunities arose. The incomparable topography of the Rock of Gibraltar, as well as its modern-day flora and fauna, with many species still present from ancient times, opens up an exclusive window into the lost world of the Neanderthals.

c) Statement of Integrity

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The boundaries follow natural topographical features that incorporate the complete series of attributes that gives the site Outstanding Universal Value. The geological and archaeological attributes are exceptionally well-preserved while a significant proportion of the flora and fauna present in the Palaeolithic is still present today. In addition to their intactness, the attributes have a clear coherence within the boundaries of the property. The inclusion of a significant area surrounding the caves makes it possible to understand more fully the ways in which the Neanderthals interacted with their surroundings; it also guarantees that the nominated property is of adequate size to ensure the complete representation of the features and processes that convey its significance. Risks affecting the property are largely related to long-term climate change and sea level rise; shorter term risks with natural fires and rock falls; they are considered to be low and are closely monitored. The attributes are not threatened by development, deterioration or neglect. A combination of legal protection, active management, vertical scale and topography minimises risk to the property, which can only be appreciated if its dynamic character is fully understood.

d) Statement of Authenticity

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning. These attributes fall into three distinct categories: 1) the stratified deposits within the caves which contain a wealth of information that situates the site in a time framework are wholly authentic in material and substance. They contain engravings, artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first modern humans. 2) the form and substance of the caves themselves, their location and setting, the surrounding cliffs, their geological formations and the tangible evidence of climate and sea-level change (ancient beach levels); and 3) well-preserved relict cliff vegetation and faunal elements that have a direct connection with the vegetation that grew on these cliffs when Neanderthals and modern humans lived in the caves.

e) Requirements for Protection and Management

Ownership of the site rests with Her Majesty's Government of Gibraltar which has appointed the Gibraltar Museum, through its Director, as manager. A small section of the site is owned by the UK Ministry of Defence. All the key attributes of OUV are entirely situated within HMGoG-owned (non-leased out) land. The site has full legal protection as part of the Gibraltar Nature Reserve; individual caves are also Schedule 1 Category A (maximum protection) sites under the Gibraltar Heritage Trust Act. Additional protection is provided by the Town Planning Act. Access to fragile caves is strictly controlled, permitted only with a guide approved by the Gibraltar Museum Director. The Mediterranean Steps are open to the public and are maintained with interpretation; the relict vegetation along the cliff walk is not threatened. Wildlife is protected through the Gibraltar Nature Reserve Act. Visitor numbers to sensitive parts of the site are and will be restricted and closely-monitored. Systems of access control will be updated as technology improves. Archaeological excavations are managed to ensure no loss of site integrity. An international committee of experts reviews relevant plans from the perspective of conservation, maintenance of site integrity and academic standards.

A Steering Committee is guiding the process of nomination; this Committee will become an Advisory Forum if the property is inscribed. Non-governmental organisations (Gibraltar Ornithological and Natural History Society; Gibraltar Heritage Trust) with site interests are directly involved in management processes. A dedicated multi-disciplinary team based at the Museum is implementing the Management Plan. Levels of resourcing, including staff levels, are reviewed annually. There will be a five-year review of the management plan and systems, legal protection and research strategies, with annual monitoring and reporting. Particular emphasis is given to risk management and to improving visitation opportunities. The general public is kept informed of work undertaken through regular lectures, press, television and social media and direct participation.

4. State of conservation and factors affecting the property

4.a Present state of conservation

The state of conservation is described in the following order: the nominated property itself (4.a.1) and the buffer zone (4.a.2). The state of the nominated property is excellent. Minor environmental and aesthetic improvements, which would have been carried out irrespective of the nomination, are under way as parts of a continuing effort to improve further the quality of the site.

4.a.1 State of conservation: the nominated world heritage property

The general state of conservation of the property is excellent. Specifically, the property's attributes, which give it its Outstanding Universal Value, are in excellent condition and maintain a natural coherence. The caves, a major component, are well-preserved and the main archaeological and palaeontological ones retain vast deposits that constitute a reservoir of information for present and future generations of scientists. The scale of the deposits is such that little impact is noticeable from the last 25 years of excavation. Even so, monitoring of deposits as part of the research and conservation strategy will ensure that the state of conservation of the caves is maintained. The cliffs are in pristine condition and covered in rich growths of lichen which are indicators of clean air. The lush natural vegetation on these cliffs, which can be experienced at first hand in the Mediterranean Steps, is an excellent indicator of the environmental health of the property. Despite the high density of population in Gibraltar, the remoteness of the vertical cliffs has guaranteed their long-term survival, which is now enhanced by legal protection. This isolation has also allowed species of birds to live here, either to nest, roost or to refuel on migration.

The condition of individual heritage assets is therefore very good with those relevant to the site's Outstanding Universal Value being excellent. These include the caves with Middle Palaeolithic occupation at sea level.

Archaeological deposits are in very good condition, but the fragile remains need continuing protection by restricting access. Until now, excavations have been permitted by the Minister for Heritage under the provisions of the Gibraltar Heritage Trust Act 1989. Excavations have followed a research strategy based on specific questions being asked of the site. It is thanks to the past 25 years of research that our state of knowledge is such that the site's exceptional importance is recognised. The Gibraltar Museum has a statutory advisory role under this Act and maintains a close vigilance on the state of conservation of the site and the impact of excavations. Archaeological excavations are carried out within peer-reviewed, clearly defined, research frameworks. Land access to some of the most sensitive caves is already restricted by the Gibraltar Museum to 20 people escorted at any one time and only with permission from the Director of the Gibraltar Museum. Such access is controlled by the Ministry of Defence who operate a gate which leads to various locations including the caves. A second gate, controlled by the Gibraltar Museum, then

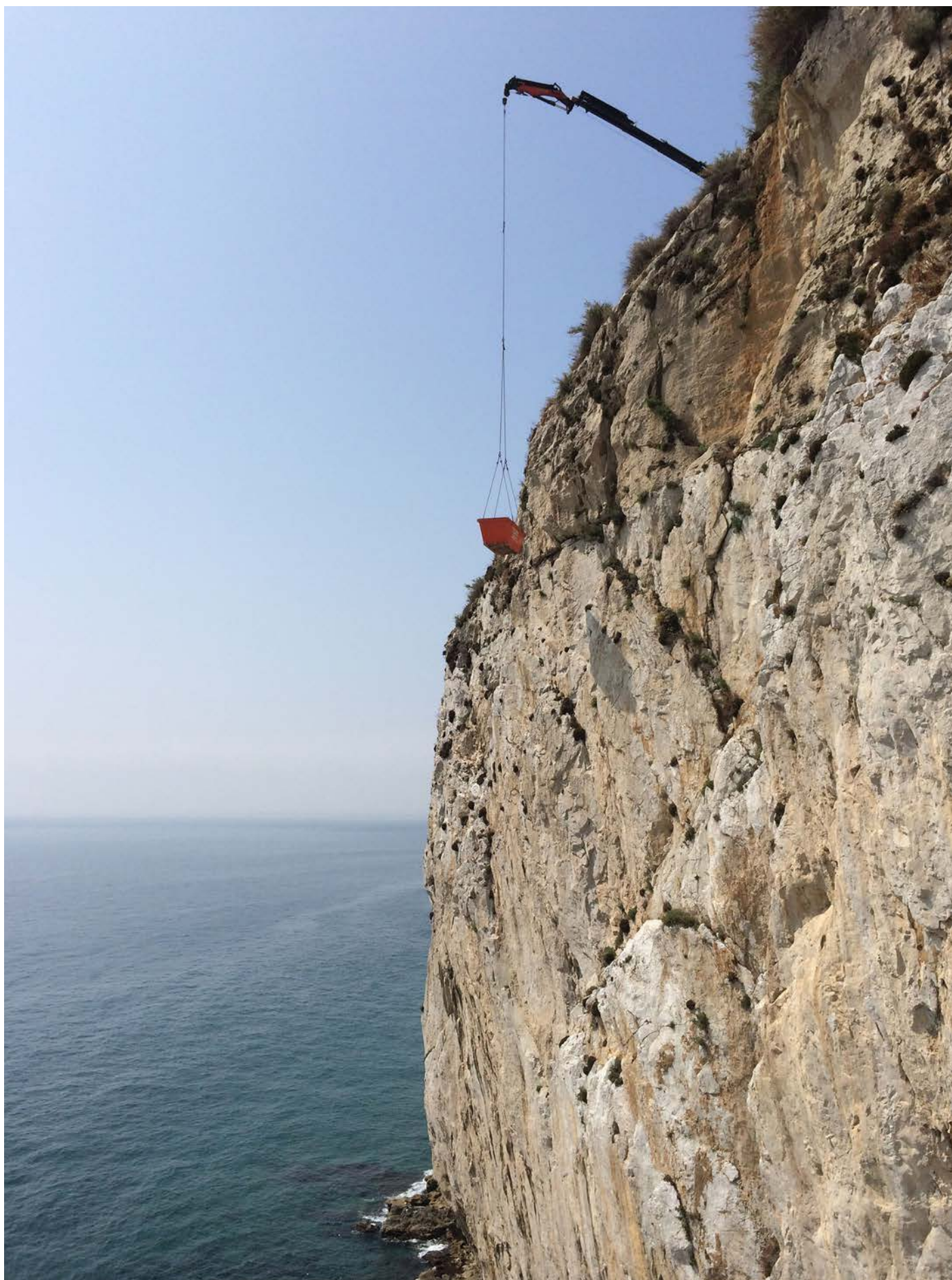


FIGURE 4.1 Debris washed ashore by storms over the years at the beach in front of Gorham's and Vanguard Caves was lifted away by crane in July 2014.

provides exclusive access to the caves themselves. There is therefore a double security access filter in place. This system of controlled access will continue. Some caves that are potentially accessible have been protected by gates and monitoring of others by the Gibraltar Museum's Caving Unit is on-going. There are some relatively minor problems in a few caves (particularly Goat's Hair Twin Caves) with graffiti but there is a programme in place to remove these. In no instance are the attributes of Outstanding Universal Value compromised or at risk. Some of the historic graffiti will be left, as they form an important part of the site's history and are of significant local interest. There is also a regular programme of routine cleaning and litter removal. All historical accumulations of debris washed ashore were removed in July 2014 (Figure 4.1).

Several elements within the property, none of them critical attributes of Outstanding Universal Value, require attention and are being addressed. Safety considerations require the renovation of the steps leading down to Gorham's and Vanguard Caves, but this work will be low key and in keeping with the existing design. It is programmed for completion in the spring of 2015. The Second World War Monkey's Cave Convalescent Hospital, above Gorham's Cave, is in an unusable condition. In relation to the site's Outstanding Universal Value the hospital is of very low significance. Its façade will be repaired and painted by March 2015 but the building will remain out-of-bounds. Routine cliff stabilisation maintenance (such as replacement of netting) will be carried out as needed, forming part of a regular programme of assessment. One small area of cliff above Gorham's Cave requires the addition of a 2-m high rock-fall safety fence along the cliff top and the work is scheduled for January 2015 with completion in February 2015. The opportunity will be taken to replace old protective netting. The fence will be screened by allowing the re-growth of native vegetation. Heritage Impact Assessments are routinely carried out before works are executed and all works go through the Development and Planning Commission.

The condition of the Mediterranean Steps and the high cliffs is excellent. Routine maintenance of paths, steps and safety features is carried out. There is an on-going maintenance programme undertaken by the Ministry of the Environment in consultation with the Gibraltar Ornithological and Natural History Society. Baseline data on plant species, birds, mammals and reptiles are kept and monitored by the Gibraltar Ornithological and Natural History Society, through Wildlife Gibraltar Ltd.

The marine setting is very good and protected by designation as a Special Area of Conservation (Southern Waters of Gibraltar SAC). The best way to appreciate the whole site is from the sea or from the Europa Advance Batteries and this is taken into account in the visitation strategy. Viewed from these points, the site and its evolutionary history is perfectly clear as it retains its natural coherence within which the various attributes are seen to be interlinked and their interrelationship is clearly visible. There is a programme of regular clearance of litter on some sea cliffs in place.

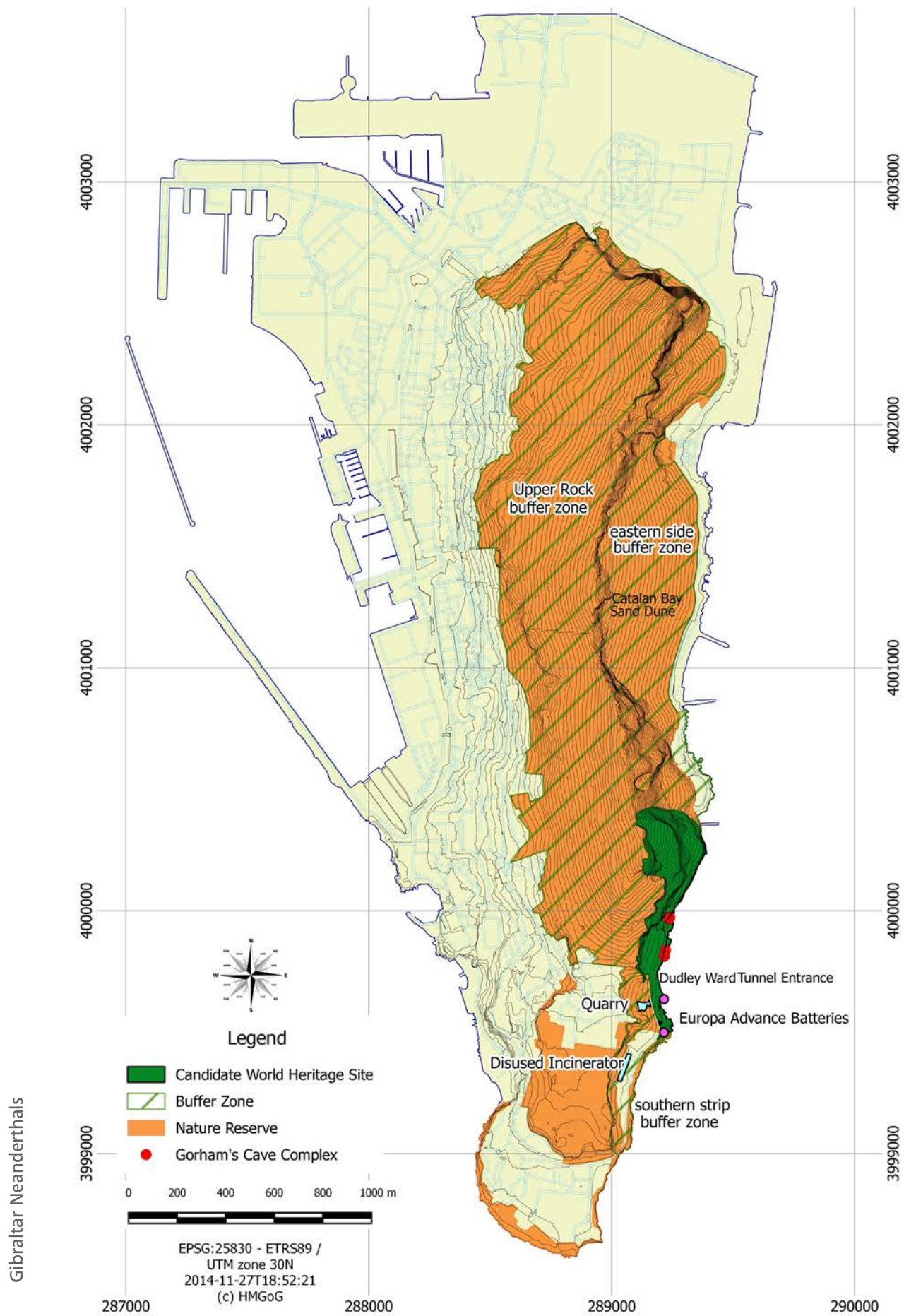
4.a.2 State of conservation of the nominated property's buffer zone

The aim of the buffer zone is the protection from external impact on the attributes within the property. It will achieve this as a strictly controlled zone which permits the continued protection of vegetation and fauna, acting as a reservoir of species to the property. The buffer zone also acts as a reservoir of potential archaeological assets.

Most of the buffer zone is free from development pressure – as part of the Gibraltar Nature Reserve – thus protecting the property's setting. The few areas of buffer zone outside the reserve are regulated by Town Planning procedures. As such, the buffer zone today fully protects these attributes of Outstanding Universal Value. Nevertheless, work is in hand to beautify the approaches to the site through landscaping and the removal of unused buildings and structures. The part of the buffer zone on the western side of the Upper Rock (west of the ridgeline marking the top of the nominated property) is entirely within the designated Gibraltar Nature Reserve and its overall condition is very good. The nature reserve is protected by legislation and by the Gibraltar Development Plan; access is controlled and restricted between sunset and sunrise. This part of the reserve (the Upper Rock) contains several natural and heritage visitor attractions and carries the majority of visitor traffic. There are daily programmes of cleaning and routine maintenance which cater for littering caused by some visitors to the area. Visitor facilities are also in the process of being upgraded with a £3 million programme of improvements to access having been announced in July 2014.

The Gibraltar Nature Reserve has evolved and developed significantly since the original Nature Reserve was designated in 1993 and was exclusively contained within the extent of the Upper Rock. As part of the continued effort to protect biodiversity and natural habitats in Gibraltar, the Upper Rock Nature Reserve was extended in 2013 to include new areas that will help protect unique and distinctive habitats and species found in Gibraltar. Legal protection is provided by means of the Nature Conservation (Designation of Gibraltar Nature Reserve) Order 2013 and the Nature Protection Act 1991. The Gibraltar Nature Reserve now encompasses distinct habitats all of which support both endemic and more common flora and fauna. In order to ensure the proper management of the reserve, a new management plan is being published in 2015 by the Department of the Environment which builds on the existing plans namely the Upper Rock Nature Reserve: A Management and Action plan produced by Perez & Bensusan (2005) and the Gibraltar Biodiversity Action Plan: Planning for Nature (Perez, 2007). The revised plan, which will cross refer with the nominated World Heritage Site Management Plan, sees the creation of a wider management body composed of the Ministry for the Environment, Ministry for Tourism, Ministry for Heritage, Nature Conservancy Council, Department of the Environment, Gibraltar Tourist Board, Gibraltar Ornithological and Natural History Society, Gibraltar Museum, Gibraltar Heritage Trust and the Ministry of Defence as well as a number of *ad hoc* stakeholders. This structure will complement the management structure for the nominated property.

There is nothing in the southern strip of the buffer zone (Figure 4.2), south of the Gorham's Cave Complex, which has a direct impact, other than visual, on the site and action is in hand to beautify this area. A disused waste incinerator facility is located within this zone and its high chimney, in particular, is an eyesore which detracts from certain views of the site. The dismantling of this incinerator commenced in July 2014 and a long-standing eyesore is being removed (Figure 4.3). Other visual intrusions are relatively minor in comparison.



Gibraltar Neanderthals

FIGURE 4.2 Map of buffer zone sectors and location of individual features mentioned in 4.a.2.

The Europa Advance Batteries will become viewing platforms overlooking the main caves and will provide visitors with spectacular views and interpretation. To achieve these viewing platforms, and incorporate their historical value, portacabins and other structures currently on the batteries will be removed. The viewing platforms will be integrated into the programme of Gibraltar Nature Reserve walkways currently in advanced stage of execution. A programme of works will ensure regular maintenance.

An adjacent abandoned quarry is currently used to store refuse. This facility has no visual or other impact on the nominated property. Netting and screening has been placed, as an interim measure, to contain the refuse. With the rationalising of facilities in this area, related to the removal of the incinerator, it is expected that this deposit will be closed down during 2016 and the quarry used for parking coaches and other vehicles for visitors to the viewing platforms. Historical accumulations of litter on some cliff taluses are in the process of removal.

Vegetation landscaping using native species is seen as the key to improving the quality of the buffer zone as well as an opportunity to recreate habitats that existed on the Rock at the time of the Neanderthals. A programme of planting will commence early in 2015 and will be on-going. It will focus on the removal of invasive species and the planting of natural vegetation, including stone pines and junipers, which are known to have grown naturally since the time of the Neanderthals. A start with the removal of invasive species was made by volunteers from the community during the Clean up the World Day in September 2014.



FIGURE Removal of disused incinerator in July 2014.
4.3

The buffer zone along the east coast comprises the Catalan Bay Sand Dune, the cliffs above the dune as well as talus slopes within the Gibraltar Nature Reserve at its north-eastern corner. The state of conservation is very good and the strict guidelines of the Gibraltar Nature Reserve apply. Tamarisks have recently been planted to line the northern entrance to the Dudley Ward Tunnel. Further planting of native vegetation will screen the entrance, particularly as the trees grow in stature. There is remnant machinery on a small area of the slopes of the Catalan Bay Sand Dune, that has no impact on the attributes of the property, but a programme of removal is nonetheless in the management plan for the buffer zone.

4.a.3 Summary of present state of conservation, issues and solutions

The overall condition of the property is excellent and this is particularly noteworthy given its proximity to a high population density zone and the long military history of the Rock of Gibraltar. A series of actions was being undertaken in the buffer zone irrespective of nomination as part of a drive to improve the quality of the experience of people visiting the area and supporting the emphasis which Gibraltar is placing on its heritage and environment. Thus, a major programme of improvements to areas of the Gibraltar Nature Reserve is part of a process that was happening independently of nomination. With the run up to nomination, these projects are being done in co-ordination with the World Heritage project. The measures currently in hand are aimed at further improvement through landscaping and removal of some disused buildings which are in the buffer zone.

4.b Factors affecting the property

(i) Development Pressures (e.g., encroachment, adaptation, agriculture, mining)

Within the nominated World Heritage property

There are no pressures for re-building or new construction within the property boundaries. There are no pressures from adaptation of existing buildings for new uses which would affect the Outstanding Universal Value, authenticity or integrity of the site.

There is no public access to the Gorham's Cave Complex sea caves by land. Access is through Ministry of Defence and Her Majesty's Government of Gibraltar (HMGoG) land and is restricted to a maximum of 20 people at any one time, and requires the permission of the Director of the Gibraltar Museum. There are no pressures from tourism-related development.

Unauthorised access by boat is monitored by security guards who immediately notify the Royal Gibraltar Police Marine Section. Direct monitoring takes place from the Europa Advance Batteries and will be replaced by the location of CCTV cameras at the Europa Advance Batteries and on the steps leading down to the caves. These cameras will be monitored 24 hours by security guards with a quick response should any landings be attempted. In addition, a security gate will be placed inside Gorham's Cave early in 2015 to protect the sensitive back area which has the rock engraving and cave art.

The Mediterranean Steps and Upper Rock are accessible by foot and are well-used by local people and by visitors to Gibraltar. Tourism management is light and low-key: the area is maintained with interpretation panels, and there are routine safety checks and maintenance works. The vegetation along the cliff walk is not threatened. Non-governmental organisations – Gibraltar Ornithological and Natural History Society and Gibraltar Heritage Trust, which have interests in the site – are directly involved in the management and consultation process. Public awareness-raising and education are considered essential tools in minimizing encroachment pressure. The general public is kept informed of work undertaken, including progress of annual excavations. In addition, stakeholders form part of a Steering Committee during the process of nomination of the site for World Heritage Status. Their role will be extended post-nomination within the World Heritage Advisory Forum (Section 5.e.2).

Archaeological excavations, though naturally removing sediments, are hugely significant in enhancing knowledge and interpretation. The excavations are carefully managed and carried out with specific research questions within an agreed research strategy to ensure there is no loss of site integrity. Excavations will be subject to a licence from the Minister for Heritage under the Heritage Trust Act and will be supervised and monitored by the Gibraltar Museum. An International Research and Conservation Committee will assess annual excavation plans, taking particular note to the expected volume of sediment to be excavated in relation to potential impact on the sites potential for future research and conservation. As from December 2014, the Gibraltar Museum will have a dedicated small team undertaking small-scale excavation and conservation of the deposits. Given the benign climate and the proximity of the caves to the Gibraltar Museum, such work will be undertaken year-round. The advantage is that fewer people will impact on the site than the numbers during an annual excavation. This approach is seen as balancing in the best possible way the retrieval of evidence that, in time, would be lost through natural erosion with the conservation of deposits. It will also allow the pace of excavation to be determined by the nature of the finds in the cave itself, under no pressure to have to complete excavation by a specific deadline. From 2015 the larger-scale annual excavations will only take place when a need has been identified to answer research questions that the small-scale approach cannot answer.

The Buffer Zone

Most of the buffer zone is part of the Gibraltar Nature Reserve and is subject to its strict protective measures. There will, from time to time, be a need to maintain or replace existing infrastructure in the Gibraltar Nature Reserve. This infrastructure is mainly of historical military origin and cannot realistically be moved or buried; it is part of the heritage of the Rock. Any maintenance or replacement will, however, take account of the importance of the site and will be carefully monitored by the World Heritage Team. Potential development pressure within the buffer zone is restricted to the east side along Sir Herbert Miles Road, though there is limited scope for development due to space and the risk of rock falls from the cliffs above. This area currently falls within Zone 4 of the 2009 Gibraltar Development Plan (Figure 4.4) and general standards including environmental improvement and protection of natural and cultural heritage assets apply. Within the buffer zone at the southern end, the existing waste incinerator on Europa Advance Road (Figure 4.3) is being dismantled, improving vastly the condition of that sector of the buffer zone. The Catalan Bay Sand Dune has historically been used as both catchments for water collection and, to a small extent, as a source of building material. There are no threats, however, as the land is now included in the Gibraltar Nature Reserve and is protected by legislation. A small strip of sand dune which is not part of the Gibraltar Nature Reserve is in the process of inclusion. The dune is potentially accessible from certain points but its form and the steepness of slope mean that there are no threats of unmanaged visitors and the main access points are controlled by locked gates. Routine surveys and maintenance are undertaken to ensure stability.

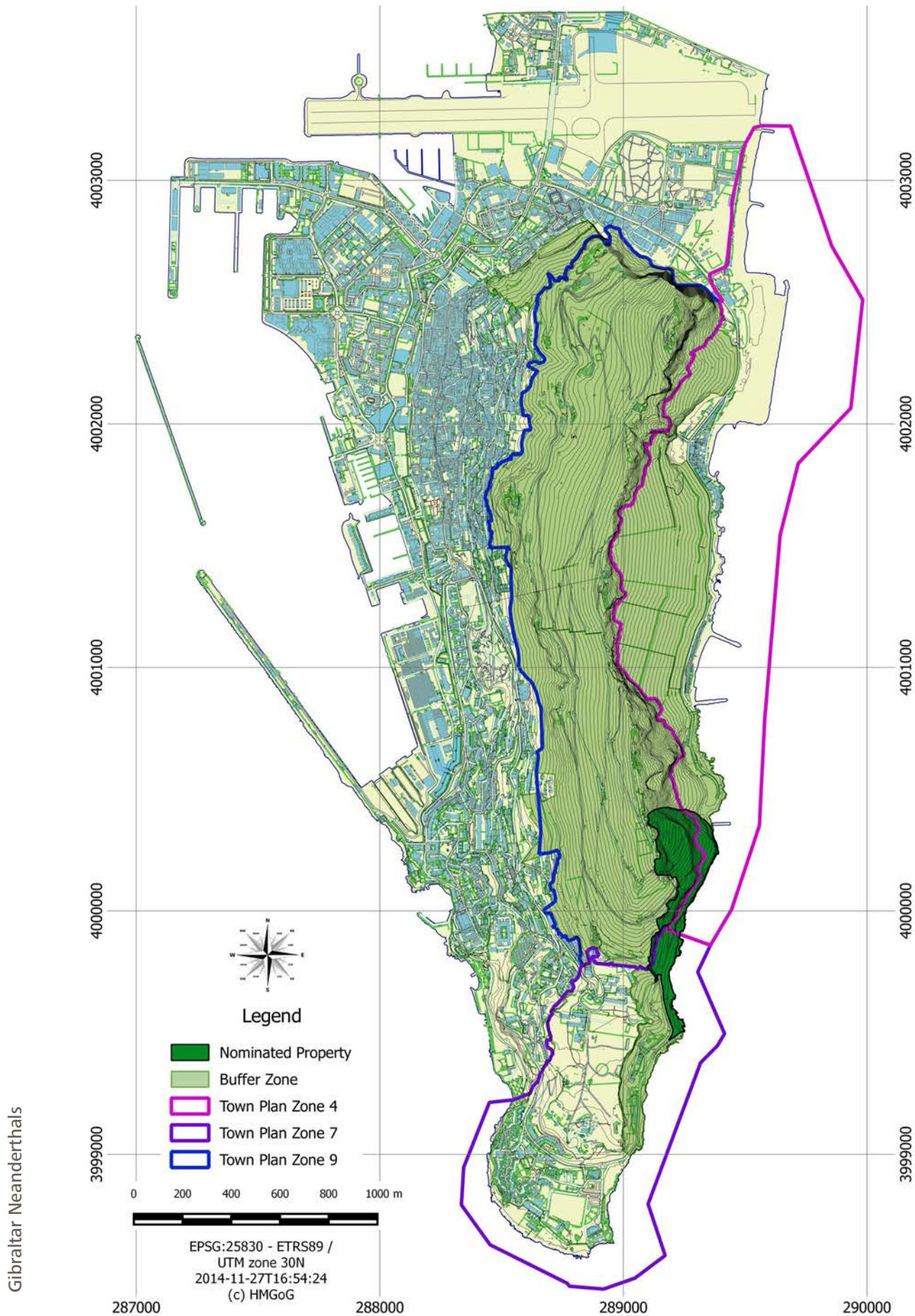


FIGURE 4.4 2009 Gibraltar Development Plan Zones in relation to the nominated property and buffer zone.

(ii) Environmental pressures (e.g. pollution, climate change, desertification)

The potential sources of environmental deterioration are climate change, sea level rise and pollution from ships. Climate change and sea-level change have been features of the history of the area which lead to its Outstanding Universal Value but they are not likely to have an impact on the vegetation or wildlife in the foreseeable future. The principal risk from sea level rise is to the sea caves with Middle Palaeolithic occupation deposits. This is not considered an immediate concern, but risk of erosion is a medium-term pressure and protection by some form of marine structure will be investigated as part of the management plan implementation. Any measure will be referred to the World Heritage Advisory Forum, the development and Planning Commission and will take due regard of the requirements of the World Heritage Site and the marine Special Area of Conservation (SAC).

(iii) Natural disasters and risk preparedness (earthquakes, floods, fires, etc.)

Potential threats to the property are rock falls, cliff erosion, sea incursion, fire and drought. There is also some potential for erosion of the sand dune by severe rainfall. These are currently considered to be low risk and risk preparedness plans are in place to cover all these aspects (section 7.b). There is a regular programme of risk assessment on the stability of the Rock and its cliffs, contingency plans for fire and accidents, floods and other disasters. At present there is no pollution from vessels off the coasts of Gibraltar. Potentially, pollution – such as oil pollution - from ships passing by or anchored off the east coast could have a very detrimental effect on the marine environment. The marine setting is protected as a Special Area of Conservation. The present assessment of risk is very low, and there is a programme of monitoring and reporting of all incidents through the Captain of the Port. Results are published annually in the Government’s Abstracts of Statistics. Risk preparedness plans are in place to cover these aspects (section 7.b).

(iv) Responsible visitation at World Heritage sites

Current Position: Visitors to Gibraltar

The total population of Gibraltar is 32,734 (2013 statistics). The total annual visitor footfall in Gibraltar since 2010 exceeds 11 million (Table 4.1), arriving by land (car, coach, foot, parties and individuals), by sea on cruise liners (278,179 in 2013) and by air at the international airport (193,368 in 2013). The visitors are attracted by a wide array of heritage sites, natural assets (particularly the Barbary Macaques), shops and other amenities. A very high proportion of visits are day trips (estimated at 86% of visits). In total there are between 2.5 and 2.9m vehicle trips (figures from 2009 to 2013; Tourist Board reports, HMGoG website) which include over 8000 coach visits from Spain. Of the visitors by coach, 28% are British, 24% are Spanish and 36% are other European Union nationals. Of excursionists arriving at the land frontier by car or on foot, 86% are Spanish but this includes c. 8000 day workers. If numbers of workers and local shoppers crossing the border are excluded from the statistics, the average daily number of visitors to Gibraltar is around 20,000.

TABLE 4.1 Numbers of visitors to Gibraltar, to the Upper Rock and Museum between 2009 and 2013 (includes daily workers crossing frontier).

Year	Land frontier	Coaches	Private motor vehicle	By Air	Cruise liner	Yacht	Upper Rock	Museum
2009	9,778,300	8098	2,531,800	186,049		3422	785,763	17,274
2010	11,071,300	8174	2,800,700	152,068		3189	772,009	15,116
2011	11,424,600	8159	2,960,200	193,484		3331	829,017	16,039
2012	11,310,700	8073	2,968,200	193,623		3890	801,596	12,974
2013	10,652,800	6127	2,592,200	193,368	278,179	2452	732,228	12,495



FIGURE 4.5 Visitors entering St. Michael's Cave on the Upper Rock.

Between 7 and 8% of total visitors arriving in Gibraltar visit the Upper Rock. The average annual number of visitors to the Upper Rock over the last five years is 784,100, an average of 2,150 per day. The highest numbers of visits take place between May and October, averaging 3,350 in July 2013. Lowest monthly figures are for January, when there is an average of 600 visitors to the Upper Rock per day. Most of those will visit the west part of the Gibraltar Nature Reserve and associated visitor attractions and sites (Figure 4.5). They travel by taxi, tour bus or private car, others by cable car to the top of the Rock. Relatively few walk all the way up the Rock. In addition, the Upper Rock is well-used by local Gibraltarians as a leisure area for walking and running particularly on weekends and holidays, and by local organisations including the Fire Brigade and Gibraltar Regiment for fitness training.

Figures for local residents visiting the Upper Rock are not available. Visitors to Europa Point were expected to be c. 203,000 in 2014 (projected figures from survey in July and August 2014).

Current position: Visitors to the nominated property

Within the nominated property, visits are currently focused on the Mediterranean Steps which are accessed from the west side at Jews' Gate (No 7 in Figure 4.6), or O'Hara's Battery (Number 11 in Figure 4.6) where the Mediterranean Steps reach the ridgeline of the Rock. Visits are on foot. Preliminary visitor statistics, gathered in summer 2014, revealed an anticipated annual number of visitors to the Mediterranean Steps to be in the region of 24,000, the equivalent of 3% of visitors to the Upper Rock. The average length of visit to the Upper Rock and Mediterranean Steps is three hours.

The remainder of the property has significantly fewer visits because of its limited access and control. The Gorham's Caves Complex (Figure 4.7) has restricted physical access with guided tours of <20 people at any one time. In 2013 about 200 people were given guided tours by Museum Staff, including tours of the excavations. Visits include those from international academic and professional groups (including English Heritage, Advisors to the UK Department for Culture, Media and Sport, ICOMOS-UK and the UK National Commission for UNESCO) and interested parties such as the Friends of Gibraltar or the Gibraltar Heritage Trust.

Collections of Middle and Upper Palaeolithic material, including that from the excavations of the caves, can be viewed at the Gibraltar Museum in town. The Museum receives 12,500 visitors per year at present.

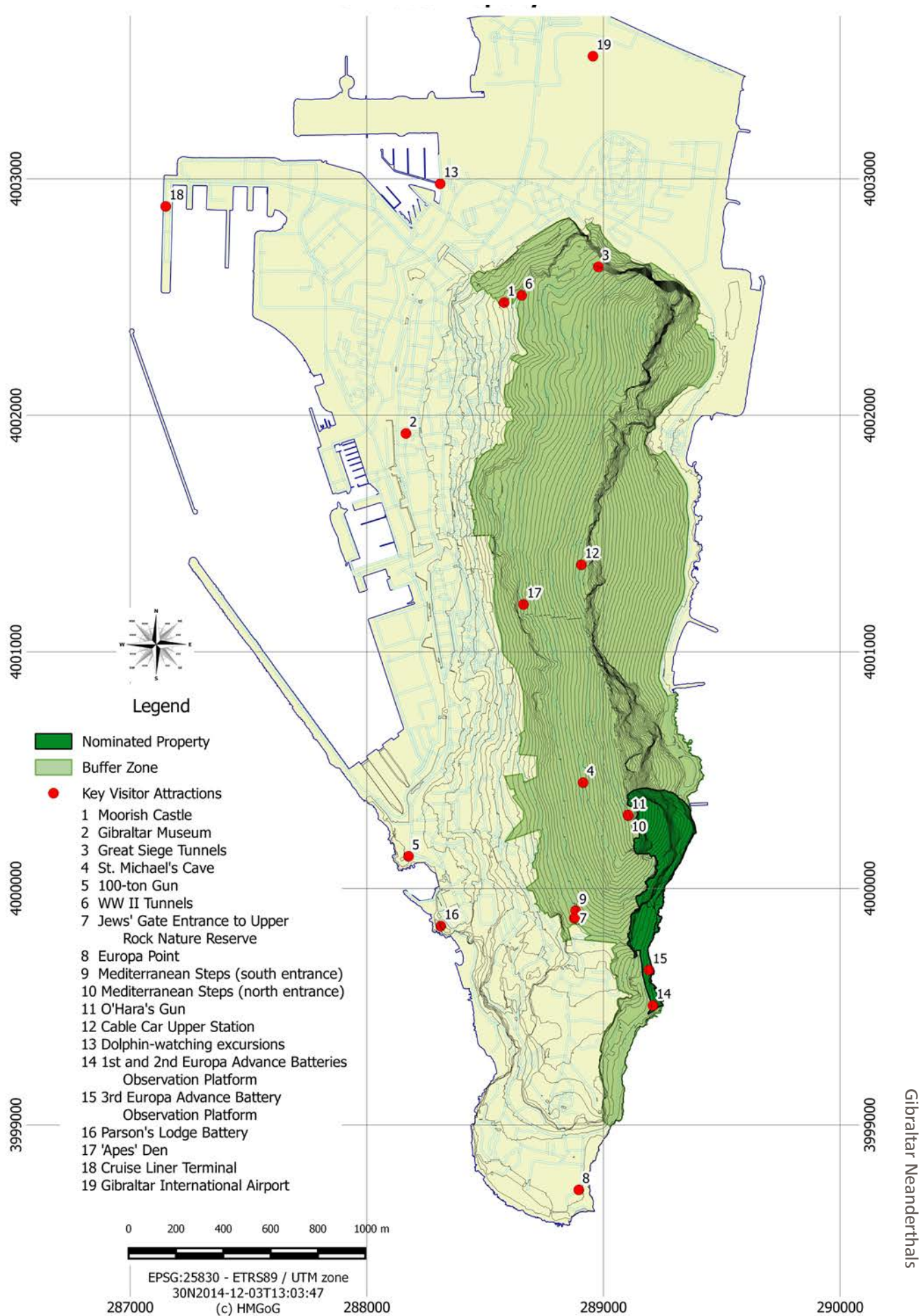


FIGURE 4.6 Location of main tourist sites in Gibraltar.



FIGURE 4.7 The view of the Gorham's Cave Complex from the 3rd Europa Advance Battery.

Visitor Management and Interpretation

Gibraltar has an established tradition as a tourist destination. The 19th Century Gibraltar directories highlight the attractions that could be visited in Gibraltar. Traditionally, these have been St. Michael's Cave, the Upper Galleries and the Moorish Castle. They remain major tourist attractions to the Upper Rock today. The Gibraltar Museum was opened in 1930 and continued the early Georgian and Victorian approach of highlighting the Rock's history and its monuments. Gibraltar was a significant place to visit during the 19th and early 20th Century tours of Europe and its sights were recorded by many travellers of their day (Carter 1777; Ford 1845). The current drive for World Heritage status has to be understood as a high point in a two-century old process of visitor management and interpretation. Having achieved a place in the United Kingdom's Tentative List, a veritable catalyst in this enterprise, Gibraltar is now actively developing visitor interpretation and management, not just for the nominated World Heritage Site but also for the wider heritage- and nature-based tourism of the Upper Rock.

Gibraltar Neanderthals

The current nomination thus presents a unique opportunity to integrate visitor management and interpretation for the whole territory and to take it to a new level. The candidate site offers the opportunity of interpreting cultural and natural features and themes in a unified, multidisciplinary, manner to a wide audience of all ages. It will complement existing heritage tourist sites, providing for a diversification of the product and the offer available to visitors, catering for repeat visits and for overnight stays as well as for the well-established day-visitor market.

The location of the property, away from the traditional tourist routes, also allows the potential for decongestion with the subsidiary effect of taking some pressure off other sites. A consequence of nomination is therefore the rationalisation and expansion of the heritage-nature tourist product, the site becoming a flagship project embedded within a broader framework of sites.

Specifically, the aim for the property is to maximise its potential by increasing awareness of its values and of the important universal story which it tells. That story is based around the Neanderthals, their way of life and the world in which they lived – about alternative ways in which humans found solutions to common problems during the climatic upheavals of the Pleistocene. It is also about the demise of the Neanderthals and the later arrival of modern humans. In this respect, the Gibraltar Museum has been an active founder partner in a consortium of European sites which was established in 2012 under the banner of Project Ice Age Europe (<http://www.ice-age-europe.eu/>). As part of this pan-European drive to integrate European Ice Age sites from research, education, and tourism perspectives, the Gibraltar Museum hosted the project's annual meeting in October 2014. A network of interactive touch screens in each site was introduced in November 2014 and will serve to link visitors to all sites in the network.

Planned activities in the future

The process of nomination of the candidate World Heritage Site has included discussion and the preparation of an integrated visitor strategy. The strategy is described in this sub-section. Its aim is to maximise access to the site while minimising impact, particularly to sensitive areas (e.g. archaeological deposits). At the same time, it is viewed as a strategy that will diversify the existing heritage and environment tourism product of Gibraltar.



FIGURE 4.8 Parson's Lodge (left) is currently the Gibraltar Museum's field station and will become the main interpretation centre for the candidate World Heritage Site. It has access to a pier from where boat trips will leave for the caves. In the background is the coast of North Africa.

Section 4 - State of conservation & factors affecting the property

The central aim has been to minimise the use of extraneous structures within the property itself while making use of existing heritage structures in peripheral areas. In this way heritage buildings and structures outside the property will be given a new lease of life. The integrated product will offer a range of alternative routes for visitors and these will complement those currently being prepared within the Gibraltar Nature Reserve. In addition to improved information and signage in existing tourist areas, the new routes will allow visitors to explore Gibraltar's heritage including the nominated World Heritage property. Elements of this new product have been put in place in 2014, others will follow during 2015 and the process will be under constant review thereafter. The main components are:

1 A new interpretation centre at Parson's Lodge Battery, Rosia Bay (No 16 in Figure 4.6 and Figure 4.8):

this is a Victorian Battery on a vegetated hill which harbours many plant species typical of the Neanderthal landscape. It lies outside the property and buffer zone. It is an ideal location, with spectacular views towards Africa, for an interpretation centre. It is on the tourist route that is taken by buses and taxis to the southernmost point of Gibraltar, Europa Point, that overlooks the Strait of Gibraltar and its impressive views of Africa and Jebel Musa – known in classical times as Mons Abyla, the southern Pillar of Hercules (Mons Calpe – Gibraltar being the northern Pillar). This location will interpret the Neanderthals and the wider heritage covering the interrelation between humans and the geological landscape, from natural caves to tunnels. Caves, fossil breccias and tunnels are to be found within the site making the visitor experience direct with heritage and natural elements. Adjacent to this location is a pier at the historically important Rosia Bay, best known as the site where Admiral Nelson's body was brought after the Battle of Trafalgar. The Parson's Lodge facility is expected to be open to the public, in its first phase, early in 2015 and the first phase works are currently being completed.

2 Specialised boat trips to view the property from the sea will be developed. Two options will be available: a dedicated tour that includes a visit to the interpretation centre at Parson's Lodge, followed by a boat trip to the Gorham's Cave complex from the adjacent Rosia Bay pier; and inclusion of the Gorham's Cave complex into existing dolphin boat trips that currently operate in Gibraltar. These visits will only exceptionally provide landing to view the caves directly. In such cases, visitors will be escorted at all times by Gibraltar Museum personnel. The caves are easily viewable and understood without need for landing. The number of visitors landing and visiting Gorham's Cave will be strictly controlled by an annual quota to be agreed with the International Scientific and Conservation Committee.

3 A five-million year transect will be developed as a new route from sea level to the highest peak, at 426m AOD, within the property. Differently coloured signs will identify for visitors which of the five morpho-tectonic steps (Figure 2.15) they are standing on. As they go up from sea level (representing the present day) to the highest peak (representing the Pliocene at 5.33 million years ago) visitors will be able to situate themselves along an exciting walk back in time.

4 Enhanced signage and information boards around the Mediterranean Steps and other parts of the property (Nos. 9 & 10 in Figure 4.6) will explain the "Neanderthal Story" throughout this extensive walk to the highest point of the Rock of Gibraltar at 426m AOD and will situate it in the wider temporal framework. The walk takes visitors through a cliff path full of plants which were present when the Neanderthals walked the Rock – one of the key messages of the interpretation strategy. Viewing platforms and information points will be put in place at the Europa Advance Batteries; and information will be available at all key tourist points, such as the Gibraltar Museum, Europa Point, Casemates and the airport. Parking for coaches and cars will be available at the viewing points and Europa Point.



FIGURE 4.9 A field study and research centre will be at the Moorish Castle which will house *inter alia* the collections from the site.

5 A field study and research centre at the Moorish Castle site (No. 1 in Figure 4.6 and Figure 4.9), housing *inter alia* the collections from the nominated property. The development of this site, which will include new laboratories and accommodation for visiting scientists, will release space for expansion of displays within the Gibraltar Museum and will have the added value of opening up a new historical monument to visitors. Works are in progress.

6 New displays at the Gibraltar Museum (No. 2 in Figure 4.6) enabled by the expansion of display space as the result of the rationalisation process that includes the new field study and research centre in the Moorish Castle. The Gibraltar Museum will interpret the Neanderthal story to visitors in the City from where they can move onto the Parson's Lodge Interpretation Centre or directly to the nominated World Heritage site.

7 Guided walking tours will allow visitors to have access to the interpretation centre, the Gorham's Cave complex viewing platforms (Europa Advance Batteries) and the walk on Mediterranean Steps. A Senior Guide was appointed by the Gibraltar Museum in October 2014 and has commenced preparatory work on a range of walking tours.

8 Enhanced web access will include a dedicated web site for the property including virtual tours of the caves and landscape.

9 Educational activities already include education packs for schools on the property; talks to schools and specific activities related to the property, and to global citizenship, covering the range of archaeological, environmental, geological and landscape elements, and arts-based interpretation including music, dance and drama. World Heritage Day will become part of the annual round of international celebrations, and participation in the World Heritage Youth Forum will be encouraged. Schools activities are designed in consultation with teaching staff and the Education Department. An Assistant Education Officer was appointed in September 2014 and a second one in November 2014, supporting the work of the Gibraltar Museum's Education Officer and reflecting the importance attached to this aspect of the work. Furthermore, the Senior Guide appointed in October 2014 (item 7) has been incorporated into the education team so that walking tours are incorporated as part of a wider educational programme. A Senior Scientific and Conservation Officer appointed to the team in November 2014 has substantial experience in running an educational archaeology facility for schools. This skill will be invaluable as the Parson's Lodge Interpretation Centre will be used for experimental archaeology demonstrations, supplementing the existing hands-on educational programme at the Gibraltar Museum.

Carrying Capacity

It is fully understood that the impact of visitors to sensitive sites is potentially damaging. It is not always easy to quantify the visitor carrying capacity of a site and, in the absence of a clear indication (which may not be possible even with data), the Gibraltar Museum applies the precautionary principle. The highly sensitive World War II "Stay Behind" Tunnels within the Buffer Zone, for example, are the subject of an annual quota of 200 visitors, always escorted by a museum guide. The caves in the Gorham's Cave Complex have only been visited during excavations in the summer months and under strict control. To minimize potential damage even further, the size of the archaeological team working at any time on site is capped at twenty.

In the case of Martin's Cave off the Mediterranean Steps, a security gate was placed in 2010 by the Gibraltar Museum on the cliff path leading to the cave. This measure was aimed at preventing unauthorised access to the cave. The actual Mediterranean Steps, themselves not an attribute of Outstanding Universal Value, will be the principal area of unrestricted public access within the site. This cliff walk has a long history of public access without damage and there is no reason to expect a change with inscription if achieved. Nevertheless, surveys of persons accessing the steps commenced in July 2014 with a view to establishing baseline data. Visitor numbers and impact indicators will be monitored on a regular basis.

In contrast with the busier western side – the Upper Rock (outside the property) – walkers enjoy a tranquil experience within the traffic-free Mediterranean Steps within the property. A limiting access factor to the steps is available parking on the lower entry point which is in the buffer zone although many visitors to the steps arrive on foot.

Predicted visitor numbers post-inscription

Predictions of numbers expected to visit the property are difficult. The site will, in any event, be promoted in a sustainable manner. Most of the access will be by remote visits, either to the viewing platforms in the Europa Advance Batteries or by boat without landing (Figure 4.10). The only direct access to the property will be onto the Mediterranean Steps.

Preliminary statistics of visitor numbers to Europa Point and the Mediterranean Steps, based on a survey conducted in July and August, 2014, offer a glimpse of potential visitor numbers to the Europa Advance site and to Mediterranean Steps. This survey revealed that the annual number of visitors to Mediterranean Steps was expected to be around 24,000 (24,061 \pm 10,527, at 2 σ) and the number of visitors to Europa Point around 203,000 (202,810 \pm 80,516, at 2 σ). Using the Upper Rock as reference point, as it receives the most number of visitors, then Europa Point receives around 27% of the Upper Rock traffic; Mediterranean Steps receives 3% and the Gibraltar Museum 2%.

A review of statistics over the past five years shows a stepped increase of 13% in visitors in 2010, with numbers peaking in 2011 and annual fluctuations around 5%. The fluctuations reflect local circumstances, changes in cruise ship itineraries and general economic conditions. A cumulative increase in visitors might be expected, which could be of the order of 5% over five years. With World Heritage inscription, and specifically taking advantage of visits to Europa Advance and new interpretation facilities at the Gibraltar Museum and Parson's Lodge, it is expected that the increase in visitors would be in excess of the predicted 5%.



FIGURE View of Gorham's Cave from the sea.
4.10

Prediction of expected numbers to view the site by boat is even more difficult. The best comparison is with current dolphin viewing boat trips which are highly successful but for which official statistics are not available. A conservative estimate may put the annual figure of tourists seeing dolphins from tour boats at 35,000. Estimating 10% of these visitors choosing to visit the caves by boat or as part of a dolphin cruise, then 3,500 visitors would be expected by this means.

Using these figures, estimating visitor numbers to Mediterranean Steps from 2014 survey results, Europa Advance site from Europa Point statistics, and taking a 25% estimate of Europa Point visits for Parson's Lodge statistics, we may estimate the potential initial numbers visiting the property or its interpretation facilities at just under 300,000 rising to close to 360,000 by 2019 (Table 4.2). These estimates should be taken as an upper limit and it is likely that the actual numbers will be lower given that there will have to be a gradual process of marketing and incorporation of the new product into existing tours. The numbers visiting the actual caves will be strictly managed and controlled at a much lower level.

TABLE 4.2 Predicted visitor numbers to various interpretation and visiting facilities related to the nominated property.

Site	2015	2016	2017	2018	2019
Europa Advance	200,000	210,000	220,500	231,525	243,101
Gibraltar Museum	16,000	16,800	17,640	18,522	19,448
Parson's Lodge	50,000	52,500	55,125	57,881	60,775
Boat	3,500	3,675	3,859	4,052	4,255
Mediterranean Steps	25,000	26,250	27,562	28,940	30,388
Total	294,500	309,225	324,686	340,920	357,967

(v) Number of inhabitants within the property and the buffer zone

Estimated population located within:

Area of nominated property:	0
Buffer zone:	50
Total	50
Year	2014

5. Protection and management

5.a Ownership

Ownership of the property rests with HM Government of Gibraltar apart from a small section (1.5 ha, 5.4% of the property) of the site under the ownership of the United Kingdom's Ministry of Defence (MoD) (Figure 5.1). All attributes of Outstanding Universal Value are wholly contained within non-leased government land. A few properties on the Upper Rock part of the buffer zone, on government land, are traditionally leased to private individuals. Small areas of the buffer zone are also under the ownership of MoD. The MoD section within the property, from the junction of Europa Advance Road and the Dudley Ward Tunnel runs north, as Burma Road, to the former Monkey's Cave Convalescent Hospital and the AROW Street Tunnel Complex for some 150m; it is the land access point for Gorham's and Vanguard Caves. Strict control by MoD over access enhances protection of the site.

5.b Protective designation

5.b.1 Legislation

The full list of relevant protective legislation is at Table 5.1; copies of the legislation may be found in sub-section 7b, appended as a separate document Volume 2. The most relevant Acts are the Gibraltar Heritage Trust Act 1989; the Town Planning Act 1999; Town Planning (Environmental Impact Assessment) Regulations 2000; the Nature Protection Act 1991 and the Nature Conservation Area (Upper Rock) Designation Order 2013.

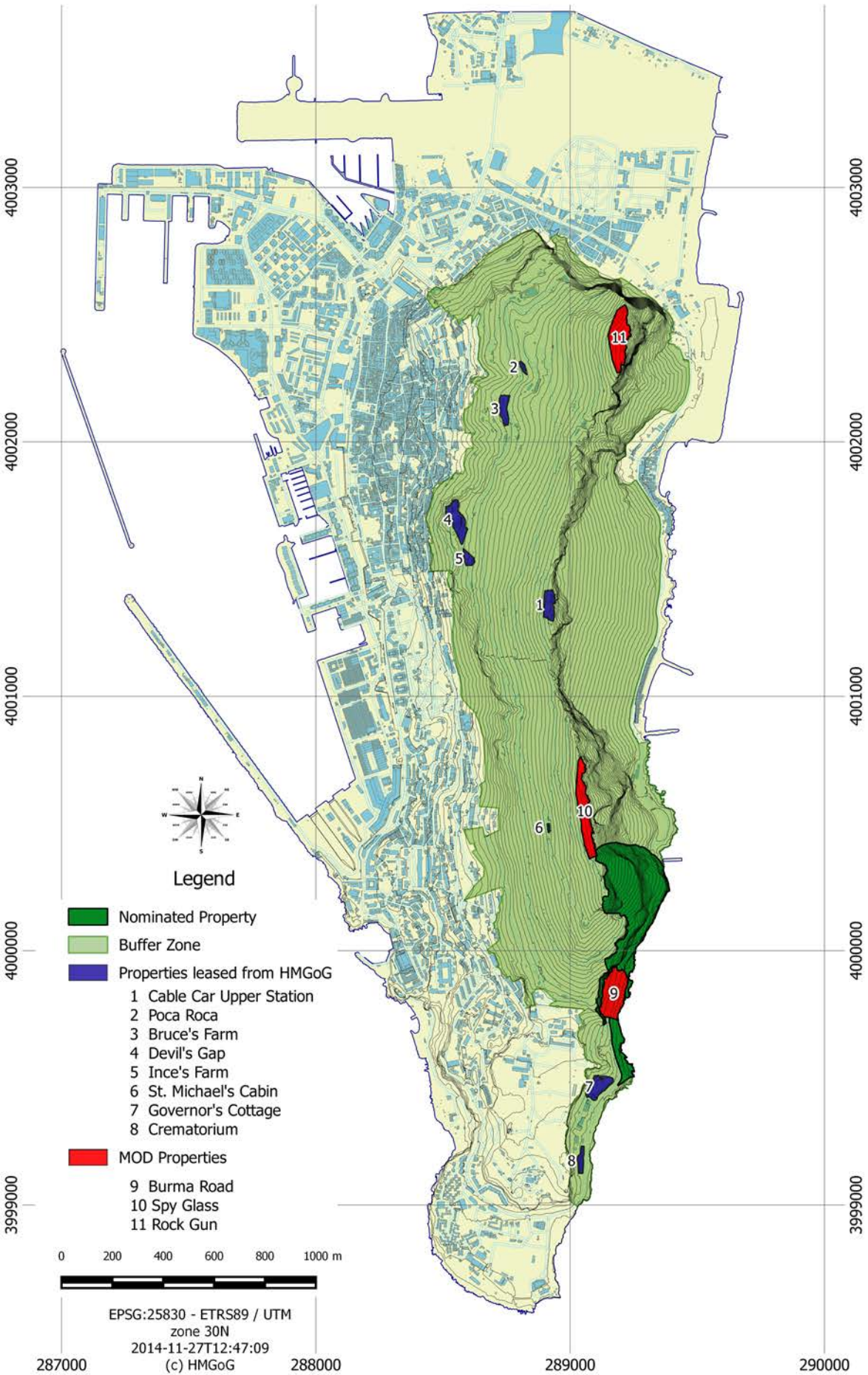


FIGURE 5.1 Land ownership within the Candidate World Heritage Site. The nominated property and nature reserve are owned by Her Majesty's Government of Gibraltar unless otherwise shown.

TABLE 5.1 List of relevant protective legislation.

Act, Ordinance or Regulation	Date	Covers	Responsible Body
GIBRALTAR HERITAGE TRUST ACT 1989			
http://www.gibraltarlaws.gov.gi/articles/1989-12o.pdf	1989	Cultural heritage, sites, monuments and buildings	Gibraltar Heritage Trust; HMGoG Ministry for Heritage
NATURE PROTECTION ACT 1991			
http://www.gibraltarlaws.gov.gi/articles/1991-11o.pdf	1991	Nature	HMGoG Dept. of Environment
NATURE CONSERVATION AREA (UPPER ROCK) DESIGNATION ORDER 1993			
http://www.gibraltarlaws.gov.gi/articles/1993s051.pdf	1993	Nature	HMGoG Dept. of Environment
NATURE CONSERVATION AREA (UPPER ROCK NATURE RESERVE) (PROTECTION AND REGULATION) REGULATIONS 1993			
http://www.gibraltarlaws.gov.gi/articles/1993s052.pdf	1993	Nature	HMGoG Dept. of Environment
NATURE CONSERVATION (DESIGNATION OF GIBRALTAR NATURE RESERVE) ORDER 2013			
http://www.gibraltarlaws.gov.gi/articles/2013s147.pdf	2013	Nature	HMGoG Dept. of Environment
NATURE CONSERVATION AREA (UPPER ROCK NATURE RESERVE) (PROTECTION AND REGULATION) REGULATIONS 1993			
http://www.gibraltarlaws.gov.gi/articles/1993s052.pdf	1993	Nature	HMGoG Dept. of Environment
NATURE PROTECTION ACT (POWERS AND DUTIES OF WILDLIFE WARDENS) REGULATIONS 2013			
http://www.gibraltarlaws.gov.gi/articles/2013s183.pdf	2013	Nature	HMGoG Dept. of Environment
NATURE PROTECTION (NATURE CONSERVANCY COUNCIL) REGULATIONS 2013			
http://www.gibraltarlaws.gov.gi/articles/2013s098.pdf	2013	Nature	HMGoG Dept. of Environment
ENDANGERED SPECIES ACT 1990			
http://www.gibraltarlaws.gov.gi/articles/1990-54o.pdf	1990	Nature	HMGoG Dept. of Environment
ENVIRONMENTAL PROTECTION (TREES) ACT 2014			
http://www.gibraltarlaws.gov.gi/articles/2014-01o.pdf	2014	Nature	HMGoG Dept. of Environment

EUROPEAN HABITAT DIRECTIVE			
http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN		Nature	HMGoG Dept. of Environment
MARINE NATURE RESERVE REGULATIONS 1995			
http://www.gibraltarlaws.gov.gi/articles/1995s143.pdf	1995	Marine natural	HMGoG Dept. of Environment
MARINE STRATEGY REGULATIONS 2011			
http://www.gibraltarlaws.gov.gi/articles/2011s013.pdf	2011	Marine natural	HMGoG Dept. of Environment
TOWN PLANNING ACT 1999			
http://www.gibraltarlaws.gov.gi/articles/1999-39o.pdf	1999	Building development, design	HMGoG Town Planning Dept.
TOWN PLANNING (BUILDING DEVELOPMENT CONTROL) REGULATIONS 2001			
http://www.gibraltarlaws.gov.gi/articles/2001s026.pdf	2001	Development control	HMGoG Town Planning Dept.
TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001			
http://www.gibraltarlaws.gov.gi/articles/2001s025.pdf	2001	Development control	HMGoG Town Planning Dept.
TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2000			
http://www.gibraltarlaws.gov.gi/articles/2000s013.pdf	2000	Planning and development decisions	HMGoG Town Planning Dept.
MARINE PROTECTION REGULATIONS 2014			
http://www.gibraltarlaws.gov.gi/articles/2014s180.pdf	01.01.2015	Nature	HMGoG Dept. of Environment
ENVIRONMENT (QUALITY OF BATHING WATER) REGULATIONS 2009			
http://www.gibraltarlaws.gov.gi/articles/2009s033.pdf	2009	Environment	HMGoG Dept. of Environment
GIBRALTAR PORT AUTHORITY ACT 2005			
http://www.gibraltarlaws.gov.gi/articles/2005-14o.pdf	2005	Marine	HMGoG Dept. of Transport
ENVIRONMENT ACT 2005			
http://www.gibraltarlaws.gov.gi/articles/2005-27o.pdf	2005	Environment	HMGoG Dept. of Environment
GAZETTE ON CAVES AND SCHEDULE A LISTED BUILDINGS			
Amendment late December 2014.	2014	Culture	HMGoG Dept. of Culture

The key provisions of the main Acts are:

Gibraltar Heritage Trust Act 1989

This is the principal legislation protecting heritage assets in Gibraltar, including the caves which are attributes of Outstanding Universal Value within the property. The Act provides for the establishment of a Gibraltar Heritage Trust and the Gibraltar Museum. It provides for the appointment of the museum's Curator who has responsibility for archaeology and related work, including excavation permits, undertaken within the territory of Gibraltar. It protects buildings and structures (including caves) in Schedule 1 from (a) any act of wilful destruction, injury or defacement; (b) wilful alteration, impairment or spoiling the character; (c) removal of any material or thing that forms part of the protected site; (d) the erection, building or placing on or against any such site; (e) enclosing any such site; (f) depositing litter or refuse; and (g) occupation or encroachment.

Town Planning Act 1999

The Town Planning Act establishes a Development and Planning Commission (DPC) with the function of the promotion of the health, safety, convenience, physical, economic and general welfare of the community, through undertaking the preparation of planning schemes for the physical development of such areas as the Government may direct, as well as for the type of buildings suitable for erection therein. It is the body that scrutinises all planning applications in Gibraltar. This Act prescribes (a) the contents of planning schemes and the power of the DPC; (b) the exhibition of schemes; and (c) the consideration of objections. The Act also prescribes Building Control measures including (a) the requirement of planning permission, (b) application for permits; (c) outline planning permission; and (d) the granting or refusal of permits. The requirements for Environmental Impact Assessments are provided in the Town Planning (Environmental Impact Assessment) Regulations, 2000.

Nature Protection Act 1991

The Nature Protection Act provides for the protection of wild animals and plants in Gibraltar. It also protects sites, including sensitive habitats including caves, cliffs and other geological formations as well as living organisms. This legislation also provides for appropriate assessment for land use plans. The Act meets all European Union obligations, such as the Habitats Directive, and provides for the setting up of reserves, the most relevant and notable being the Gibraltar Nature Reserve. The Nature Conservation Area (Upper Rock) Designation Order 2013, provides for the designation of the Gibraltar Nature Reserve with significant extensions that include the Catalan Bay Sand Dune and east side cliffs and caves.

5.b.2 Buffer Zone (Figure 1.1)

The buffer zone protects the property from adverse impact. As there is no industry or other potential source of physical impact on the property (other than potential disasters, Section 4.b) and access into the property is closely monitored, the function of the buffer zone is in protecting the biological reservoir and the visual aspect of the property. The planning system caters for this even outside the buffer zone itself. The western part of the buffer zone, the Upper Rock part of the Gibraltar Nature Reserve, protects the fauna and flora and is a pool of species which are also found within the property.

On the west and north sides the buffer zone is contiguous with the protected Gibraltar Nature Reserve, where there are strict regulations on planning and development and protection of species. The southern portion of the buffer zone follows the natural cliff morphology and protects the key views of the sea caves in the context of the entire property. These cliffs are also part of the Gibraltar Nature Reserve. The eastern buffer zone is also part of the Gibraltar Nature Reserve and is subject to its regulations. It acts as a reservoir of biodiversity and the massive cliffs and

dune also serve to protect the views of the northern rim of the property, though not the caves themselves which are hidden from view by the cliffs themselves. A 400-metre long strip of coast north of the property is also added to the buffer zone. The Catalan Bay Sand Dune is thought to cover caves with potential archaeology from the time of the Neanderthals. The dune's principal function is thus as a buffer of hidden archaeology.

The Nature Reserve contains a similar range of vegetation and fauna that characterises the Neanderthal landscape. The east and south parts of the buffer zone fall into two zones in the current Gibraltar Development Plan: Zone 4 (north end, to Europa Advance Road), and Zone 7 (Europa) (Figure 4.4).

A marine buffer zone extending into Gibraltar's Eastern Coastal Waters was considered, especially as the submerged Neanderthal landscape extends some 5km eastwards. However, the area is already adequately protected by its designation as a SAC, and there is a low risk of adverse impact.

5.c Means of implementing protective measures

5.c.1 General comment

The site has full legal protection as part of the Gibraltar Nature Protection Act (1991), Gibraltar Nature Reserve (Nature Conservation (Designation of Gibraltar Nature Reserve) Order 2013; Nature Conservation (Upper Rock Nature Reserve Protection and Regulation) Regulations 2013. Gorham's, Vanguard, Bennett's, Hyaena, Martin's and Goat's Hair Caves have full additional protection as Schedule 1 Category A (maximum protection) sites under the Gibraltar Heritage Trust Ordinance 1989.



FIGURE 5.2 Volunteers from the Gibraltar Museum's Caving Unit undertaking survey with view of Gorham's Cave Complex in the background.

Cultural Heritage and Natural assets in the Nature Reserve buffer zone are protected by the Gibraltar Heritage Trust Ordinance 1989 and the Nature Reserve Act and Regulations. The Nature Protection Act prescribes activities that may and may not be undertaken within the Gibraltar Nature Reserve. Licences are issued by the Minister for the Environment after consultation with the Nature Conservancy Council. Enforcement rests currently with the Royal Gibraltar Police although the Department of the Environment also has wardens operating within the Gibraltar Nature Reserve.

The Gibraltar Heritage Trust Act lists monuments and sites in schedules of protection. Permits related to listed sites and, more broadly, archaeological excavations are issued by the Minister for Heritage after consultation with the Gibraltar Heritage Trust and the Gibraltar Museum. It is envisaged that these processes will continue. Within the nominated property, the additional filter of the World Heritage Advisory Forum and the International Research and Conservation Committee, who will be consulted on all relevant issues related to the site, will be introduced. Enforcement rests currently with the Royal Gibraltar Police.

The existing protection measures for the Nature Reserve generally work well. The Upper Rock is secured at night by locked gates, with access for homeowners on the west side limited to that from the Upper Town. Local traffic is not allowed on the roads above St Michael's Cave, apart from tourist coaches, taxis and vehicles with special permits (e.g. for purposes of research). Visitor access to the Nature Reserve is by foot, cable car, taxi/bus tours or private car. The Upper Rock is well visited and there are some resultant issues of littering and graffiti, but little other damage. The east side dune is very difficult to access. Restrictions on any development within the reserve are well controlled. The fact that the buffer zone is so free of development is a measure of the effectiveness of protection.

Traditionally there is a very active interest in cultural and natural heritage in the area, and a deep pride in that heritage (Figure 5.2). There are societies active in the conservation of both natural and cultural heritage – for example the Gibraltar Ornithological and Natural History Society is responsible for monitoring wildlife and the Gibraltar Heritage Trust has several historic buildings in its care. In a small territory of only 9km², where most of the area is too steep for occupation, there is always pressure on land for development, but a pragmatic approach is adopted and development restricted as far as reasonably practicable. The residents themselves are vociferous in the protection of their heritage. Much of the Upper Rock and the property itself is pristine, which is remarkable as it is so close to a high density area. It is the best indicator of the site's long term resilience.

The Gibraltar Museum runs an annual programme of lectures and a major international conference (Calpe Conference) every three years which is well attended by the general public. Since 1997, the Calpe Conference has brought leading researchers to Gibraltar as speakers and has exposed the community of Gibraltar to a wealth of talent and knowledge that is unprecedented for a place of its size. It has included a major conference in 1998 which commemorated the 150th anniversary of the discovery of the Forbes' Quarry Neanderthal skull in 1848. At that conference, it was resolved that every third year thereafter the Calpe Conference would be devoted to a Neanderthal-related theme. Thus, the local community has been consistently exposed to the subject and the latest ideas and discoveries for a significant period. Local daily newspapers, radio and television regularly carry news stories on Gibraltar's heritage. In the past two years there has been a major emphasis placed on the world heritage bid, with numerous articles in the press and in local monthly magazines. Support for the bid is also expressed by a significant local following of Gibraltar Museum and Gorham's Cave pages in Facebook and on twitter. The Gorham's Cave Facebook page had 4,240 members in November 2014. Gorham's Cave has become a household name in Gibraltar.

5.c.2 Planning Procedures

Planning is regulated by the Town Planning Acts and Regulations 1999 and 2001, and by implementation of policies contained in the Gibraltar Development Plan 2009 (below section 5.d). The current Plan (section 7.b below) contains standard policies to protect the environment and cultural heritage, and also, for the Upper Town, a series of design principles to protect and enhance character. The Plan is divided into planning zones, and currently the nominated World Heritage Site and its buffer zone fall into three separate planning zones each with differing requirements (Figure 4.4).

The Gibraltar planning system took a major leap forward in 2012 with the introduction of regular public meetings of the Development Planning Commission (DPC), following the provisions of the 2009 Development Plan. Planning controls and procedures are increasingly strictly enforced, as the general policy to improve Gibraltar's environment is implemented. The protection of cultural heritage assets has been increased with the introduction of site assessment and field evaluation to inform planning decisions, and the increased involvement of the Gibraltar Heritage Trust and the Gibraltar Museum in routine development control matters.

Any development proposals have to be submitted to the Town Planning Department for approval, using a standard form of application. Recommendations are made by the Town Planner, on the basis of existing policy and the balance of all factors, and ratified by the DPC. There is an appeals procedure for unsuccessful applications through the DPC, which appoints an independent panel of assessors.

The basis for decision-making is the Development Plan. The Town Planner has drafted an Amendment which takes the nominated World Heritage property into full account with specific policies designed to safeguard the site's Outstanding Universal Value (Volume 3, Appendix 3). The buffer zone is protected from development by the Nature Protection Act and the small coastal strip of buffer zone outside its boundaries would be subject to the planning process, including a full environmental impact assessment utilising current ICOMOS guidance on Heritage Impact Assessments for World Heritage Sites (2011), and following the current Town Planning (Environmental Impact) Regulations 2000 as amended design and access statements would also be required.

5.d Existing plans related to municipality and region in which the proposed property is located (e.g., regional or local plan, conservation plan, tourism development plan)

The Gibraltar Development Plan covers the nominated property and buffer zone which fall into three zones of the plan. There is an existing Upper Rock Management Plan which covers large areas of the candidate World Heritage Site and buffer zone and a revised plan for the extended Gibraltar Nature Reserve is currently being drafted by the Department of the Environment. A Biodiversity Action Plan covers the species which are attributes of outstanding universal value within the property. Disasters and risk plans are reviewed periodically by the Civil Contingency Office of H. M. Government of Gibraltar and these plans relate to the entire territory and include such areas as fire and oil pollution risk which can potentially affect the site. A Management Plan for the nominated site and buffer zone was published in January 2015 (Volume 3). The plans are effective and several are being developed specifically for the nominated property to improve its protection. They are therefore consistent with the protection, conservation and management of the property.

TABLE 5.2 Existing plans relating to the property.

NAME OF PLAN	Date	Covers	Responsible body
GIBRALTAR DEVELOPMENT PLAN http://www.gibdevplan.gov.gi/pdf/parts12.pdf	2009	Town Planning, development, design principles	Town Planner; Gibraltar Development Plan Commission; Deputy Chief Minister
NOMINATED WORLD HERITAGE SITE MANAGEMENT PLAN	2015	Nominated World Heritage Site and buffer zone	Gibraltar Museum
UPPER ROCK NATURE RESERVE MANAGEMENT AND ACTION PLAN http://www.gonhs.org/documents/UpperRockNatureReserveManagementActionPlan.pdf	2005	Nominated World Heritage Site and buffer zone	Department of the Environment, Gibraltar, GONHS
GIBRALTAR NATURE RESERVE MANAGEMENT PLAN	2015	Nominated World Heritage Site and buffer zone	Department of the Environment, Gibraltar
ENVIRONMENTAL ACTION AND MANAGEMENT PLAN https://www.gibraltar.gov.gi/images/stories/PDF/environment/Environmental_Action_&_Management_Plan_2013.pdf	2012	Nominated World Heritage Site and buffer zone	Department of the Environment, Gibraltar
BIODIVERSITY ACTION PLAN, GIBRALTAR: PLANNING FOR NATURE http://www.gonhs.org/documents/BiodiversityActionPlan2006web.pdf	2006	Nominated World Heritage Site and buffer zone	GONHS, Department of the Environment, Gibraltar
H.M. GOVERNMENT OF GIBRALTAR MAJOR INCIDENT RESPONSE PLAN 2013-14	2013	Contingency Plans for a wide range of emergencies for the entire territory, including the candidate World Heritage Site and buffer zone. Includes 25 annexes covering a diversity of emergencies including maritime incidents, oil pollution at sea, fire on the Upper Rock and severe weather and alert response. Some of these annexes are classified.	Civil Contingency Office, HM Government of Gibraltar
H.M. GOVERNMENT OF GIBRALTAR PRELIMINARY FLOOD RISK ASSESSMENT https://www.gibraltar.gov.gi/images/stories/PDF/environment/Preliminary_Flood_Risk_Assessment_Report.pdf	2011	Covers the entire territory including the nominated property and buffer zone	Department of the Environment

5.e Property management plan or other management system

5.e.1 Introduction

A Management Plan covering the period 2015-20 was completed at the end of 2014 and published in January 2015. It is the guiding document for the management of the property and cross refers to existing and new management plans for the Gibraltar Nature Reserve. The Management Plan will be reviewed every five years and an action plan, derived from the Management Plan, will be reviewed annually. The Management Plan is Volume 3 of the nomination submission.



FIGURE 5.3 Steering Committee meeting of 3rd July, 2014.

The Management Plan focuses on the attributes of Outstanding Universal Value and how these will be conserved. It also deals with associative attributes and other values that are within the property but do not confer Outstanding Universal Value. In this way a holistic approach is developed for the protection of the entire site and the interests of all stakeholders and the community at large are catered for. The starting points of the management system which is embodied in the management plan are therefore the attributes themselves and the community and the way it sees and embraces those attributes. The management system thus includes an important element of feedback to stakeholders and the wider community, formalising what has been happening in an *ad hoc* manner for several years. Her Majesty's Government of Gibraltar has committed itself to the allocation of necessary resources to manage the site effectively through its agent, the Gibraltar Museum. The management plan will be a tool, together with the annual action plan, used in the annual submission for renewal and improvement of funding and other resources to

the government. The management plan will be supported by subsidiary plans, including the research and conservation strategy, a business plan, visitor management and risk preparedness. Training programmes, involving the local youth community, will feature prominently as the annual action plans are developed.

A Steering Committee of stakeholders (Figure 5.3) was established in preparing this nomination. It included representatives of Government Departments and NGOs. On inscription this committee will become the advisory body for the site, known as the World Heritage Advisory Forum. The local community will be represented via the two major NGOs – the Gibraltar Heritage Trust and the Gibraltar ornithological and Natural History Society. The advisory forum will meet at least once a year (Section 5.e.2) to discuss management issues relating to the site's on-going interface with existing infrastructure, departments and the local community. It will also review long-term plans.

5.e.2 Governance Structure

The governance diagram (Figure 5.4) outlines the key elements of the proposed management structure for the property. As the State Party, the United Kingdom Government is responsible for liaison with UNESCO, including the submission of nominations and periodic reports, and is the channel for any other official communication with UNESCO. The Department for Culture, Media and Sport (DCMS) is ultimately responsible for World Heritage matters, though the lead department for UNESCO is the Department for International Development. The DCMS is also responsible for providing technical advice and support to candidate world heritage sites and to inscribed properties.

However, the key responsibility for this site rests with HMGoG, and given the significance of the project and multiple stakeholders, the project for nomination and the future management of the property, once it is inscribed, will be led by the Deputy Chief Minister who will report to Parliament. At present a broad spectrum of stakeholders constitute a Steering Committee. Once inscribed, this Steering Committee will become the Advisory Forum. The WHS management will be overseen by this Advisory Forum - representing relevant government departments, non-departmental organisations with interests in the property, community and business representatives, and technical support bodies from the UK which advise the UK Government on world heritage. The Deputy Chief Minister will be the Chairman of the Advisory Forum. In effect this Forum will replace the WHS Steering Group which was established in 2013 to oversee the production of the nomination and which will continue until the nomination is inscribed. The composition of the Forum is very similar to that of the Steering Group.

The Advisory Forum will oversee the project and will contribute to developing the Management Plan (Volume 3) and its revisions, monitoring its implementation, and providing policy advice and support. The Forum will specifically monitor the key performance indicators (Section 6.a; Table 6.1). Members of the Forum may be responsible for implementation of some aspects through collective or individual action, and may assist in promoting the property and its values within Gibraltar and further afield. The Forum will normally meet once a year (or more often if required). The Forum is not, however, a decision-making body. Decision-making rests with either HMGoG or with the Executive Management Group as delegated. Membership of the Advisory Forum is set out in Table 5.3. The membership is structured to ensure organisational continuity, necessary as individual post-holders will change through time.

Responsibility for day-to-day policy and operational matters sits with the Executive Management Group, which is already established and functioning. HMGoG has delegated responsibility for the world heritage property to the Director of the Gibraltar Museum, who will for these purposes be called the Director of the World Heritage Site (DWHS). The DWHS is responsible for developing policy, strategy and the Management Plan, and its implementation, for preparing reports to the Advisory Forum and Government, for promotion and operation of the site. DWHS is responsible for a world heritage team which is based at the Gibraltar Museum and its field stations.

UNESCO

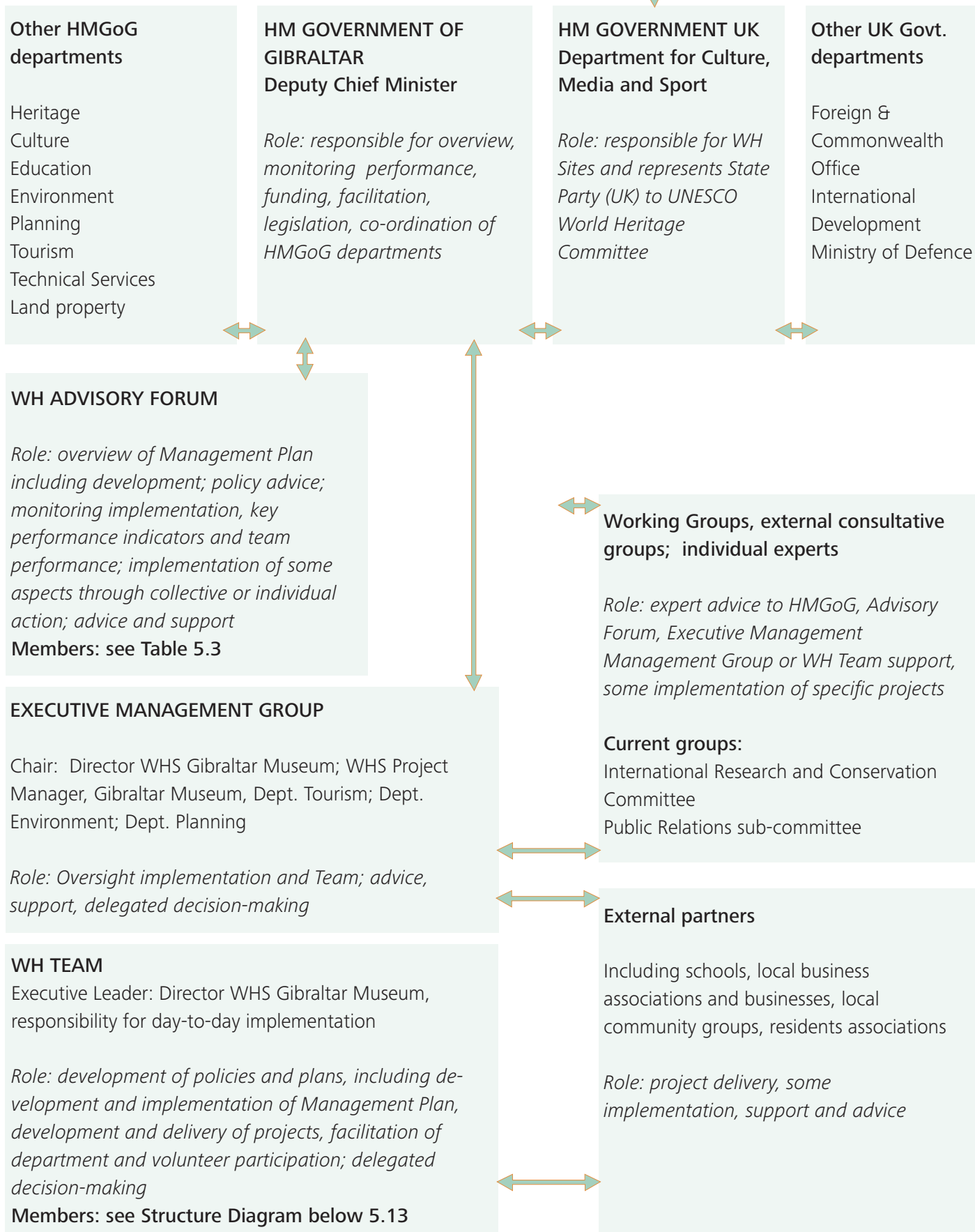


FIGURE 5.4 Proposed governance structure for nominated property.

TABLE 5.3 Proposed composition of WHS Advisory Forum

Organisation	Individual	Role
HM Government of Gibraltar Deputy Chief Minister	Dr J Garcia	Advisory Forum Chairman
Gibraltar Museum	Professor C Finlayson	Director World Heritage Site. Delegated responsibility from HMGoG for management of the World Heritage Site Executive Management Group Chair. Specific responsibility for research. Executive Leader WH Team
Gibraltar Museum	Dr G Finlayson	World Heritage Site Coordinator. Specific responsibility for site conservation.
Department of the Environment	Dr L Mesilio-Torres	Member WH EMG
Planning Department	Mr P Origo	Town Planner, Member WH EMG
Office of the Deputy Chief Minister	Mr M Sanguinetti	Project Manager, Member WH EMG
Gibraltar University	Dr D Fa	Education
Office of the Deputy Chief Minister	Mr C Sanchez	The Deputy Chief Minister has overall responsibility for the World Heritage Site, as its management involves a number of government departments and NGOs.
Gibraltar Tourist Board	Mr N Guerrero	Member WH EMG
Gibraltar Botanic Gardens	Dr K Bensusan	Director
Gibraltar Museum	Mr S Finlayson	WHS Operations, Interpretation and Projects
Ministry of Defence	Nominated representative	MOD property management and security
Gibraltar Heritage Trust	Dr K Farrell	NGO with a statutory responsibility for cultural heritage, representing the local community
Gibraltar Ornithological and Natural History Society	Mr C Perez	NGO, representing the local community
Nature Conservancy Council	Dr A Menez	HMGoG appointed body
International Research and Conservation Committee	Professor M Yang	Standing Committee
HMGoUK Department for Culture, Media and Sport	Nominated representative	State Party Liaison

Support for the EMG and WHT is provided through Government Departments, by the Gibraltar Heritage Trust and the Gibraltar Ornithological and Natural History Society, and other members of the Advisory Forum. In addition there is a standing international committee to advise on research and conservation, including archaeological investigations, with an international membership (Table 5.4). This Committee's first meeting was held on 17th September, 2014,

when the role and terms of reference were discussed and plans for 2015 were reviewed. Its main remit is to provide guidance and peer scrutiny of archaeological, palaeontological, geological and conservation management matters. It also assists in disseminating information about the site.

In addition, *ad hoc* task-and-finish groups will be appointed for specific elements as needed – for example on interpretation strategy, community engagement *inter alia*. Archaeological and scientific investigations will continue in partnership with the international team already established which currently includes universities and museums in the United Kingdom, Spain, and other countries shown in Appendix 3.

TABLE 5.4 Standing International Research and Conservation Committee

Name	Organisation
Professor Minja Yang (Chair)	President of the Raymond Lemaire International Centre for Conservation, Leuven, Belgium and former Deputy Director UNESCO World Heritage Centre, Paris
Professor Geoff Bailey	University of York, United Kingdom
Professor Mina Weinstein Evron	University of Haifa, Israel and Mount Carmel WHS
Dr Juan José Negro	Doñana Biological Station, Doñana WHS
Professor Eudald Carbonell	Universitat Rovira I Virgili, Spain and Atapuerca WHS
Professor Clive Finlayson	Director Gibraltar Museum, representing the site
Dr Geraldine Finlayson	WH Site Coordinator

5.f Sources and levels of finance

H.M. Government of Gibraltar is fully committed to the successful regeneration and interpretation of this unique property and adjoining areas. It is the main source of capital and recurrent funding for the project. It also provides an inter-departmental backup: several government departments are already involved in the project and they include the Ministries for Heritage, the Environment, Tourism and Technical Services. This guarantees an important level of assistance as these departments are working closely to deliver on the project and maintain support post-nomination.

Recurrent costs are estimated for the 2014-15 financial year (Table 5.5, HMGoG financial year is 1 April-31 March). These estimates have been derived using the following criteria given that the site will be a new one and there are no historical costs on which to base the estimates. The first item is an estimate of proportional cost of existing staff to the World Heritage which is based on current and expected commitment to the project. Items 2 and 3 reflect new staff who have been recruited. This includes a commitment of three new full time posts for the site (two senior scientific and conservation officers and one senior guide/site manager). It also includes a cost estimate for a project manager who was seconded to the team in 2014. These new posts represent a 98.9% increase in the staff budget for the site. Research and educational costs are based on real costs reflected in the 2012-13 Government estimates. Operational and running costs are based on a 50% estimate of 2013-14 running costs for the Gibraltar Museum and its related facilities (e.g. Parson’s Lodge Field Station). HMGoG has funded the Gibraltar Museum in its archaeological programme of works for the past 25 years and the annual Calpe conferences since 1997 and this project is seen as a natural extension to that commitment.

Peripheral costs related to the running of areas of the Upper Rock, which includes parts within the nominated World Heritage Site, also have a bearing on the future running of the site. The 2013-14 estimate for a contract for maintaining the Upper Rock was £296,000. HMGoG is committed to maintaining, or improving where possible, levels of recurrent funding for the Gibraltar Museum, the nominated property and the nature reserve. HMGoG is also fully committed to the capital funding of all works related to the project.

TABLE 5.5 Recurrent costs estimated for 2014-15 financial year.

Item	Budget 2014-15 (£)
1. Existing Gibraltar Museum Staff contribution to candidate WHS	136,958.50
2. Contribution to candidate WHS from new Gibraltar Museum staff	17,317.50
3. New staff specifically appointed to candidate WHS	76,140.00
4. Seconded Project Manager	42,000.00
5. Calpe Conference expenditure dedicated to WHS	40,000.00
6. Research	38,000.00
7. Education and Outreach	10,000.00
8. Operational and running costs	93,000.00
Total	453,416.00

The research programme has also benefited from extensive collaboration with major research centres in Europe, North America and elsewhere. This has resulted in joint publications and the offsetting of costs, such as laboratory fees, through the creation of collaborative frameworks with shared publication. This approach will continue and is expected to expand even further. Its success has been the direct result of the uniqueness of the site and its massive research potential for answering questions of a universal nature. The project also benefited from EU funding in 2002-04 under the title PalaeoMed, with collaboration with Spanish and Italian institutions under the Interreg IIIB Medocc programme. The project also had an EU-funded post-doctoral researcher on a two-year term which ended in December 2014.

5.g Sources of expertise and training in conservation and management techniques

All skills and expertise necessary for the conservation and management of the site are available. Locally-available sources of expertise include: museum-trained staff in collections management and conservation, a highly experienced multi-disciplinary research team and staff experienced in heritage site management (including interpretation and guiding). The Gibraltar Tourist Board runs a strict system of licensing tourist guides who are trained in relevant aspects of local heritage and natural history. With nomination, special courses will be arranged by the Gibraltar Museum via the Gibraltar Tourist Board. This array of expertise is supplemented by internationally available sources through existing collaborations (Table 5.6).

TABLE Expertise available
5.6

Expertise	Museum Staff	Other Local sources	Internationally
Terrestrial Archaeology and History	*	*	*
Marine Archaeology and History	*		*
Documentary Research	*	*	
Palaeontology	*		*
Zoology	*	*	
Botany	*	*	
Geology			*
Artefact/material conservation	*	*	*
Collections Management	*	*	
Museum Display/exhibition	*	*	
IT & Database management	*	*	
Research & Publications	*	*	
Photography	*	*	
Conservation Management	*		
Cultural Heritage, policy and implementation	*	*	
Environmental	*	*	
Archives and documentation	*	*	
Visitor management	*	*	
Interpretation and display	*	*	
Health & safety		*	
Finance	*	*	
Human resources	*	*	
Project management	*	*	
Graphics	*	*	
Mapping and Survey	*	*	
Buildings maintenance		*	

5.h Visitor facilities and infrastructure

Gibraltar has a long history in tourism, as it is a mainstay of the economy and it is against this backdrop that the UNESCO World Heritage bid is extremely important, as if it were to be achieved, it would add another dimension to the existing product. As described above in section 4.b (iv), the total annual visitor footfall in Gibraltar exceeds 11 million, attracted by the wide array of heritage and natural assets and by the shops and amenities. A very high proportion of visits are day trips (estimated at 86% of visits) (Figure 5.5).



FIGURE 5.5 A very high proportion of visits to Gibraltar are day trips (estimated at 86% of visits). Photograph shows Gibraltar Coach Park.

There is a well-established tourism infrastructure to cater for these visitors (Figure 5.6) with many restaurants, bars and shops and a good city bus service. Destination management companies provide dedicated tours by minibus to tourist sites and this is complemented by a taxi service and tours for a more personal touch. There are currently 440 Gibraltar Tourist Board licenced guides who are trained to conduct tours by bus, taxi or the very popular walking tours. For longer visits, hotel guests can enjoy a spread of three to five star accommodation and more hotels are being built to cater for demand. There are currently some 198,000 rooms available annually (1200 beds). The nearest accommodation to the property is the Caleta Hotel, Catalan Bay. Other hotels – the Rock, the Elliott, the Sunborn, the Bristol and the Cannon - are situated in the town. There is Youth Hostel accommodation in the town, and an array of self-catering apartments and bed and breakfast establishments.

Gibraltar Neanderthals The Upper Rock Nature Reserve is the mainstay of the current tourism product and within it can be found the world famous “Rock apes”, Barbary macaques that roam freely. Tourism visits mainly focus on the west and top of the Rock and are largely by coach tour or taxi, with a significant number of visitors on foot or in private cars. Unique assets such as St. Michael’s Cave, a huge grotto in the centre of the Rock, the Great Siege Tunnels, excavated in the late 1700s and the Moorish Castle rebuilt in the early 1300s give Gibraltar its rich heritage product. All these lie outside the nominated property but within the buffer zone. As Gibraltar has always been a fortress, there are countless vestiges of the different occupations, from the Moorish, through the Spanish and finally to the British. Moorish baths and mosques lie side by side with synagogues and Catholic churches and all surrounded by defensive city walls and fortifications.



FIGURE 5.6 The total annual visitor footfall in Gibraltar exceeds 11 million, arriving by land (car, coach, foot; parties and individuals), by sea on cruise liners (284,870 in 2013) and by air at the international airport (189,000 in 2013).



FIGURE 5.7 In 2013 some 730,000 tourists visited the Upper Rock. Photograph shows tourists on the Upper Rock.

In 2013 some 730,000 tourists visited the Upper Rock (Figure 5.7). In addition, it is well-used by local Gibraltarians as a leisure area particularly on weekends and holidays (see 4.b.(iv) above). Service facilities for visitors to the Upper Rock include information boards, car parking, and lavatories at Jews' Gate (the entry to the Mediterranean Steps); information, a shop, cafeteria and lavatories at St Michael's Cave. There is access to the top of the Rock by cable car from the town (Figure 5.8), and there is more information, shops, cafeteria and lavatories at the cable car stop. There is no accommodation on the Upper Rock, but the scale of the territory is small and accommodation in town is close by.

Within the property, visitors are focused on the Upper Rock. The Mediterranean Steps are accessed from the west side at Jews' Gate (No. 9 in Figure 4.6), where visits are on foot, either completely or via the cable car to the top of the Rock and to O'Hara's Battery where the Mediterranean Steps reach the apex of the Rock (No. 10 in Figure 4.6). There are no detailed figures for visitor numbers available at present, but a survey in summer 2014 indicates that the annual figure is of the order of 24,000 (see above 4.b.(iv)). Access by use of the Mediterranean Steps is safe and appropriate to the site, though visitors need to take care on the steep slopes and steps. Few visitors stray off the established paths. There are appropriate safety barriers where cliff edges are close to paths.



FIGURE 5.8 Visits to the Mediterranean Steps are on foot, either completely or via the cable car to the Top of the Rock.

There is some signage and information boards along the Mediterranean Steps, but it is currently small scale in an effort not to clutter a place of natural beauty. There is significant scope to improve information and provide better interpretation in an appropriate manner and scale, and this is in hand with new signs starting to be put up during July 2014 (Figure 5.9). The remainder of the property has significantly fewer visits because of its present lack of access. Gorham's Caves Complex has restricted access with guided tours of <20 people at any one time.



FIGURE 5.9 New signs being erected in July 2014.

Collections of Middle and Upper Palaeolithic material, including those from the excavations of the caves, can be viewed at the Gibraltar Museum in town. Access schemes, to improve interpretation further are in progress and are described in section 4.b (iv). The Gibraltar Museum is additionally part of the Ice Age Europe Project which is developing visitor facility infrastructure across a network of major sites in Europe.

Overall, current facilities are suitable for the visitor market. Facilities on the Upper Rock have been improved since 2013 and include better provision for disabled access. The new range of options for visitors (e.g. the interpretation centre at Parson's Lodge) will enhance visitor facilities even further. All such improvements will support the vision, aims and objectives of the Management Plan in providing responsible access to and interpretation of the nominated property.

5.i Policies and programmes related to the presentation and promotion of the property

The two key strands of the World Heritage Convention are: conservation and presentation of the property. Articles 4, 5 and 27 of the Convention (Table 5.7) outline UNESCO's expectations. Archaeological, palaeontological and geological sites, especially those related to early humans, are generally less accessible to the public, and are of relatively lower visibility, than monumental sites. Their meaning is more difficult to grasp as a result. The Gibraltar site offers a unique challenge of interpretation and has the potential to become a model for early human sites in other parts of the world.

TABLE 5.7 Convention articles related to presentation and promotion of the property.

Article 4

Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage ... situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources...

Article 5

To ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage ..., each State Party to this Convention shall endeavour:

1. to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes;

Article 27

1. The States Parties to this Convention shall endeavour by all appropriate means, and in particular by educational and information programmes, to strengthen appreciation and respect by their peoples of the cultural and natural heritage...

There is a local, human, infrastructure that is the community itself. Local community awareness and support for, and pride in, their natural and cultural heritage is well-embedded in many facets of their lives, including schools programmes, arts and cultural events and not least tourism. This interest is reflected in the number of local visitors to the annual Gibraltar Museum Open Day (Figure 5.10), with figures in the last ten years representing between 2 and 4% of the population of Gibraltar (Table 5.8).

TABLE 5.8 Number of visitors attending the Gibraltar Museum Annual Open Day in the last ten years.

Year	Number of Visitors
2005	739
2006	821
2007	533
2008	837
2009	677
2010	501
2011	700
2012	700
2013	1100
2014	755



FIGURE 5.10 The popular annual Gibraltar Museum Open Day regularly features archaeological demonstrations related to early human (including Neanderthals) in Gibraltar. The photograph shows a fire-making demonstration.

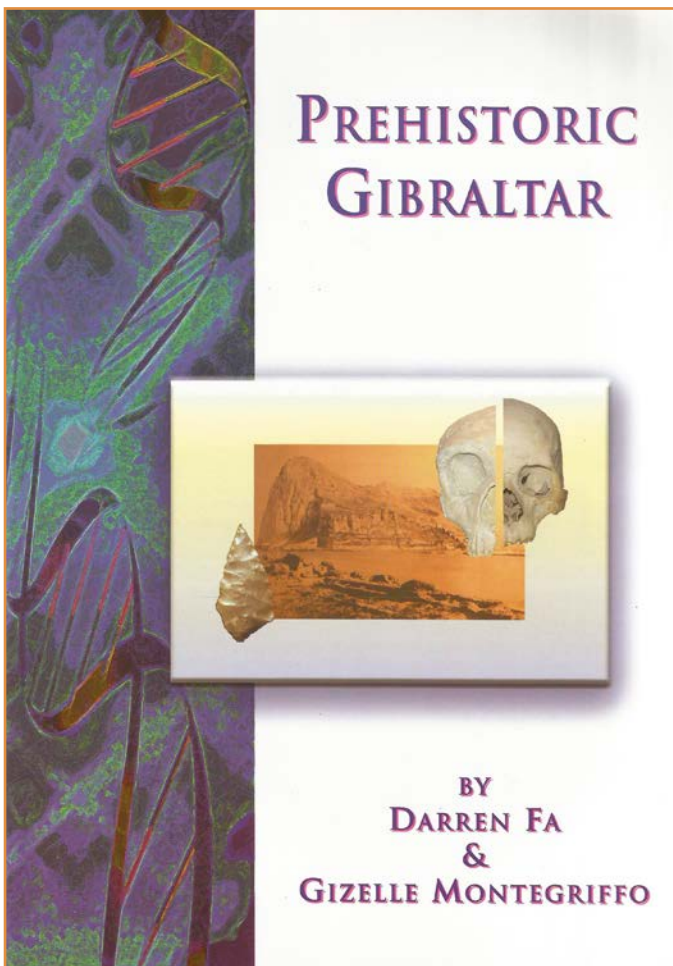


FIGURE 5.11

The book "Prehistoric Gibraltar" is part of the teaching aids produced by the Gibraltar Museum in conjunction with the Department of Education.

The Gibraltar Museum has for the past fourteen years had an active hands-on programme on human evolution, including the Neanderthals, for local schools and also visiting schools from abroad (Figure 5.11). It is run in conjunction with the Department of Education. The programme includes books, worksheets and teaching aids, including box tool-kits, which are kept in each school and also in the Gibraltar Museum. The development of experimental archaeology demonstrations in the Parson's Lodge Field Centre is seen as a continuation in the development of this Educational Programme which has been welcomed in the many international fora in which it has been presented.

As part of its activities promoting the Neanderthals and the work inside the property, the Gibraltar Museum organises an annual public lecture series. This is well-attended reflecting local interest in the subject. In addition, every third year, the annual Calpe Conference which is sponsored by the Government of Gibraltar develops the human evolution theme. An impressive array of international speakers attends the conference which is open and free to the local community. In this way, they are exposed to the leading researchers in this field, which is unique for a community of its size.

The use of digital media has proved very successful in engaging the local community. In addition to the museum's website in which day logs of excavations are posted, the museum also has Facebook pages on Gorham's Cave and the World Heritage Bid (<https://www.facebook.com/groups/202777843167670/>) which have over 4,240 and 4,000 members respectively. (January 2015) (Figure 5.12). Its role is stated as:

“(a) To inform as many people as possible on the values of the Gorham's Cave Complex. Why it is so special and unique in the world and why it deserves to become a World Heritage Site

(b) To ask for your support by joining our page. It is vitally important for us to show that this bid has the support of the local community, and also from people throughout the world.”

The image displays two screenshots of Facebook pages related to Gorham's Cave in Gibraltar. The left screenshot shows the main page of 'Gorham's Cave (Gibraltar) - The Neanderthal Story', which has 4,056 likes and a post about a World Heritage Bid. The right screenshot shows a group page for the same topic, with 4,235 members and a post about the work at Gorham's Cave.

FIGURE 5.12 The Gibraltar Museum has a Facebook Group on Gorham's Cave and the World Heritage Bid which has 4,240 members.

The large number of licenced guides on the Rock (440 plus) gives an indication of a strong level of commitment and understanding. There are many active societies and organisations including the Gibraltar Heritage Trust and the Gibraltar Ornithological and Natural History Society and the History Society. There are frequent heritage and nature articles in the press and media and other publications. There is, in summary, a long history of awareness and active interest in the heritage of the Rock and its environs, going back to explorations of the 18th and 19th centuries at least. The history is exceptionally well-documented, and the archives provide a resource unparalleled in many areas. Gibraltar has a long history of conservation and education. Events and programmes include schools activities and curricula, talks and lectures, international conferences such as the Calpe Conference, museum and other local exhibitions. The diverse experiences which are available offer opportunities for public engagement with their heritage at a variety of levels, in a variety of places.

As described in section 4.b (iv), a place on the United Kingdom's Tentative List has provided a catalyst to enhance the Gibraltar visitor experience and to promote awareness and understanding of the Rock's earliest inhabitants. This product will add to existing heritage and natural tourist sites which have a well-developed infrastructure. In addition to improved information and signage in existing tourist areas, it is proposed to offer a range of options for new routes to explore Gibraltar's heritage including the WH property. Four visitor strands have been identified: visitors by bus/taxi, visitors by sea, visitors by private vehicle and walking tours. An interpretation centre will be established at Parson's Lodge Battery, Rosia Bay. It is on the tourist route that is taken by buses and taxis en route to the southernmost part of Gibraltar, Europa Point, that overlooks the Strait of Gibraltar and its impressive views of Africa and Jebel Musa – known in classical times as Mons Abyla, the southern Pillar of Hercules (Mons Calpe – Gibraltar being the northern Pillar).

A field study and research centre will be at the Moorish Castle which will house *inter alia* the collections from the site. The development of this site will release space for expansion of displays within the Gibraltar Museum and will have the added value of opening up a historical monument that has been closed until now, to visitors. Specialised boat trips to view the property from the sea will be introduced; viewing platforms and information points will be put in place at the Europa Advance Batteries; and information will be available at all key tourist points, such as the Gibraltar Museum, Europa Point, Casemates and the airport. Parking for coaches and cars will be available at the viewing points and Europa Point.

Enhanced signage and information boards around the Mediterranean Steps will explain the "Neanderthal Story" throughout this extensive walk to the highest point of the Rock of Gibraltar at 426 metres. The walk takes visitors through a habitat full of plants which were present at the time of the Neanderthals – one of the key messages of the interpretation strategy.

Visitors by bus/taxi

The tours would originate at the pick-up points in town, the cruise or coach terminal. This tour would be integrated as part of existing tours or be exclusive to the Neanderthal experience. The tour would include a visit to the interpretation centre at Parson's Lodge Battery, together with a stopover at the viewing platforms overlooking the Gorham's Cave complex. Guides will be present to help visitors and provide additional information.

Visitors by sea

Two offerings would be available:

- A dedicated tour that includes a visit to the interpretation centre at Parson's Lodge, followed by a boat trip to the Gorham's Cave complex.
- Inclusion of the Gorham's Cave complex into existing dolphin boat trips that currently operate in Gibraltar.

Visitors by private vehicle

Over two and a half million vehicles enter Gibraltar annually (2013 statistics) and many of them bring tourists. These visitors would have access to the interpretation centre and the viewing platforms above the Gorham's Cave complex. They could also access Mediterranean steps on foot with parking at Jews' Gate.

Walking tours

The visitors would have access to the interpretation centre, the Gorham's Cave complex viewing platforms and the walk through Mediterranean Steps.

A full visitor Management Plan will be drafted in 2015 (see Volume 3, section 21, item 4/001).

5.j Staffing levels and expertise (professional, technical, maintenance)

Good management of the property requires a wide range of skills, from professional to technical maintenance. The range of skills available to the project is outlined in Table 5.9.

The work on the WHS has been undertaken to date as a partnership involving local Gibraltar organisations and a large international team. The expertise within that team is extensive. Engagement with other world heritage site managers will be an aim. Already the Gibraltar Museum has a signed framework collaboration agreement signed with the Biological Station of Doñana (World Heritage Site, Spain) and discussions are taking place to formalise similar collaboration which has been on-going with the Atapuerca World Heritage Site (Spain) for a number of years. Other collectives, e.g. UK Overseas Territories Forum, will be engaged in the process.

It is proposed to continue to work and manage the property as a partnership enterprise ensuring key skills are available in-house in the dedicated WHS team or in the immediate support from local departments and organisations, with the necessary other specialist and professional skills brought in as needed. Technical, maintenance and support services will largely be locally-sourced, but will also be sought from specialist organisations in Spain – for example craft skills – and elsewhere as necessary.

A training programme for all staff will be implemented as part of the Management Plan, and both technical and soft skills will be covered. This will be an extension of similar schemes currently run by the Gibraltar Museum and will guarantee continuity of skills through time.

TABLE 5.9 Skills and expertise available

EXPERTISE	WORLD HERITAGE TEAM	LOCALLY (GOVERNMENT OR NGO/OTHER ORGANISATIONS)	INTERNATIONALLY
Terrestrial Archaeology and History	*		*
Marine Archaeology and History	*		*
Archaeological sciences	*		*
Palaeontology	*		*
Zoology	*	*	
Botany	*	*	
Geology	*		*
Artefact/material conservation	*		*
Documentary Research	*	*	
IT & Database management	*	*	
Collections Management	*		
Museum Display/ exhibition	*		
Web site management	*	*	
Research & Publications	*	*	*
Education	*	*	
Archives and documentation	*	*	
Photography	*	*	
Graphics	*	*	
Conservation Management	*		
Cultural Heritage, policy and implementation	*		
Environmental	*	*	
Engineering		*	
Mapping and Survey	*	*	
Buildings structural and maintenance		*	
Architecture and design		*	
Visitor management	*	*	
Interpretation and display	*		
Health & safety		*	
Finance	*	*	
Human resources	*	*	
Project management	*	*	

Figure 5.13 shows the current agreed structure of the WHS Team, which is led by the Director of the Gibraltar Museum. This structure includes three new posts and four seconded posts approved by HMGoG as part of its commitment to the nomination process. Staff levels will be reviewed annually. Most of the roles will cross-utilise existing staff who will take on additional responsibilities. The total number of Gibraltar Museum staff with a direct role in the management of the site will initially be fifteen. The WH Team will be based within the Gibraltar Museum, with satellite bases in the new Interpretation Centre at Parson's Lodge and the Field Centre at the Moorish Castle.

Existing skills and expertise within the WHS Team itself include archaeology (marine and terrestrial), palaeontology, zoology, botany, geology, conservation management, policy development, education, interpretation, display, event organisation, project and operational management, human resources and finances.

There is an established and highly-qualified and experienced international team investigating the caves, including UK, Spanish and other international universities (Appendix 3), research institutions, museums, heritage organisations, archaeological specialists and technical advisers. Locally there is also substantive expertise in the Gibraltar Heritage Trust and the Gibraltar Ornithological and Natural History Society, the licenced guides and others. There is an extensive list of academic and other publications (see Bibliography).

Systems for property management, promotion and visitation are already in place through a number of Government Departments and non-governmental organisations. It includes the Gibraltar Tourist Board with a staff of 77 and a complement of 440 licenced guides. The Department of the Environment Team consists of 28 which include an Upper Rock Team, an Environmental monitoring section and Environmental Protection Officers. There is additional support from other Government Departments and expertise from NGOs (e.g. Gibraltar Ornithological and Natural History Society).

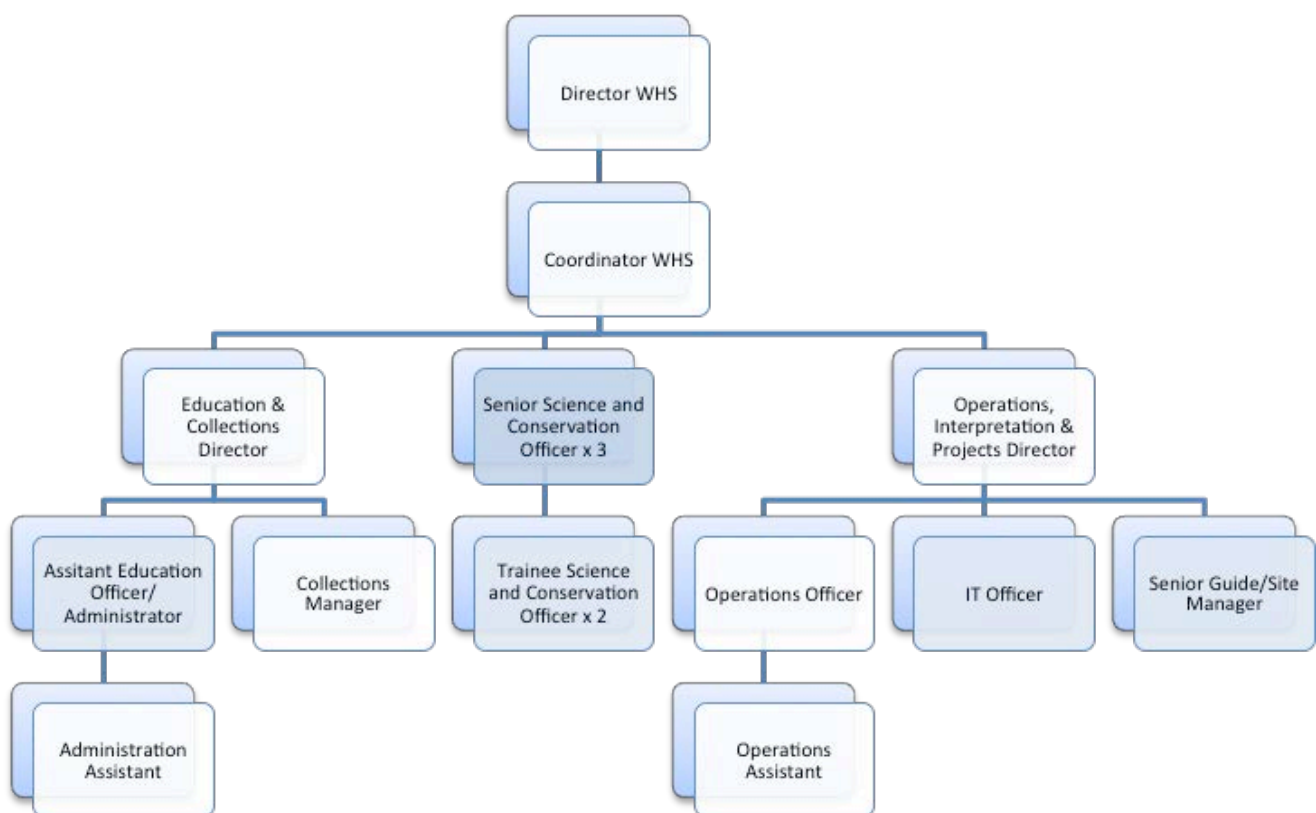


FIGURE 5.13 Current agreed structure for management of the nominated World Heritage Site. Posts shaded blue are new posts; white are existing posts.

6. Monitoring

The state of the property is excellent and is monitored today by Gibraltar Museum and other Government Departments. With effect from December 2014, with the appointment of new Gibraltar Museum staff, a regular programme of monitoring of the site and its attributes and facilities commenced. This programme supplements departmental monitoring programmes that exist within the Gibraltar Nature Reserve. With effect from November 2014 an annual Maintenance Work Plan will be drawn up by the Gibraltar Museum, in discussion with the Executive Management Group, for approval by the Steering Committee (in due course the Advisory Forum, Section 5.e.2). A research and conservation programme is being put in place following the first meeting of the standing International Research and Conservation Committee in September 2014 (see Volume 4).

These measures will formalise monitoring that already takes place today. This includes assessments of cave condition, including archaeological deposits, cliff stability and monitoring of living species within the property. Such surveys include bird migration counts which are carried out by the Gibraltar Ornithological and Natural History Society. The Gibraltar Museum monitors populations of species which roost or breed in the caves, in particular bats, Shags and Crag Martins. The Department of the Environment regularly monitors air and water quality. Surveys of persons transiting the public areas of the nominated property, with a view to establishing carrying capacity and the effects of visitor pressure, commenced in July 2014.

6.a Key Indicators for measuring state of conservation

Table 6.1 sets out the forty-three key indicators that will be used to monitor the state of the property. Fourteen are in place, the remaining will be put in place starting in January 2015 (Figure 6.1 and Figure 6.2). It is expected that all indicators will be used in monitoring the property one year ahead of inscription.



FIGURE 6.1 Forty-three key indicators that will be used to monitor the state of the property. Fourteen indicators are currently in place. The photograph shows bat monitoring which takes place on a monthly basis.

6.b Administrative Arrangements For Monitoring Property

The indicators will be monitored by the WHS Executive Management Group reporting to the Advisory Forum and Government who will take oversight of the Management Plan including all monitoring and indicators. The contact for the monitoring is the WHS Director, Gibraltar Museum, Bomb House Lane, Gibraltar.

6.c Results of previous reporting exercises

There has been no previous reporting exercise. The data on a number of measures are already collected by different agencies and will be collated during 2015.

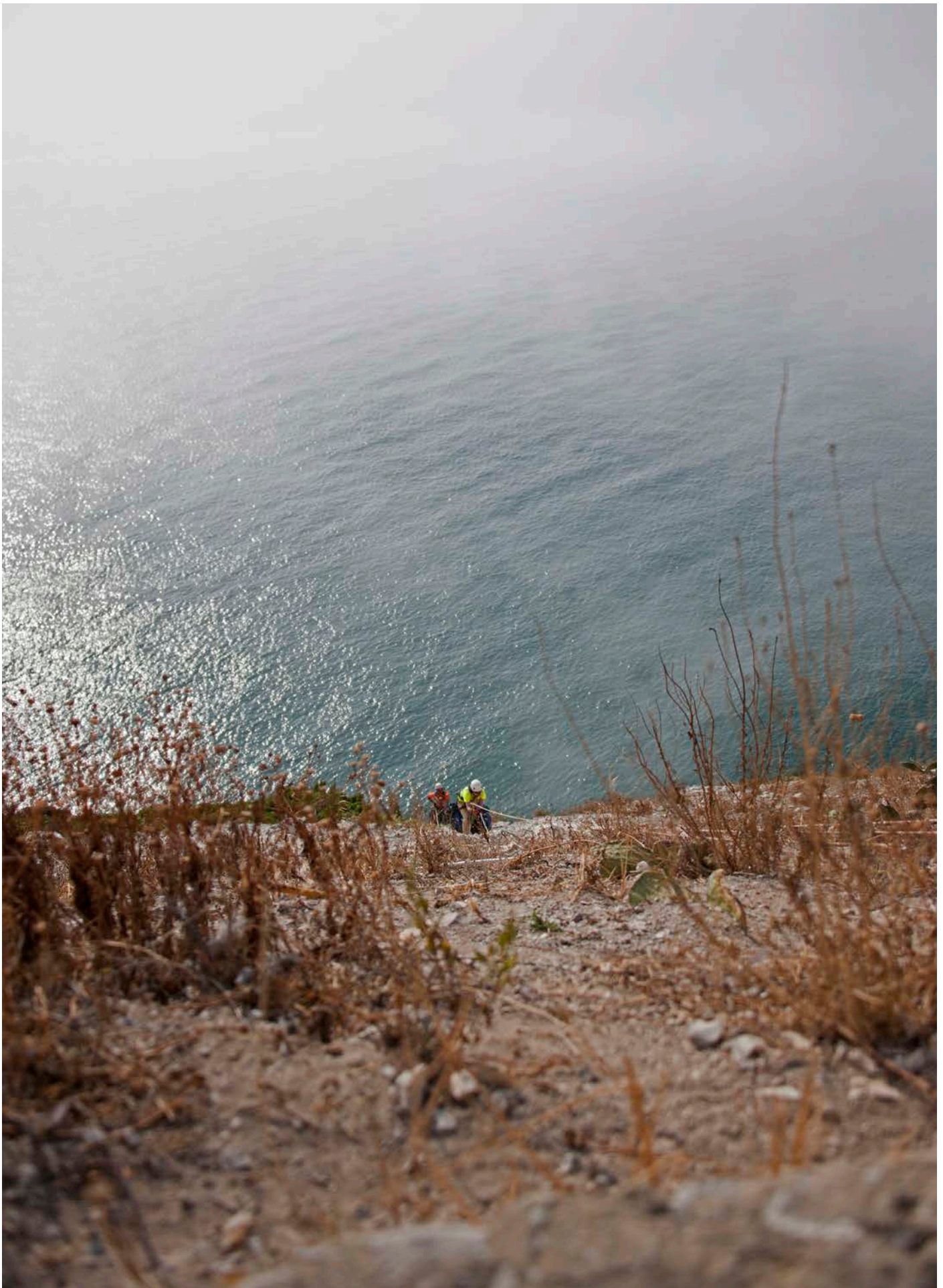


FIGURE 6.2 Monitoring the cliffs above Gorham's Cave for loose rocks, July 2014.

TABLE 6.1 Performance Indicators and Measures, by WHS Policy Objective (PO).

Indicators aimed at safeguarding the Site's Outstanding Universal Value (PO1)

Indicator	Measurement Method	Periodicity	Location
1 Heritage database and archive (including archaeological deposits)	Database and archive maintained by Museum, increasing public access, to include: <ul style="list-style-type: none"> • inspection of storage and condition of artefacts and specimens recovered (monthly) • Visual and photographic survey of deposits in caves (monthly) • Visual and photographic survey of archaeological deposits in caves during excavations (daily during excavations) 	Monthly Every 5 years, review	Gibraltar Museum
2 List and number of species, protected and not (flora, fauna and birds)	Ecological surveys listing and mapping priority species and habitats identified in the Nature Reserve Implementation Plan. Annual bird, reptile, faunal and floral surveys. To include: <ul style="list-style-type: none"> • Visual and photographic survey invasive plant species within property to measure success of removal • Visual and photographic survey plant repopulation project to measure success of new planting • Census breeding bird species within property (monthly March-May) • Bird migration counts (daily) • Census of wintering Crag Martin roost in Gorham's and Vanguard Caves (weekly October to March) • Census of bat populations in caves within property (monthly) • Survey of plants (annual) • Survey of invertebrate fauna (quarterly) • Survey of intertidal molluscs within the property (annual) • Monitoring of EU-protected species and habitats 	Annual surveys; full report every five years	Gibraltar Museum, Gibraltar Botanic Gardens, GONHS, Dept. of Environment
3 Map extent of protected habitats	Use digital mapping to keep up to date and review.	Annual surveys; full report every five years	Gibraltar Museum, Gibraltar Botanic Gardens, GONHS
4 Map extent of geological formations	Periodic surveys and publications.	Review every 5 years	Gibraltar Museum

5 List and number of features at risk within the WHS	<p>Condition survey of key attributes of Outstanding Universal Value including fixed-point photography and text report. Particular emphasis on caves with archaeological deposits at sea level and high level. To include:</p> <ul style="list-style-type: none"> • Photographic survey condition of cliffs and dunes and key attributes within property (annually) • Photographic Survey of general condition of area between key attributes (annually) • Weekly visual survey property boundary to ensure no encroachment • Annual photographic survey property boundary • Visual and photographic survey cave deposits to check for erosion and graffiti (monthly) • Visual and photographic survey of rock art to check for damage (annual) • Visual and photographic record of cave deposits during archaeological excavations • Visual and photographic survey of interpretation panels (biannually) • Visual inspection, measurement and photographic monitoring of lichen growth on rocks as indicator of air pollution (annually) • Development of indicator(s) for volume of deposits excavated during 5-year period <p>Report includes urgent and longer-term recommendations, and any improvements. Based on Museum Heritage Database, carried out by WHS Team assisted by volunteers from GHT and GONHS. Carried out in conjunction with measure 23 as far as practicable.</p>	<p>Annual survey and report; review trends every 5 years</p>	<p>Gibraltar Museum</p>
6 Quality of environment	<p>Annual photographic survey of setting and key features. Text report identifying landscape character, changes and enhancement with recommendations for the short, medium and long term. Also wider environmental reports including:</p> <ul style="list-style-type: none"> • Monitoring of air quality (monthly; by Environment Dept.) • Monitoring of water quality (weekly; by Environment Dept.) 	<p>Weekly, Monthly, Annual report, full assessment every 5 years</p>	<p>Gibraltar Museum</p>
7 List of major physical changes within the WHS & record of any loss, based on measures 2, 5 and 8	<p>Include in Annual Report on WHS.</p>	<p>Annual report</p>	<p>Gibraltar Museum</p>

8 List of Conservation Measures	Report by WHS Coordinator, summarising all actions (e.g. clearance debris, rehabilitation/ re-planting scheme, stabilisation measures, any grants schemes including value).	Annual report	Gibraltar Museum
9 Designations within WHS and buffer zone	Periodic review to include % of the WHS and buffer zone protected by designations, including Nature Reserve, Heritage Act, international designations, number scheduled monuments and number of listed buildings.	Review every 5 years	Gibraltar Museum
10 List of developments within the WHS or in the buffer zone affecting OUV, including setting	Monitor all planning applications, annual report Town Planner and Gibraltar Heritage Trust (GHT), coordinated by WHS Director. Although highly unlikely to occur, the WH Committee will be informed, through the Secretariat, of any proposed major restorations or new constructions which may affect OUV (Paragraph 172 notifications).	Annual report	Gibraltar Museum
11 Existence of WHS Policy and Planning Guidance in the Local Development Framework.	Presence/absence: Gibraltar Development Plan to include strategic principles, policies and design guide. Development Plan adopted as legal instrument. Planning guidance for development affecting the WHS or its setting within Gibraltar Development Plan. Although highly unlikely to occur, the WH Committee will be informed, through the Secretariat, of any proposed major restorations or new constructions which may affect OUV (Paragraph 172 notifications).	Review every 5 years	Gibraltar Museum
Indicators aimed at monitoring the fostering of the gathering and dissemination of scientific information about the Site (PO2).			
12 Research strategy	Research strategy in place, monitored by International Research and Conservation Committee at its annual meeting. Particular attention to balancing conservation needs with research objectives.	Annually or as needed	Gibraltar Museum
13 Fieldwork and surveys	Fieldwork and surveys guided by research strategy, and each has specific research questions. Annual review of all fieldwork to ensure sound balance between investigation and research outcomes, research projects, surveys and publications highlighting any new information about the World Heritage Site.	Annually	Gibraltar Museum
14 Partnership working	Assessment and monitoring of team composition to ensure sound mix and appropriate skills and experience.	Annually	Gibraltar Museum
15 Publication Records	List of all academic publications by year.	Every five years	Gibraltar Museum

Indicators aimed at monitoring the promotion of awareness and understanding of the Site's OUV (PO3).			
16 Provision for outreach, access and interpretation	Baseline annual summary of provision for interpretation and access, including provision for visitors with disabilities, virtual access, children, and foreign visitors. Annual review to identify changes and improvements (new view points, new information boards, new website, new discoveries etc.).	Annual report	Gibraltar Museum
17 Quality of interpretation about the values of the WHS and UNESCO aspirations	Annual visitor surveys to assess on-site interpretation on WH and UNESCO. Including ease of access and location, quality of information, standard of presentation. Peer review to assess on-site and off-site interpretation explaining the values of the WHS, based on standard checklist (use of WHS plaque, WHS road and gateway signs, information at airport, website, Museum, Castle Field Centre, Parson's Lodge, tourist offices, key visitation points such as Jews' Gate, Europa Point, popular and academic publications.	Annually Every 5 years	Gibraltar Museum
18 Number of hits on web site and visitors/ members of social media pages	Monitor through standard packages.	Annual report	Gibraltar Museum
19 Media coverage	Number of popular articles, newspaper articles, TV documentaries and radio programmes on the WHS.	Annual report	Gibraltar Museum
Indicators aimed at monitoring the entry of local people and visitors to the Site at levels which it can sustain (PO4).			
20 Number of visitors to the WHS	Ticket count for paying sites at key locations of Jews' Gate, Museum and Parson's Lodge, complemented by visitor surveys and questionnaires. Use of people counters will be explored. Five yearly review of statistics and comparison with other WHS.	Annual report, with review and assessment every 5 years	Gibraltar Museum and Gibraltar Tourist Board
21 Profile of visitors	Visitor surveys (on-going), covering % of local visitors, education visitors, % of foreign visitors with nationality split, % of groups, % of repeat visitors, age split and social diversity.	Annual report, with review and assessment every 5 years	Gibraltar Museum and Gibraltar Tourist Board
22 Level of satisfaction	Visitor surveys and questionnaire rating their visit (1= very poor, 2= poor, 3= satisfactory, 4= good, 5= very good).	Annual report, with review and assessment every 5 years	Gibraltar Museum and Gibraltar Tourist Board

23 Physical impact of visitors	List of negative physical impacts and remedial measures recommended (e.g. erosion of Mediterranean Steps and Upper Rock paths and roads, impacts on plant life). Weekly inspection for litter; Quarterly monitoring by visual inspection and fixed-point photographic survey. WHS Team and Volunteers	Annual Report; full assessment report every 5 years	Gibraltar Museum
24 Site visits to sea caves	Number of visits and visitors per visit. Gorham's Cave Complex can only be visited by prior arrangement and in limited numbers, with authority from the WHS Director. Records of visits are kept by the Museum. Most visits are by sea; land access is restricted.	Variable, but at least 20 per year	Gibraltar Museum
25 Guided visits to Upper Rock sites, including Mediterranean Steps	Numbers of tours, numbers in tour parties and profiles. Records of all parties visiting are kept; risk assessments are undertaken, and briefings for staff and students and visitors.	Annual report; full report every 5 years	Gibraltar Museum
26 No reportable accidents or incidents	Risk assessments and safety briefings are made, including fitness levels; records of parties and individuals kept.		Gibraltar Museum
Indicators to monitor the provision of a high quality range of educational information and services about the Site (PO5).			
27 Educational resources and activities, including outreach and publications	Availability and quality of resources: feedback from teachers and consumers through customer questionnaires. There is a range of educational resources and activities available, run from the Museum. These include teachers' packs, website, an education officer, activities on site, in the Museum, in schools, etc.). Activities are guided by input from teaching staff on suitability to key stage curricula.	Annual review	Gibraltar Museum
28 Conferences and Lectures	The Calpe Conference. WHS and Museum Staff regularly give local and international lectures on the WHS, human evolution and associated subjects. Records of lectures and talks are kept by the Museum and reported annually.	Major conference every 3 years; annual summary of activities; review every 5 years	Gibraltar Museum
Indicators to monitor that World Heritage Site status assists wider sustainable development objectives within Gibraltar (PO6).			
29 Economic and social impact of WHS status	Assessment is based on economic surveys, resident surveys, focus groups, and HMGoG covering any relevant issues. These include the impact of tourism, quality of life, funding received, buildings re-use, skills, business and residential property value, number of new businesses, etc.	Every 5 years	HMGoG Office of Statistics and Gibraltar Museum

30 Visitor spending	HMGoG provides annual visitor expenditure estimates, which are published on the HMGoG web site. This includes the average spend by nationals, the number of day trips, and average spend by foreign visitors and the number of overnight stays. Future surveys will include as assessment of the impact of WHS.	Annual	HMGoG Office of Statistics
31 Number of jobs generated and sustained	Regular monitoring of the number of staff directly employed by the WHS and other indirectly-employed staff.	Annual	HMGoG Office of Statistics and Gibraltar Museum
32 Environmental policy	There is an HMGoG policy to improve the environment generally and 'green' Gibraltar. The policy includes targets for reducing carbon footprint, energy and water consumption, reducing and recycling waste and improving waste management facilities, environmental guidelines for new buildings and visitor facilities. The policy is monitored by the Department of the Environment.	Annual	Department of the Environment
33 Percentage of visitors arriving or travelling within the WHS by different means	Visitor survey and monitoring is undertaken at key points including Jews' Gate. Travel within the WHS has to be largely on foot.	Annual	HMGoG Office of Statistics, Gibraltar Tourist Board and Gibraltar Museum
Indicators to monitor the promotion and support of the aspirations of UNESCO in sustainable development, inter-cultural dialogue and the relief of poverty (PO7).			
34 Capacity-building	Number of capacity-building and training activities, numbers students, trainees and volunteers attending. Number of links with other WHS in developing countries; number activities and numbers attending. Number of capacity-building and training courses for rehabilitation and recovery.	Annual report; review every 5 years	Gibraltar Museum
35 Partnership working	Composition of archaeological, science and conservation teams; type and number of publications with multi-national or multi-organisational authors; number local community groups and businesses participating in delivery of Management Plan objectives.	Annual report; review every 5 years	Gibraltar Museum
36 Raised awareness of UNESCO aspirations and functions	Regular surveys of levels of awareness in local population and among visitors; surveys school activities; promotion of World Heritage Convention in particular and World Heritage Sites; participation in World Heritage Youth Forum; celebration WH Day and other UNESCO events.	Annual report; review every 5 years	Gibraltar Museum

Indicators to monitor making the site an exemplary model for World Heritage Site Management (PO8).

37 Training	Number of courses and numbers attending; attendee feedback	Annual report; review every 5 years	Gibraltar Museum
38 Government commitment through funding	Level of funding maintained or enhanced annually	Annual review	Gibraltar Museum
39 Community involvement	Numbers of local people and businesses participating in protection measures, interpretation and visitation activities, responding to consultations; numbers visiting WHS; increased awareness values of WHS.	Annual report; review every 5 years	Gibraltar Museum
40 Existence of WHS Management Plan	Management Plan for 2014-2019 in place	Review every 5 years	Gibraltar Museum
41 Steering Group	Advisory Forum with representatives all stakeholders in place; chaired by Deputy Chief Minister	Meets annually; review every 5 years	Gibraltar Museum
42 WHS Director & Coordinator and WHS Team	WHS Team of 15.	Review annually	Gibraltar Museum
43 Risk assessment and emergency plans	Risk assessments for all activities, emergency plans in place for natural and man-made disasters. Efficacy of emergency procedures tested annually.	Review annually	Gibraltar Museum

7. Documentation

7.a Photographs and audiovisual image inventory and authorization form

Id. No	Format	Caption	Date of Photo	Photographer	Contact details of copyright owner	Non exclusive cession of rights
Photo 1	Digital photo	View of the nominated property and buffer zone from the south-east. The sea in the foreground is the Mediterranean.	June 2007	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 2	Digital photo	View of the nominated property from the south-east showing part of the series of caves at sea level. These caves were occupied by Neanderthals for 100,000 years. The sea enters some of these. In the background is the Catalan Bay Sand Dune, within the buffer zone, and a relic of dune activity when sea levels were lower than today. On the left, the highest peak of the Rock, within the nominated property, rises to 426 metres.	May 2014	Stewart Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes

Photo 3	Digital photo	View of the property and buffer zone from the Mediterranean, looking west. The caves, including Gorham's and Vanguard Caves, are clearly visible on the left. The seabird activity in the foreground reflects ecological patterns that have persisted through time since the time of the Neanderthals.	Sept. 2014	Geraldine Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 4	Digital photo	Close-up view of the property from the sea with Gorham's Cave in the foreground and Vanguard and Hyaena caves behind. Caves with the sea now entering them are on the right. The succession of cliffs and slopes to the peak reflect important tectonic uplift episodes.	Aug. 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 5	Digital photo	Close-up view of the property from the sea with Gorham's Cave in the foreground and Vanguard and Hyaena caves behind. Caves with the sea now entering them are on the right. The succession of cliffs and slopes to the peak reflect important tectonic uplift episodes.	July 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 6	Digital photo	Medium distance view of the property from the sea with Gorham's Cave in the foreground and Vanguard and Hyaena caves behind. Caves with the sea now entering them are on the right. The succession of cliffs and slopes to the peak reflect important tectonic uplift episodes.	July 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 7	Digital photo	View of the four main caves constituting the Gorham's Cave Complex from the sea. Left to right: Bennett's, Gorham's, Vanguard, Hyaena.	July 2006	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes

Photo 8	Digital photo	Gorham's Cave has a record of human occupation which includes a long Neanderthal sequence and the subsequent presence of modern humans. The cave was discovered in 1907 by Captain Gorham and has been the subject of archaeological research since 1989.	July 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 9	Digital photo	View of Gorham's Cave from the beach looking south. In the background are the 19th Century Europa Advance Batteries, now viewing platforms for the nominated property.	Aug. 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 10	Digital photo	View of the entrance of the cathedral-like Gorham's Cave looking north from a viewpoint within the nominated property.	June 2007	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 11	Digital photo	Classic view looking out from Gorham's Cave with the Mediterranean Sea as backdrop. At the time of the Neanderthals sea levels were lower and the sea was 4.5 kilometres away, exposing a sandy continental shelf.	Aug. 2005	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 12	Digital photo	Excavations in progress in the back chamber at Gorham's Cave.	July 2013	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 13	Digital photo	View of the beach by Gorham's Cave looking down from the access steps. The people on the beach offer an indication of the massive scale of the site. The exposed beaches include remnants of old beaches when sea levels were higher than now.	July 2013	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes

Photo 14	Digital photo	The Gorham's Cave Complex and the cliffs of the nominated property rising to its highest peak at 426 metres. The view is taken from the 3rd Europa Advance Battery, to become a viewing platform for visitors to the site.	April 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 15	Digital photo	Early morning view of the cliffs of the nominated property from the south-west, rising to the highest peak at 426 metres.	July 2014	Clive Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	Yes
Photo 16	Digital photo	The peak of the Rock, within the nominated property, looking south towards Africa. In the background, beyond the Strait of Gibraltar, lies Jebel Musa on the North African coast. The Rock and Jebel Musa constituted the Pillars of Hercules in ancient times. The vegetation on the slopes of the Rock, within the buffer zone, includes many species known to have been present at the time of the Neanderthals.	June 2014	Stewart Finlayson, Gibraltar Museum	Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar T: +350 200 74289 F: +350 200 79158 E: clive.finlayson@gibmuseum.gi	

7.b Texts relating to protective designation, copies of property management plans or documented management systems and extracts of other plans relevant to the property

Texts are appended as a separate document: Volume 2. The nominated property's Management Plan is Volume 3; and the draft Research and Conservation Strategy is Volume 4.

7.c Form and date of most recent records or inventory of property

A full inventory of heritage assets in Gibraltar, including the property was carried out in 1999. A revised inventory was undertaken in 2014. A programme of biological monitoring will commence in 2015. A monthly photographic survey commenced December 2014; records are held in a digital database.

Detailed archaeological records are kept for all investigations, including finds' registers, stratigraphic data, graphics and related materials. Records are in digital and paper formats.

7.d Address where inventory, records and archives are held

The Gibraltar Museum
18-20, Bomb House Lane
Gibraltar

7.e Bibliography

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8. Contact information of responsible authorities

8.a Preparer

Name: Professor Clive Finlayson DPhil MBE

Title: Director, Gibraltar Museum

Address: Gibraltar Museum,
18-20 Bomb House Lane
Gibraltar

Tel: +350 200 74289

Fax: +350 200 79158

E-mail: clive.finlayson@gibmuseum.gi

8.b Official local institution/agency

Gibraltar Museum

8.c Other local institutions

Gibraltar Museum

Department of the Environment

Gibraltar Ornithological and Natural History Society

Gibraltar Heritage Trust

Gibraltar Tourist Board

8.d Official web address

<http://www.gibmuseum.gi>

Contact name: Mr Stewart Finlayson

E-mail: stewart.finlayson@gibmuseum.gi

9. Signature on behalf of the state party

Lise-Anne Boissiere

Head of Tourism and Heritage
Department for Culture Media and Sport
100 Parliament Street
London SW1A 2BQ

20th January 2015

Appendix 1

Taxa of plants, inter-tidal molluscs and vertebrates identified from Palaeolithic levels in the caves within the candidate World Heritage Site.

Plant taxa n=79; Mollusca n=47; Amphibia n=12; Reptilia n=20, Aves n=150; Mammalia n=37. The number of bird taxa is the highest for any Middle/Upper Palaeolithic site in the world. Bird taxa breakdown by caves: Gorham's Cave n=141; Vanguard Cave n=73; Gorham's + Vanguard Cave n=148; Ibex Cave n=23; Sewell's Cave n=12

Note: in the case of birds *** indicates breeding species, ** regular migratory species, * occasional migratory species

Species	Gorham's	Vanguard	Ibex	Sewell's	Taxa present today
Plantae					
Abies sp	*				
Acer sp	*				
Alnus glutinosa	*				
Betula sp	*				
Corylus avellana	*				
Cistaceae sp	*				*
Fraxinus angustifolia	*				
Ilex aquifolium	*				
Castanea sp	*				
Ulmus sp	*				
Juglans regia	*				
Juniperus sp	*				
Taxus sp	*				
Fabaceae sp	*				*
Lonicera sp	*				*
Smilax sp	*				*
Olea europaea	*				*
Pinus nigra/sylvestris	*				
Pinus pinea	*				
Pinus pinaster	*				
Cedrus sp	*				
Pistacia lentiscus	*				*
Buxus sp	*				
Prunus sp	*				
Myrtus sp	*				
Maytenus sp	*				
Calicotome sp	*				*
Bupleurum sp	*				*

Tamarix sp	*				
Quercus suber	*				
Deciduous Quercus sp	*				
Evergreen Quercus sp	*				
Frangula sp	*				
Salix sp	*				
Arbutus unedo	*				
Rhamnus lycioides sp	*				*
Rhamnus alaternus	*				*
Phillyrea sp	*				
Rosaceae sp	*				*
Cistus/Halimium sp	*				*
Genisteae sp	*				*
Astragalus sp	*				*
Ephedra distachya	*				
Ephedra fragilis	*				*
Erica sp	*				
Calluna sp	*				
Hedera helix	*				
Helianthemum sp	*				*
Lamiaceae sp	*				*
Thymelaeaceae sp	*				
Viburnum sp	*				
Poacea sp	*				
Artemisia sp	*				
Asphodelus sp	*				*
Asteraceae sp	*				*
Chenopodiaceae sp	*				*
Centaurea sp	*				*
Caryophyllaceae sp	*				*
Plantago sp	*				*
Lotus sp	*				*
Rumex sp	*				*
Brassicaceae sp	*				*
Liliaceae sp	*				*
Rubiaceae sp	*				*
Boraginaceae sp	*				*
Anchusa sp	*				
Plumbaginaceae sp	*				*
Valerianaceae sp	*				*
Sanguisorba sp	*				
Malvaceae sp	*				*
Dipsacaceae sp	*				*
Urticaceae sp	*				*
Apiaceae sp	*				*
Thalictrum sp	*				

Ruta sp	*				*
Polygala sp	*				
Ranunculaceae sp	*				*
Pteridophyta sp	*				
Zygnemataceae sp	*				
Mollusca (inter-tidal)					
Acanthocardia tuberculata	*	*			*
Anomia sp	*				*
Antalis sp	*				*
Bolinus brandaris	*				*
Callista chione	*	*			*
Cardita calyculata	*				*
Chamelea sp	*				*
Charonia nodifera	*				
Cypraea spurca	*				
Fissurella sp	*				*
Gibbula sp	*				*
Glycimeris bimaculata	*				*
Laevicardium crissum	*				*
Littorina obtusata	*				
Littorina saxatilis	*				*
Lucina borealis	*				
Modiolus modiolus	*				
Osilinus turbinatus	*				
Osilinus articulatus	*				
Muricidae sp	*				*
Mytilus galloprovincialis	*	*			*
Mytilus edulis	*				*
Nassarius reticulatus	*				*
Nucella lapillus	*				
Patella caerulea	*	*			*
Patella depressa	*				*
Patella ferruginea	*				*
Patella ulissiponensis	*				*
Patella vulgata	*	*			*
Pecten jacobaeus	*				*
Pecten maximus	*				*
Phorcus sp	*				*
Semicassis undulata	*				
Siphonaria pectinata	*				*
Stramonita haemastoma	*				*
Trivia monacha	*				
Venerupis decussata	*				
Mollusca (terrestrial)					
Truncatellina cylindrica		*			*
Rumina decollata	*	*			*

<i>Caracolina lenticula</i>	*	*			*
<i>Xerotrichia conspurcata</i>	*				*
<i>Candidula</i> sp	*				?
<i>Cerneuella</i> sp	*				?
<i>Theba pisana</i>	*				*
<i>Pseudotachea</i> sp		*			?
<i>Otala lactea</i>	*	*			*
<i>Iberus marmoratus</i>	*	*			*
Amphibia					
<i>Pleurodeles waltl</i>	*				
<i>Triturus marmoratus</i>	*				
<i>Triturus pygmaeus</i>	*	*			
<i>Lissotriton</i> sp	*				
<i>Discoglossus</i> sp	*				
<i>Alytes</i> sp	*				
<i>Pelobates cultripres</i>	*	*			
<i>Bufo spinosus</i>	*	*			
<i>Epidalea calamita</i>	*				
<i>Hyla meridionalis</i>	*	*			
<i>Rana</i> sp	*	*			
<i>Pelophylax perezi</i>	*				
Reptilia					
<i>Eurotestudo hermanni</i>	*	*			
<i>Mauremys caspica</i>		*			
<i>Tarentola mauretana</i>	*	*			*
<i>Psammodromus algirus</i>	*	*			*
<i>Acanthodactylus erythrurus</i>	*	*			
<i>Timon lepidus</i>	*	*			*
<i>Lacerta schreiberi</i>	*				
<i>Podarcis hispanica</i>	*				*
<i>Chalcides bedriagae</i>	*	*			*
<i>Chalcides striatus</i>	*				*
<i>Malpolon monspessulanus</i>	*				*
<i>Hemmorhois hippocrepis</i>	*				*
<i>Rhinechis scalaris</i>	*				*
<i>Natrix natrix</i>	*	*			*
<i>Natrix maura</i>	*	*			
<i>Coronella girondica</i>	*	*			*
<i>Macroprotodon brevis</i>	*				*
<i>Telescopus</i> sp	*				
<i>Vipera berus/seoani</i>	*				
<i>Vipera latasti</i>	*				
Aves					
<i>Gavia stellata</i>	*			*	*
<i>Podiceps auritus</i>	*				
<i>Fulmarus glacialis</i>	*	*			

Pterodroma sp	*	*	*		
Calonectris diomedea/borealis	*				**
Puffinus puffinus	*				
Puffinus mauretanicus	*	*			**
Hydrobates pelagicus	*				**
Phalacrocorax carbo	*				**
Phalacrocorax aristotelis	*	*			***
Morus bassanus	*		*	*	**
Ardea purpurea	*				*
Plegadis falcinellus	*				
Geronticus eremita	*				
Ciconia ciconia	*				**
Branta bernicla	*	*	*		
Tadorna sp	*	*			*
Netta rufina	*				
Marmaronetta angustirostris	*				
Anas platyrhynchos	*				*
Anas crecca/querquedula	*				
Anas strepera/acuta	*				
Aythya ferina	*				
Aythya fuligula	*				
Clangula hyemalis	*	*			
Melanitta nigra	*	*			**
Melanitta fusca	*				
Mergus serrator	*				*
Milvus milvus	*	*			*
Milvus migrans	*				**
Haliaeetus albicilla	*	*			
Neophron percnopterus	*	*			**
Gypaetus barbatus	*		*		
Aegypius monachus	*				*
Gyps fulvus	*	*		*	**
Accipiter gentilis	*	*			*
Accipiter nisus	*	*			**
Buteo buteo	*	*	*		**
Buteo lagopus	*				
Aquila fasciata	*	*			*
Aquila chrysaetos	*		*		*
Circus cyaneus	*	*			**
Falco naumanni	*	*	*		**
Falco tinnunculus	*	*	*	*	**
Falco subbuteo	*	*			**
Falco peregrinus	*		*		***/**
Francolinus francolinus				*	
Alectoris rufa	*	*	*		
Coturnix coturnix	*	*			**

Rallus aquaticus	*				
Porzana porzana	*	*			
Fulica atra	*				
Glareola pratincola	*				
Otis tarda	*				
Tetrax tetrax	*				
Haematopus ostralegus	*				**
Himantopus himantopus	*				*
Burhinus oedicephalus	*				*
Vanellus vanellus	*				**
Pluvialis squatarola	*				*
Charadrius hiaticula	*	*			*
Gallinago sp		*			
Scolopax rusticola	*	*			*
Limosa limosa	*	*			*
Numenius phaeopus	*	*			**
Numenius arquata	*				*
Tringa totanus	*	*			*
Calidris canutus	*	*			
Calidris maritima	*				**
Calidris alpina	*	*			*
Phalaropus fulicaria	*	*			
Larus marinus	*				
Larus argentatus complex	*	*			***
Larus ridibundus	*	*			**
Rissa tridactyla	*	*			**
Stercorarius parasiticus	*				**
Catharacta skua	*				**
Sterna sp	*				**
Chlidonias niger	*				**
Pinguinus impennis	*		*		
Uria aalge		*			*
Alca torda	*	*			**
Alle alle	*				*
Fratercula arctica	*	*			**
Columba livia	*	*	*	*	**
Columba oenas	*	*	*		*
Columba palumbus	*	*	*		*
Sterptopelia turtur	*	*			**
Tyto alba	*				*
Otus scops	*	*			**
Bubo bubo	*	*	*		***
Bubo scandiacus	*				
Strix aluco	*	*			***
Asio flammeus	*				*
Athene noctua	*	*			***

Caprimulgus ruficollis	*				**
Apus apus/pallidus	*	*			***/**
Tachymarptis melba	*	*	*		***/**
Coracias garrulus		*			*
Upupa epops	*				**
Picus viridis	*				
Dendrocopus major	*				
Melanocorypha calandra	*	*			
Calandrella sp		*			*
Galerida cristata	*				**
Lullula arborea	*	*			*
Alauda arvensis	*	*			**
Hirundo rustica	*	*			**
Ptyonoprogne rupestris	*	*			**
Delichon urbica	*				**
Motacilla alba	*				**
Motacilla flava	*				**
Anthus pratensis	*	*			**
Anthus campestris	*				**
Anthus spinoletta	*	*			*
Prunella modularis	*		*		**
Prunella collaris	*		*		**
Sylvia atricapilla/hortensis/communis	*				**
Sylvia melanocephala/curruca		*			**
Ficedula hypoleuca	*				**
Erithacus rubecula	*	*			**
Phoenicurus ochruros	*	*			**
Oenanthe oenanthe	*				**
Oenanthe hispanica	*				**
Oenanthe leucura	*				
Monticola solitarius	*	*	*		***/**
Turdus merula	*	*	*	*	***/**
Turdus viscivorus				*	*
Lanius excubitor/minor	*	*			*
Parus major	*				***/**
Certhia sp	*				*
Cyanopica cyanus	*	*			
Pica pica	*	*		*	*
Pyrrhocorax graculus	*	*			*
Pyrrhocorax pyrrhocorax	*	*	*	*	*
Corvus monedula	*	*			*
Corvus corone	*		*	*	*
Corvus corax	*	*	*	*	**
Sturnus sp	*	*			**
Petronia petronia	*	*			
Fringilla coelebs	*	*			**

Coccythraustes coccythraustes		*			*
Carduelis carduelis/cannabina	*				**
Carduelis flammea	*				
Carduelis chloris	*				**
Pyrrhula pyrrhula	*				*
Passer sp	*				**
Emberiza hortulana	*				**
Emberiza citrinella	*				
Emberiza calandra	*				**
Mammalia					
Oryctolagus cuniculus	*				*
Lepus sp	*				
Apodemus sylvaticus	*				
Eliomys quercinus	*				
Microtus brecciensis	*				
Terricola duodecimcostatus	*				
Iberomys cabrerae	*				
Arvicola sapidus	*				
Talpa occidentalis	*				
Crocidura russula	*				*
Sorex minutus	*				
Sorex coronatus araneus	*				
Erinaceus europaeus	*				
Myotis myotis	*				*
Myotis nattereri	*				
Miniopterus schreibersii	*				*
Homo sapiens	*				*
Delphinus delphis		*			*
Tursiops truncatus		*			*
Cetacea sp	*				*
Canis lupus	*	*			
Vulpes vulpes	*				
Felis sylvestris	*	*			
Lynx pardina	*	*			
Panthera pardus	*	*			
Panthera leo	*				
Ursus arctos	*	*			
Crocuta crocuta	*	*			
Monachus monachus	*	*			
Halichoerus grypus	*				
Equus ferus	*				
Dicerorhinus hemitoechus	*				
Sus scrofa	*	*			
Cervus elaphus	*	*			
Megaloceros sp	*				
Bos primigenius	*				

Appendix 2

Insect taxa present in Gibraltar for which there is circumstantial evidence of their presence in the Gibraltar Neanderthal landscape

Listed in this appendix are insect (mainly beetle) species that are expected to have been found within the nominated property during the Pleistocene, given the species of plant and animals present, as well as habitats. These species are present on site today. These lists are not exhaustive and further work can be carried out.

(a) Associated with Plant Genera Present in the Fossil Record

The table below lists species of insect associated with plant species and genera that are present in the fossil record. All of these insects are currently found in Gibraltar and have been recorded in association with the food plants that are listed. In some cases, insects have very strict requirements and rely only on a single food plant or a small range of plant species. In such cases, the food plant has been indicated and it has been highlighted that only the food plant's genus has been recorded. However, in other instances, associations with single species may be incidental, due purely to there only being one member of a plant genus present in Gibraltar (e.g. Calicotome).

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Anobiidae (wood borer beetles)	Metholcus phoenicis	Prunus spp.	Larvae feed within wood
Coleoptera (beetles)	Brentidae (weevils)	Apion haematodes	Rumex bucephalorus	Adults feed on leaves. Rumex sp. recorded in the fossil record
Coleoptera (beetles)	Brentidae (weevils)	Isochnopterapion aeneomicans	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Brentidae (weevils)	Isochnopterapion modestum	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Brentidae (weevils)	Isochnopterapion plumbeomicans	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Brentidae (weevils)	Onychapion poupillieri	Tamarix spp.	Adults feed on leaves
Coleoptera (beetles)	Brentidae (weevils)	Oryxolaemus scabiosus	Calicotome villosa	Adults feed on leaves
Coleoptera (beetles)	Brentidae (weevils)	Perapion violaceum	Rumex spp.	Adults feed on leaves
Coleoptera (beetles)	Brentidae (weevils)	Protopirapion atratum	Calicotome villosa	Adults feed on leaves. Calicotome sp. recorded in the fossil record

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Buprestidae (jewel beetles)	Anthaxia dimidiata	Olea europaea	Larvae & adults feed on leaves
Coleoptera (beetles)	Buprestidae (jewel beetles)	Anthaxia funerula	Calicotome villosa	Larvae feed within wood. Calicotome sp. recorded in the fossil record
Coleoptera (beetles)	Buprestidae (jewel beetles)	Anthaxia scutellaris	Pinus spp., Pistacia spp.	Larvae feed within wood
Coleoptera (beetles)	Buprestidae (jewel beetles)	Buprestis octoguttata	Pinus spp.	Larvae feed within wood
Coleoptera (beetles)	Buprestidae (jewel beetles)	Buprestis sanguinea ssp. calpetana	Ephedra fragilis	Endemic to Gibraltar. Larvae feed within wood
Coleoptera (beetles)	Buprestidae (jewel beetles)	Sphenoptera barbarica	Lotus spp.	Larvae feed on roots
Coleoptera (beetles)	Buprestidae (jewel beetles)	Sphenoptera gemmata	Lotus spp.	Larvae feed on roots
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Arhopalus ferus	Pinus spp.	Larvae feed within wood
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Deroplia troberti	Pistacia lentiscus	Larvae feed within wood
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Gracilia minuta	Prunus spp.	Larvae feed within wood
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Niphona picticornis	Pistacia lentiscus	Larvae feed within wood
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Penichroa fasciata	Pistacia lentiscus	Larvae feed within wood
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Stenopterus ater	Pistacia lentiscus	Larvae feed within wood
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	Trichoferus fasciculatus	Pistacia lentiscus	Larvae feed within wood
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Bruchidius foveolatus	Calicotome villosa	Larvae feed on seeds. Calicotome sp. recorded in the fossil record
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Bruchidius meleagrinus	Lotus arenarius	Larvae feed on seeds. Lotus sp. recorded in the fossil record
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Bruchidius seminarius	Calicotome villosa	Larvae feed on seeds. Calicotome sp. recorded in the fossil record
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Bruchidius taorminensis	Calicotome villosa	Larvae feed on seeds. Calicotome sp. recorded in the fossil record
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cassida vittata	Rumex spp.	Larvae & adults feed on leaves

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Chrysolina banksi	Rumex spp.	Larvae & adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cryptocephalus jocularis	Pistacia lentiscus	Adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cryptocephalus luridicollis	Pistacia lentiscus	Adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cryptocephalus saucius	Pistacia lentiscus	Adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cryptocephalus tristigma	Pistacia spp., Rhamnus lycioides	Adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Lachnaia pubescens	Pistacia spp.	Adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Lachnaia vicina	Rumex spp.	Adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Macrolenes dentipes	Pistacia spp.	Only if ant host of larvae, Crematogaster scutellatis, is present
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Mantura chrysanthemii	Rumex bucephalorus	Larvae & adults feed on leaves. Rumex sp. recorded in the fossil record
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Sphaeroderma rubidum	Centaurea spp.	Larvae & adults feed on leaves
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Tituboea biguttata	Pistacia spp.	Only if ant host of larvae, Messor barbarus, is present
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Xanthogaleruca luteola	Ulmus minor	Larvae & adults feed on leaves. Ulmus sp. recorded in the fossil record
Coleoptera (beetles)	Coccinellidae (ladybirds)	Myrrha octodecimguttata	Pinus spp.	As predator of pine aphids
Coleoptera (beetles)	Curculionidae (weevils)	Brachytemnus porcatus	Pinus pinea	
Coleoptera (beetles)	Curculionidae (weevils)	Coniatus repandus	Tamarix spp.	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Donus austerus	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Donus chevrolati	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Donus fallax	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Geonemus flabellipes	Olea europaea	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Hypera postica	Rumex spp.	Adults feed on leaves

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Curculionidae (weevils)	Kyklioacalles bupleuri	Bupleurum fruticosum	Adults feed on leaves. Bupleurum sp. recorded in the fossil record
Coleoptera (beetles)	Curculionidae (weevils)	Paroxyonyx cinctus	Ephedra fragilis	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Phloeotribus scarabaeoides	Olea europaea	
Coleoptera (beetles)	Curculionidae (weevils)	Polydrusus korbi	Pistacia lentiscus	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Polydrusus pilosulus	Pistacia lentiscus	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Polydrusus xanthopus	Olea europaea	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Sitona discoideus	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Sitonia lineatus	Lotus spp.	Adults feed on leaves
Coleoptera (beetles)	Curculionidae (weevils)	Torneuma baeticum	Asphodelus spp., Olea europaea	Endogean. Larvae & adults feed on roots
Coleoptera (beetles)	Curculionidae (weevils)	Torneuma bensusani	Asphodelus spp., Olea europaea	Endogean. Larvae & adults feed on roots
Coleoptera (beetles)	Curculionidae (weevils)	Torneuma istanense	Asphodelus spp., Olea europaea	Endogean. Larvae & adults feed on roots
Coleoptera (beetles)	Curculionidae (weevils)	Triotemnus antoinei	Pistacia lentiscus	
Coleoptera (beetles)	Curculionidae (weevils)	Tychius capucinus	Lotus collinus	Adults feed on leaves. Lotus sp. recorded in the fossil record
Coleoptera (beetles)	Nanophyidae (weevils)	Corimalia pallida	Tamarix spp.	Adults feed on leaves
Coleoptera (beetles)	Nanophyidae (weevils)	Corimalia tamarisci	Tamarix spp.	Adults feed on leaves
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes immundus	Calicotome villosa	Larvae & adults feed on pollen. Calicotome sp. recorded in the fossil record
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes varicollis	Lotus collinus	Larvae & adults feed on pollen. Lotus sp. recorded in the fossil record
Coleoptera (beetles)	Rhynchitidae (weevils)	Lasiorhynchites coeruleocephalus	Pistacia lentiscus	Adults feed on leaves
Lepidoptera butterflies & moths)	Geometridae (geometer moths)	Abraxas pantaria	Fraxinus angustifolia	Larvae feed on leaves. Fraxinus sp. recorded in the fossil record

Order	Family	Taxon	Associated with	Ecology & Notes
Lepidoptera (butterflies & moths)	Lycaenidae (gossamer-winged butterflies)	Lycaena phlaeas	Rumex spp.	Larvae feed on leaves
Lepidoptera (butterflies & moths)	Lycaenidae (gossamer-winged butterflies)	Polyommatus icarus	Lotus spp.	Larvae feed on leaves
Lepidoptera (butterflies & moths)	Lycaenidae (gossamer-winged butterflies)	Satyrium spini	Rhamnus spp.	Larvae feed on leaves
Lepidoptera (butterflies & moths)	Lycaenidae (gossamer-winged butterflies)	Tomares ballus	Astragalus spp., Lotus spp.	Larvae feed on leaves
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Charaxes jасius	Arbutus unedo	Larvae feed on leaves
Lepidoptera (butterflies & moths)	Papilionidae (swallowtail butterflies)	Papilio machaon	Ruta angustifolia	Larvae feed on leaves. Ruta sp. recorded in the fossil record.
Lepidoptera (butterflies & moths)	Pieridae (white butterflies)	Gonepteryx cleopatra	Rhamnus spp.	Larvae feed on leaves
Lepidoptera (butterflies & moths)	Sphingidae (hawk moths)	Acherontia atropos	Olea europaea	Larvae feed on leaves

(b) Associated with plant subfamilies and families present in the fossil record

Some of the plants in the fossil record have only been recorded to the family or sub-family level. The table below lists insect species that may have been associated with these, either (1) because the plants with which they are associated belong to one or more of the families or sub-families recorded, or (2) these species are associated with a range of species within a family or sub-family of plant. When invertebrate species feed on a range of plant species, they are deemed to be polyphagous. These polyphagous species are more likely to have been present than those that have stricter requirements, as in many cases they may feed on many or all species within a plant family or families. In such cases, they have been marked as 'polyphagous' under 'Ecology & Notes'.

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Anthicidae (ant-like beetles)	Clavicomus bruckii	Phagnalon saxatile	Biology unknown but almost always on P. saxatile, which belongs to family Asteraceae. Only known from Gibraltar; possibly endemic
Coleoptera (beetles)	Brentidae (weevils)	Aspidapion aeneum	Lavatera cretica, Malva sylvestris	Adults feed on leaves. Host plants belong to family Malvaceae
Coleoptera (beetles)	Brentidae (weevils)	Aspidapion radiolus	Lavatera cretica, Malva sylvestris	Adults feed on leaves. Host plants belong to family Malvaceae
Coleoptera (beetles)	Brentidae (weevils)	Holotrichapion ononis	Ononis natrix	Adults feed on leaves. Host plants belong to family Fabaceae
Coleoptera (beetles)	Brentidae (weevils)	Lepidapion argentatum	Teline linifolia	Adults feed on leaves. Host plants belong to family Fabaceae
Coleoptera (beetles)	Brentidae (weevils)	Malvapion malvae	Lavatera cretica, Malva sylvestris	Adults feed on leaves. Host plants belong to family Malvaceae
Coleoptera (beetles)	Brentidae (weevils)	Protapion interjectum	Trifolium spp.	Adults feed on leaves. Host plants belong to family Fabaceae
Coleoptera (beetles)	Brentidae (weevils)	Protapion laevicolle	Trifolium spp.	Adults feed on leaves. Host plants belong to family Fabaceae
Coleoptera (beetles)	Brentidae (weevils)	Protapion nigritarse	Trifolium spp.	Adults feed on leaves. Host plants belong to family Fabaceae
Coleoptera (beetles)	Brentidae (weevils)	Protapion ononidis	Ononis natrix	Adults feed on leaves. Host plants belong to family Fabaceae
Coleoptera (beetles)	Brentidae (weevils)	Protapion trifolii	Trifolium spp.	Adults feed on leaves. Host plants belong to family Fabaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Brentidae (weevils)	<i>Pseudapion rufirostre</i>	<i>Lavatera cretica</i> , <i>Malva sylvestris</i>	Adults feed on leaves. Host plants belong to family Malvaceae
Coleoptera (beetles)	Brentidae (weevils)	<i>Taeniapion rufescens</i>	<i>Urtica dubia</i>	Adults feed on leaves. Host plants belong to family Urticaceae
Coleoptera (beetles)	Buprestidae (jewel beetles)	<i>Anthaxia anatolica</i> ssp. <i>ferulae</i>	<i>Ferula tingitana</i>	Larvae feed within stems. Host plant belongs to family Apiaceae
Coleoptera (beetles)	Buprestidae (jewel beetles)	<i>Anthaxia cyanescens</i> ssp. <i>bedeli</i>	<i>Foeniculum vulgare</i>	Larvae feed within stems. Host plant belongs to family Apiaceae
Coleoptera (beetles)	Buprestidae (jewel beetles)	<i>Melioboaeoides amethystinus</i>	<i>Carlina hispanica</i>	Larvae feed within stems. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Agapanthia annularis</i>	<i>Carduus</i> spp., <i>Galactites tomentosus</i>	Larvae feed within stems. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Agapanthia cardui</i>	<i>Carduus</i> spp., <i>Galactites tomentosus</i>	Larvae feed within stems. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Calamobius filum</i>	<i>Avena</i> spp.	Larvae feed within stems. Host plant belongs to family Poaceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Certallum ebulinum</i>	<i>Diploaxis siifolia</i> , <i>Hirschfeldia incana</i> , <i>Raphanus raphanistrum</i>	Larvae feed within stems. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Opsilia caerulescens</i>	<i>Echium</i> spp.	Larvae feed within stems. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Opsilia molybdaena</i>	<i>Echium</i> spp.	Larvae feed within stems. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Cerambycidae (longhorn beetles)	<i>Parmena pubescens</i>	<i>Ferula tingitana</i> , <i>Foeniculum vulgare</i> , <i>Thapsia villosa</i>	Larvae feed within stems. Host plants belong to family Apiaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Bruchidius biguttatus	Cistus salviifolius	Larvae feed on seeds. Host plant belongs to genus Cistus, family Cistaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Bruchus tristiculus	Hippocrepis multisiliquosa	Larvae feed on seeds. Host plant belongs to family Fabaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cassida vittata	Atriplex halimus, Beta vulgaris	Larvae & adults feed on leaves. Host plants belong to family Chenopodiaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Chrysolina americana	Lavandula spp., Rosmarinus officinalis	Larvae & adults feed on leaves. Host plants belong to family Lamiaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Chrysolina helopioides	Ferula tingitana	Larvae & adults feed on leaves. Host plant belongs to family Apiaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Crioceris macilenta	Asparagus albus, Asparagus aphyllus	Larvae & adults feed on leaves. Host plants belong to family Asparagaceae (formerly Liliaceae)
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Crioceris paracanthesis	Asparagus albus, Asparagus aphyllus	Larvae & adults feed on leaves. Host plants belong to family Asparagaceae (formerly Liliaceae)
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Cryptocephalus crassus	Carthamus arborescens	Adults feed on leaves. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Hispa atra	Poaceae	Larvae & adults feed on leaves. Polyphagous on Poaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Longitarsus aeneus	Echium spp.	Larvae & adults feed on leaves. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Longitarsus anacardius	Prasium majus	Larvae & adults feed on leaves. Host plant belongs to family Lamiaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Longitarsus cerinthes	Echium spp.	Larvae & adults feed on leaves. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Longitarsus dorsalis	Cineraria maritima	Larvae & adults feed on leaves. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Orestia punctipennis	Prasium majus	Larvae & adults feed on leaves. Host plant belongs to family Lamiaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Podagrica fuscicornis	Malva spp., Lavatera spp.	Larvae & adults feed on leaves. Host plants belong to family Malvaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Podagrica malvae	Malva spp., Lavatera spp.	Larvae & adults feed on leaves. Host plants belong to family Malvaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Psylliodes chrysocephalus	Diplotaxis siifolia, Hirschfeldia incana	Larvae & adults feed on leaves. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Psylliodes cupreus	Diplotaxis siifolia, Hirschfeldia incana	Larvae & adults feed on leaves. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Psylliodes marcidus	Cakile maritima	Larvae & adults feed on leaves. Host plant belongs to family Brassicaceae. Cakile maritima grows on beaches
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Psylliodes maroccanus	Diplotaxis siifolia, Hirschfeldia incana	Larvae & adults feed on leaves. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Psyllioides gougeleti	Diplotaxis siifolia	Larvae & adults feed on leaves. Host plant belongs to family Brassicaceae
Coleoptera (beetles)	Chrysomelidae (leaf beetles)	Timarcha parvicollis	Rubia peregrina	Larvae & adults feed on leaves. Host plant belongs to family Rubiaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Curculionidae (weevils)	Andrion regensteinense	Teline linifolia	Adults feed on leaves. Host plant belongs to family Fabaceae
Coleoptera (beetles)	Curculionidae (weevils)	Aulacobaris coerulescens	Diplotaxis siifolia, Hirschfeldia incana	Adults feed on leaves. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Curculionidae (weevils)	Ceutorhynchus assimilis	Lobularia maritima	Adults feed on leaves. Host plant belongs to family Brassicaceae
Coleoptera (beetles)	Curculionidae (weevils)	Ceutorhynchus pallidactylus	Diplotaxis siifolia, Hirschfeldia incana	Adults feed on leaves. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Curculionidae (weevils)	Charagmus cachectus	Ononis natrix	Adults feed on leaves. Host plant belongs to family Fabaceae
Coleoptera (beetles)	Curculionidae (weevils)	Ectamnogaster caviventris	Galactites tomentosus	Adults feed on leaves. Host plant belongs to family Brassicaceae
Coleoptera (beetles)	Curculionidae (weevils)	Euplister hybridus	Thapsia villosa	Adults feed on leaves. Host plant belongs to family Apiaceae
Coleoptera (beetles)	Curculionidae (weevils)	Hadroplontus trimaculatus	Carduus spp., Galactites tomentosus	Adults feed on leaves. Host plants belong to family Asteraceae
Coleoptera (beetles)	Curculionidae (weevils)	Hypera scolymi	Scolymus hispanicus	Adults feed on leaves. Host plant belongs to family Apiaceae
Coleoptera (beetles)	Curculionidae (weevils)	Larinus flavescens	Carlina hispanica	Adults feed on leaves. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Curculionidae (weevils)	Larinus ursus	Carlina hispanica	Adults feed on leaves. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Curculionidae (weevils)	Lixus angustatus	Malva spp., Lavatera spp.	Adults feed on leaves. Host plants belong to family Malvaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Curculionidae (weevils)	Lixus brevirostris	Beta vulgaris	Adults feed on leaves. Host plant belongs to family Chenopodiaceae
Coleoptera (beetles)	Curculionidae (weevils)	Lixus filiformis	Carduus spp., Galactites tomentosus	Adults feed on leaves. Host plants belongs to family Asteraceae
Coleoptera (beetles)	Curculionidae (weevils)	Lixus scolopax	Carthamus arbo- rescens	Adults feed on leaves. Host plant belongs to family Asteraceae
Coleoptera (beetles)	Curculionidae (weevils)	Lixus vilis	Malva sylvestris	Adults feed on leaves. Host plant belongs to family Malvaceae
Coleoptera (beetles)	Curculionidae (weevils)	Malvaevora timida	Malva sylvestris	Adults feed on leaves. Host plant belongs to family Malvaceae
Coleoptera (beetles)	Curculionidae (weevils)	Mecinus variabilis	Urtica dubia	Adults feed on leaves. Host plant belongs to family Urticaceae
Coleoptera (beetles)	Curculionidae (weevils)	Melaleucus picturatus	Diplotaxis siifolia, Hirschfeldia incana	Adults feed on leaves. Host plants belong to family Brassicaceae
Coleoptera (beetles)	Curculionidae (weevils)	Mogulones grisescens	Echium plantagineum	Adults feed on leaves. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Curculionidae (weevils)	Mogulones peregrinus	Borago officinalis	Adults feed on leaves. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Curculionidae (weevils)	Pachytychius squamosus	Succowia balearica	Adults feed on leaves. Host plant belongs to family Brassicaceae
Coleoptera (beetles)	Curculionidae (weevils)	Parthelcus pollinarius	Urtica dubia	Adults feed on leaves. Host plant belongs to family Urticaceae
Coleoptera (beetles)	Curculionidae (weevils)	Philopedon vicinum	Poaceae	Adults feed on leaves. Polyphagous on Poaceae. Prefers sandy substrates

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Curculionidae (weevils)	Rhinocyllus oblongus	Carduus spp., Galactites tomentosus	Adults feed on leaves. Host plants belongs to family Asteraceae
Coleoptera (beetles)	Curculionidae (weevils)	Sibinia planiuscula	Limonium spp.	Adults feed on leaves. Host plant belongs to family Plumbaginaceae
Coleoptera (beetles)	Curculionidae (weevils)	Thamiocolus niveus	Prasium majus	Adults feed on leaves. Host plant belongs to family Lamiaceae
Coleoptera (beetles)	Kateretidae (pollen beetles)	Brachypterus glaber	Urtica dubia	Larvae & adults feed on pollen. Host plant belongs to family Urticaceae
Coleoptera (beetles)	Kateretidae (pollen beetles)	Brachypterus labiatus	Urtica dubia	Larvae & adults feed on pollen. Host plant belongs to family Urticaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes coronillae	Coronilla glauca	Larvae & adults feed on pollen. Host plant belongs to family Fabaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes minutus	Teucrium lusitanicum	Larvae & adults feed on pollen. Host plant belongs to family Lamiaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes opacus	Ononis natrix	Larvae & adults feed on pollen. Host plant belongs to family Fabaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes planiusculus	Echium plantagineum	Larvae & adults feed on pollen. Host plant belongs to family Boraginaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes rotundicollis	Diplotaxis siifolia	Larvae & adults feed on pollen. Host plant belongs to family Brassicaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Meligethes viridescens	Hirschfeldia incana	Larvae & adults feed on pollen. Host plant belongs to family Brassicaceae
Coleoptera (beetles)	Nitidulidae (sap beetles)	Xenostromylyus sp.	Diplotaxis siifolia	Larvae & adults feed on pollen. Host plant belongs to family Brassicaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Lepidoptera (butterflies & moths)	Hesperiidae (skipper butterflies)	Carcharodus tripolina	Malva sylvestris	Larvae feed on leaves. Host plant belongs to family Malvaceae
Lepidoptera (butterflies & moths)	Hesperiidae (skipper butterflies)	Muschampia proto	Phlomis purpurea	Larvae feed on leaves. Host plant belongs to family Lamiaceae
Lepidoptera (butterflies & moths)	Lycaenidae (goassamer-winged butterflies)	Celastrina argiolus	Rubus ulmifolius	Larvae feed on leaves. Host plant belongs to family Rosaceae
Lepidoptera (butterflies & moths)	Lycaenidae (goassamer-winged butterflies)	Lampides boeticus	Fabaceae	Larvae feed on leaves. Polyphagous on Fabaceae
Lepidoptera (butterflies & moths)	Lycaenidae (goassamer-winged butterflies)	Leptotes pirithous	Fabaceae, Plumbaginaceae, Rosaceae	Larvae feed on leaves. Polyphagous on Fabaceae, Plumbaginaceae & Rosaceae
Lepidoptera (butterflies & moths)	Lycaenidae (goassamer-winged butterflies)	Zizeeria knysna	Poaceae	Larvae feed on leaves. Polyphagous on Poaceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Hipparchia fidia	Macrochloa tenacissima	Larvae feed on leaves. Host plant belongs to family Poaceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Lasiommata megera	Poaceae	Larvae feed on leaves. Polyphagous on Poaceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Pararge aegeria	Poaceae	Larvae feed on leaves. Polyphagous on Poaceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Pyronia bathseba	Poaceae	Larvae feed on leaves. Polyphagous on Poaceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Pyronia cecilia	Poaceae	Larvae feed on leaves. Polyphagous on Poaceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Vanessa atalanta	Carduus spp., Galactites tomentosus	Larvae feed on leaves. Host plants belong to family Asteraceae
Lepidoptera (butterflies & moths)	Nymphalidae (brush-footed butterflies)	Vanessa cardui	Malva sylvestris	Larvae feed on leaves. Host plant belongs to family Malvaceae

Order	Family	Taxon	Associated with	Ecology & Notes
Lepidoptera (butterflies & moths)	Papilionidae (swallowtail butterflies)	Iphiclides podalirius ssp. feisthameli	Crataegus monogyna	Larvae feed on leaves. Host plant belongs to family Rosaceae
Lepidoptera (butterflies & moths)	Papilionidae (swallowtail butterflies)	Papilio machaon	Foeniculum vulgare	Larvae feed on leaves. Host plant belongs to family Apiaceae
Lepidoptera (butterflies & moths)	Pieridae (white butterflies)	Anthocharis belia ssp. euphenoides	Biscutella spp.	Larvae feed on leaves. Host plant belongs to family Brassicaceae
Lepidoptera (butterflies & moths)	Pieridae (white butterflies)	Euchloe belemia	Hirschfeldia incana	Larvae feed on leaves. Host plant belongs to family Brassicaceae
Lepidoptera (butterflies & moths)	Pieridae (white butterflies)	Euchloe tagis	Iberis gibraltarica	Larvae feed on leaves. Host plant belongs to family Brassicaceae
Lepidoptera (butterflies & moths)	Pieridae (white butterflies)	Pieris brassicae	Brassicaceae	Polyphagous on Brassicaceae. Larvae feed on leaves
Lepidoptera (butterflies & moths)	Pieridae (white butterflies)	Pieris rapae	Brassicaceae	Polyphagous on Brassicaceae. Larvae feed on leaves

(c) Associated with animals present in the fossil record

This table lists species of insect that have been found in Gibraltar in association with animals that are present in the fossil record, or are closely related to species that are present in the fossil record (for example, Feral Cat and *Felis sylvestris* and Feral Goat and *Capra pyrenaica*).

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Aphodiidae (dung beetles)	Aphodius ibericus	Animal dung: Feral Goat	Feeds on dung
Coleoptera (beetles)	Cleridae (checkered beetles)	Necrobia ruficollis	Animal carcasses: Yellow-legged Gull	Predator on carcasses
Coleoptera (beetles)	Cleridae (checkered beetles)	Necrobia rufipes	Animal carcasses: Yellow-legged Gull	Predator on carcasses
Coleoptera (beetles)	Cleridae (checkered beetles)	Necrobia violacea	Animal carcasses: Yellow-legged Gull	Predator on carcasses

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Dermestidae (skin beetles)	Dermestes frischii	Animal carcasses: Yellow-legged Gull	Feeds on keratin (feathers & hair)
Coleoptera (beetles)	Dermestidae (skin beetles)	Dermestes undulatus	Animal carcasses: Yellow-legged Gull	Feeds on keratin (feathers & hair)
Coleoptera (beetles)	Drilidae (snail beetles)	Drilus mauritanicus	Snails: Rumina decollata	Larvae feed on snails
Coleoptera (beetles)	Histeridae (clown beetles)	Hypocaccus brasiliensis	Animal carcasses: Blackbird	Predator of maggots on carcasses
Coleoptera (beetles)	Histeridae (clown beetles)	Saprinus caerulescens	Animal carcasses: Yellow-legged Gull	Predator of maggots on carcasses
Coleoptera (beetles)	Histeridae (clown beetles)	Saprinus chalcites	Animal carcasses: Yellow-legged Gull	Predator of maggots on carcasses
Coleoptera (beetles)	Histeridae (clown beetles)	Saprinus deterius	Animal carcasses: Yellow-legged Gull, Horseshoe Whip Snake	Predator of maggots on carcasses
Coleoptera (beetles)	Histeridae (clown beetles)	Saprinus georgicus	Animal carcasses: Yellow-legged Gull	Predator of maggots on carcasses
Coleoptera (beetles)	Histeridae (clown beetles)	Saprinus politus	Animal carcasses: Blackbird	Predator of maggots on carcasses
Coleoptera (beetles)	Histeridae (clown beetles)	Saprinus subnitescens	Animal carcasses: Yellow-legged Gull, Horseshoe Whip Snake	Predator of maggots on carcasses
Coleoptera (beetles)	Lampyridae (fireflies)	Nyctophila reichii	Snails: several spp.	Larvae feed on various snail spp.
Coleoptera (beetles)	Leiodidae (fungus beetles)	Catops coracinus	Animal carcasses: Yellow-legged Gull, Horseshoe Whip Snake	Feeds on decomposing organic matter
Coleoptera (beetles)	Nitidulidae (sap beetles)	Nitidula flavomaculata	Animal carcasses	On bones and dead animal matter
Coleoptera (beetles)	Silphidae (carrion beetles)	Silpha puncticollis	Animal carcasses: Rabbit	Feeds on decomposing organic matter
Coleoptera (beetles)	Silphidae (carrion beetles)	Thanatophilus ruficornis	Animal carcasses: Yellow-legged Gull	Feeds on decomposing organic matter
Coleoptera (beetles)	Staphilinidae (rove beetles)	Creophilus maxillosus	Animal carcasses: Yellow-legged Gull, Common Dolphin, Feral Cat, Razorbill	Predator of maggots on carcasses
Coleoptera (beetles)	Trogidae	Trox fabricii	Animal carcasses: Yellow-legged Gull	Feeds on keratin (feathers & hair)
Hymenoptera (bees, wasps & ants)	Megachilidae	Rhodanthidium sp.	Snails: Otala lactea	Nests in empty shells of Otala lactea

(d) Associated with habitats that existed or currently exist around the caves complex

A very large number of species of insects that are currently found in Gibraltar would have been associated with the habitats that existed around the Gorham's Cave complex and its environs during the Pleistocene. The few beetles that are most characteristic of some of these habitats are listed in the table below.

Order	Family	Taxon	Associated with	Ecology & Notes
Coleoptera (beetles)	Carabidae (ground beetles)	Laemostenus mauritanicus	Caves, as a troglophile	Described from Gibraltar. Only found in near vicinity (up to Malaga)
Coleoptera (beetles)	Carabidae (ground beetles)	Scarites buparius	Sandy habitats	Common at the Alameda Gardens
Coleoptera (beetles)	Curculionidae (weevils)	Pselactus spadix	Dead wood	Bores into dead wood. Commonly associated with driftwood
Coleoptera (beetles)	Hydraenidae (water beetles)	Ochthebius lejolisi	Rock pools	Found at Governor's beach
Coleoptera (beetles)	Hydraenidae (water beetles)	Ochthebius quadricollis	Rock pools	Found at Governor's beach
Coleoptera (beetles)	Tenebrionidae (darkling beetles)	Akis acuminata	Sandy habitats	Very common on East Sand Slopes
Coleoptera (beetles)	Tenebrionidae (darkling beetles)	Ammobius rufus	Beaches	Common under vegetation on sand dunes in Gibraltar
Coleoptera (beetles)	Tenebrionidae (darkling beetles)	Erodius tibialis	Sandy habitats	Very common on East Sand Slopes
Coleoptera (beetles)	Tenebrionidae (darkling beetles)	Phaleria acuminata	Beaches	Common on sandy beaches in Gibraltar
Coleoptera (beetles)	Tenebrionidae (darkling beetles)	Pimelia fornicata	Sandy habitats	Very common on East Sand Slopes
Coleoptera (beetles)	Tenebrionidae (darkling beetles)	Zophosis minuta	Sandy habitats	Very common on East Sand Slopes

(e) Species that are endemic to Gibraltar

Gibraltar is home to a number of restricted-range invertebrate species and sub-species, including some beetles. Some of these are apparently endemic to the Rock. These are listed in the table below. Three of them are endogean species; they lack eyes and live deep within the soil. *Buprestis sanguinea* ssp. *calpetana* relies on *Ephedra fragilis* as its food plant. This plant species is included in the fossil record.

Order	Family	Taxon	Associated with	Ecology
Coleoptera (beetles)	Anthicidae (ant-like beetles)	<i>Clavicomus bruckii</i>	<i>Phagnalon saxatile</i>	Only known from Gibraltar; possibly endemic
Coleoptera (beetles)	Buprestidae (jewel beetles)	<i>Buprestis sanguinea</i> ssp. <i>calpetana</i>	<i>Ephedra fragilis</i>	Larvae feed within stems. Endemic to Gibraltar
Coleoptera (beetles)	Staphilinidae (rove beetles)	<i>Lusitanopsis herculeana</i>	Soil	Endogean. Endemic to Gibraltar. Only known from Upper Rock
Coleoptera (beetles)	Staphilinidae (rove beetles)	<i>Lusitanopsis</i> nov. sp.	Soil	Endogean. Endemic to Gibraltar. Known from Upper Rock & Alameda
Coleoptera (beetles)	Staphilinidae (rove beetles)	<i>Paratyphlus</i> nov. sp.	Soil	Endogean. Endemic to Gibraltar. Known from Upper Rock & Windmill Hill

Appendix 3

Institutions that have contributed to the research at Gorham's and Vanguard Caves, 1989-2014 (in alphabetical order)

1. Anglia Ruskin University, Cambridge, United Kingdom
2. Australian National University, Canberra, Australia
3. Boston University, United States of America
4. Estación Biológica de Doñana (CSIC), Spain
5. Institut Catala de Paleontologia, Cerdanyola de Valles, Spain
6. Instituto Andaluz de Ciencias de la Tierra (CSIC-UGR), Granada, Spain
7. Instituto de Historia (CSIC), Madrid, Spain
8. Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan
9. Manchester Metropolitan University, United Kingdom
10. Max Planck Institute, Leipzig, Germany
11. McMaster University, Ontario, Canada
12. Museo Municipal de El Puerto Santa María, Cádiz, Spain
13. Museo Municipal de Villamartín, Cádiz, Spain
14. Museo Nacional de Ciencias Naturales (CSIC), Madrid, Spain
15. Muséum National d'Histoire Naturel, Paris, France
16. Oxford Brookes University, United Kingdom
17. Royal Holloway College, University of London, United Kingdom
18. The British Museum, London, United Kingdom
19. The Natural History Museum, London, United Kingdom
20. Universidad Autonoma, Madrid, Spain
21. Universidad Complutense, Madrid, Spain
22. Universidad de Alcalá de Henares, Spain
23. Universidad de Cádiz, Spain
24. Universidad de Córdoba, Spain
25. Universidad de Granada, Spain
26. Universidad de Huelva, Spain
27. Universidad de Málaga, Spain
28. Universidad de Murcia, Spain
29. Universidad de Sevilla, Spain
30. Universidad de Zaragoza, Spain
31. Universitat Rovira I Virgili, Tarragona, Spain
32. Université Bordeaux, France
33. Université Catholique de Louvain, Brussels, Belgium
34. University of California, Los Angeles, United States of America
35. University of Cambridge, United Kingdom
36. University College, Cork, Ireland
37. University College London, United Kingdom
38. University of Oxford, United Kingdom
39. University of Queensland, Brisbane, Australia
40. University of Santa Cruz, California, USA
41. University of Saskatchewan, Canada
42. University of Southampton, United Kingdom
43. University of Toronto, Canada
44. University of York, United Kingdom





GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS

World Heritage Site Nomination



Volume 2: Section 7.b Texts



Department
for Culture
Media & Sport



The
Gibraltar Museum



HM Government
of Gibraltar



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Table of Contents

Gibraltar Heritage Trust Act 1989	7
Endangered Species Act 1990	46
Nature Protection Act 1991	76
Nature Conservation Area (Upper Rock) Designation Order 1993	269
Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations 1993	272
Nature Conservation (Designation of Gibraltar Nature Reserve) Order 2013	280
Nature Protection Act (Powers and Duties of Wildlife Wardens) Regulations 2013	283
Nature Protection (Nature Conservancy Council) Regulations 2013	286
Environmental Protection (Trees) Act 2014	291
European Habitat Directive of 21 May 1992	310
Marine Nature Reserve Regulations 1995	355
Marine Strategy Regulations 2011	369
Marine Protection Regulations 2014	402
Gibraltar Port Authority Act 2005	452
Environment Act 2005	465
Environment (Quality of Bathing Water) Regulations 2009	499
Town Planning Act 1999	530

Town Planning (Environmental Impact Assessment) Regulations 2000	576
Town Planning (General Procedures) Regulations 2001	615
Town Planning (Building Development Control) Regulations 2001	648
Gibraltar Development Plan Parts 1 and 2 2009	656
GONHS Upper Rock Nature Reserve - A Management Action Plan 2005	817
Biodiversity Action Plan Gibraltar: Planning for Nature 2006	1091
Environmental Action & Management Plan 2013	1286
H.M. Government of Gibraltar Preliminary Flood Risk Assessment 2011	1325

Gibraltar Heritage Trust Act 1989

GIBRALTAR HERITAGE TRUST ACT 1989**Principal Act**

Act. No. 1989-12	<i>Commencement</i>	1.5.1989
	<i>Assent</i>	27.4.1989

Amending enactments	Relevant current provisions	Commencement date
LN. 1989/042	<i>Corrigendum</i>	1.5.1989
Act. 1991-18	ss.18(1) and 50	1.9.1991
2001-17	ss. 2(a) and 33	7.6.2001
2007-17	ss. 8(4) & (5), 10(2), 12(1), 12(3), 12(4), 12(6), 12(7), 12(8), 21(1), 30(1), 35, 36(1), 36(2), 37(1), 37(2), 37(4), 39(2), 39(3), 41(2), 42(1), 42(2), 43(1), 43(2), 44(1), 45(1), 46(1), 46(3), 47(1), 47(2), 47(3), 47(4), 49 and 51	14.6.2007
2011-14	ss. 16, 17, 18(1), (2) & (3) 23(2)(c), 24(1), (2), (3) & (4), 25(1), (2) & (4), 26, 27, 28, 29(1) & (2), 30(1), 31(1), 32 & 33(2)	8.9.2011
LN. 2014/263	Sch.	22.12.2014

English sources

None

ARRANGEMENT OF SECTIONS.

Section

1. Short title and commencement.
2. Interpretation.
3. Incorporation of Gibraltar Heritage Trust.
4. Objects and powers of the Trust.
5. Board of the Trust.
6. Staff.
7. Financial provisions.
8. Accounts.
9. Instruments.
10. The Board's general functions.
11. Additional powers of the Board.
12. Constitution of the Board.
13. Exemption from taxes, etc.
14. Membership.
15. General meetings.

THE MUSEUM.

16. General functions.
17. General powers.
18. Curator.
19. Vesting of property of Museum.
20. Property to be held for the benefit of the public.
21. Declaration of antiquities.
22. Title to antiquities.
23. Delivery of antiquities to the Curator on discovery.
24. Disposal of antiquity discovered.
25. Arbitration.
26. Investigations on behalf of the Gibraltar Culture and Heritage Agency.
27. Restrictions on exploration without licence.
28. Qualifications for licence.
29. Issue of licences.
30. Designation of areas of archaeological importance.
31. Notice of operations in designated areas.
32. Right of the Gibraltar Culture and Heritage Agency to inspect operations.
33. Restrictions on removal of antiquities from Gibraltar.

LISTED BUILDINGS, STRUCTURES, SITES AND LAND.

34. Schedule of Listed Buildings, etc. Category "A".
35. Amendment of Schedule 1.

36. Restrictions on amendment of Schedule 1.
37. Acquisition of sites worthy of listing.
38. Compensation.
39. Protection of building, etc. Listed “A”.
40. Schedule of Listed Buildings, etc. Category “B”.
41. Additions to Schedule 2.
42. Amendment of Schedule 2.
43. Publication and service of notice.
44. Contents of notice.
45. Filing of objections.
46. Hearing of objections.
47. Determination of objections.
48. Compensation on designation.
49. Restrictions as to Listed “B” buildings, etc.
50. Offences.
51. Regulations by the Government.
52. Transfer of assets and liabilities.
53. Repeals.

SCHEDULE 1.

Listed buildings etc., Category ‘A’

SCHEDULE 2.

Listed buildings etc., Category ‘B’.

SCHEDULE 3.

Classes of membership.

Gibraltar Heritage Trust

AN ACT TO ESTABLISH THE GIBRALTAR HERITAGE TRUST.

Short title and commencement.

1. This Act may be cited as the Gibraltar Heritage Trust Act 1989, and shall come into operation on such day as the Governor may appoint by notice in the Gazette and different days may be so appointed for different provisions and different purposes.

Interpretation.

2. In this Act, unless inconsistent with the context—

“Agency” means the Gibraltar Tourism Agency Limited;

“antiquity” includes—

- (a) any object of historical, geographical, artistic, scientific or technical value or interest found or situated in Gibraltar (whether in or on the land or below the seabed), being older than fifty years; and
- (b) any object that is declared under section 17 to be an antiquity; and
- (c) any listed building, structure, site or land;

“Board” means the Board of the Trust set up under section 5;

“Chairman” means the Chairman of the Trust;

“financial year” means a year commencing on the 1st day of April;

“Gibraltar heritage” includes—

- (a) buildings, structures, antiquities, works of art or craft, books, records and other chattels, wherever situated and being of historical, architectural, artistic, scientific or social interest in connection with Gibraltar; and
- (b) areas of natural interest or beauty in Gibraltar along, where appropriate, with their animal and plant life;

“Listed building, structure, site or land” means any building, structure, site or land described in Schedules 1 or 2 and also means in relation

to any such building, structure or site, those parts of the land on which it is situated that are required for the purposes of fencing, covering or otherwise preserving or providing means of access to the building, structure or site;

“Museum” means Gibraltar Museum;

“Secretary” means the Secretary of the Trust appointed under section 6;

“Site” includes any geological feature or the animals or plants therein or thereon;

“Trust” means the Gibraltar Heritage Trust established under the Act;

“trustee” means a member of the Board;

“Vice-Chairman” means the Vice-Chairman of the Trust;

Incorporation of Gibraltar Heritage Trust.

3. There is hereby established a new body to be known by the name of the Gibraltar Heritage Trust, replacing the former Gibraltar Heritage Trust, and the Trust shall be a body corporate with perpetual succession and a common seal.

Objects and powers of the Trust.

4. (1) The Trust is established for the purposes of preserving Gibraltar’s heritage.

(2) The acquisition in any manner and retention of any investments (being at the time of acquisition of a nature authorised by the general law for the investment of trust funds or of a nature authorised by the trusts imposed by the donor of the same or of the funds out of which the same shall be acquired) the income whereof shall be applicable (subject to any trusts imposed by the donor or otherwise affecting the same) at the discretion of the Board for any particular purpose of the Trust or for its general purposes.

Board of the Trust.

5.(1) The affairs of the Trust shall be administered by a board to be called “The Board of Gibraltar Heritage Trust”.

(2) The Board shall have power to appoint such sub-committees as it considers appropriate.

Staff.

Gibraltar Heritage Trust

6.(1) There shall be a Secretary and a Treasurer to the Trust who shall be appointed by the Board (not from among their own number).

(2) The Secretary shall be responsible to the Board for the general exercise of the Board's functions.

(3) The Board may appoint such other employees as the Board thinks fit.

(4) The Board shall pay to their employees such remuneration and allowances as the Board may determine.

(5) The employees shall be appointed on such other terms and conditions as the Board may determine.

(6) No person employed and paid by the Trust shall be a trustee.

Financial provisions.

7.(1) The funds of the Trust shall consist of—

- (a) subject to the terms of any trust, such moneys as may be received from the sale, lease, hiring out, lending or other disposal, exhibition or display of any property under its control, (which, in relation to Museum artefacts, shall relate only to copies of such artefacts, the originals remaining in the Museum);
- (b) any money received from the Agency by way of royalties on ticket sales for admission to any properties in which the Trust has an interest by virtue of Schedules 1 and 2 and which are administered or managed by the Agency;
- (c) subject to the terms of any trust, such moneys as may be received by the Board by way of subscriptions, contributions, donations or gifts or as may be otherwise received for any lawful purpose; and
- (d) all accumulations of its funds.

(2) Where the Board acquires any money for any particular specified purpose, it shall keep that money in a separate account and apply it for that purpose.

(3) The Board may borrow temporarily by way of overdraft or otherwise such sums as it may require for meeting its obligations and discharging its functions.

Accounts.

8.(1) The Board shall keep proper books of account of its operations during each financial year, and shall also cause a statement of its accounts for each financial year to be prepared within three months after the end of that year.

(2) The accounts of the Trust for each financial year shall be audited by the Principal Auditor as soon as practicable after the end of that year.

(3) The Principal Auditor shall, with reference to the accounts of the Trust report—

- (a) whether he has obtained all the information and explanations which to the best of his knowledge and belief were necessary for the purposes of the audit; and
- (b) whether, in his opinion, proper books of account have been kept by the Trust, so far as appears from his examination of those books; and
- (c) whether the Trust's balance sheet and statement of income and expenditure are in agreement with the books of accounts; and
- (d) whether, in his opinion, and to the best of his information and according to the explanations given him, those accounts give a true and fair view—
 - (i) in the case of the balance sheet, of the state of the Trust's affairs as at the end of its financial year; and
 - (ii) in the case of the statement of income and expenditure of the income and expenditure for its financial year.

(4) Within three months after the audit of its accounts for any financial year, the Board shall prepare and submit to the Government a written report on its operations for that year together with a copy of the audited accounts for that year, and shall also submit copies of the report and the audited accounts to the Minister responsible for heritage.

(5) The Minister responsible for heritage shall lay one copy of the annual report and of the audited accounts on the table of the Parliament as soon as practicable after they have been received by him.

Instruments.

Gibraltar Heritage Trust

9. (1) The fixing of the seal of the Board shall be authenticated by signature of two trustees, subject to resolution approved by not less than two-thirds of the Board.

(2) A document purporting to be duly executed under the seal of the Board, or to be signed on the Board's behalf, shall be received in evidence and, unless the contrary is proved, be deemed to have been executed and signed.

The Board's general functions.

10. (1) Without prejudice to the generality of section 4 it shall be the general duty of the Board—

- (a) to promote and secure the preservation and enhancement of Gibraltar's heritage;
- (b) at the request of Government, to advise Government and, where appropriate the Secretary of State, at an early stage and prior to any consents being granted, on any planning or other proposals affecting any Listed building, structure, site or land;
- (c) to promote the public's enjoyment of and advance their knowledge of Gibraltar's heritage;
- (d) to promote research into and publications on Gibraltar's heritage and on the history of Gibraltar including its social, cultural, economic and political evolution;
- (e) to assist the Government of Gibraltar in the formulation of policy in respect of these matters;
- (f) to undertake such other functions as are conferred on it by this Act or by any other enactment.

(2) The Board—

- (a) shall (so far as practicable) provide educational facilities and services, instruction and information to the public in relation to Gibraltar's heritage;
- (b) if requested by the Government, or if the Board otherwise thinks fit to do so, shall advise the Government on any matter relating to the objects of the Trust;

- (c) may, for the purpose of exercising its functions, carry out, or defray, or contribute towards the cost of research in relation to Gibraltar's heritage;
 - (d) may, for the purpose of exercising its functions, make and maintain records in relation to Gibraltar's heritage.
- (3) May make such charges for any of their services as they think fit.

Additional powers of the Board.

11. (1) The Board may make arrangements on its own behalf or enter into contracts which have any of the objects mentioned in subsection (2).

- (2) The objects are—
- (a) the production, publication and sale of books, films or other informative material relating to Gibraltar's heritage; and the commissioning of works of art, craft or design relating thereto;
 - (b) the production and sale of replicas or reproductions of works of art, craft or souvenirs relating to Gibraltar's heritage.

(3) The Board may acquire and hold interests in any company or other body having any of the objects mentioned in subsection (2), exercise rights conferred by the holding of an interest in it, and provide financial or other assistance to or in respect of it (including assistance by way of guarantee of the obligations of such a company or body).

Constitution of the Board.

12. (1) Subject to subsection (5) the Board shall consist of twelve trustees six of whom shall be appointed by the Government for such term as shall be specified in the Instrument of Appointment. The remaining six trustees shall be elected at an Annual General Meeting of the Trust.

(2) Subject to subsection (5) a Chairman and Vice-Chairman shall be elected by the trustees from among themselves.

(3) If a trustee appointed by the Government dies or resigns or otherwise ceases to be a trustee, the Government may appoint in his place another person.

(4) The Government may discharge an appointed trustee from his office as such at any time.

Gibraltar Heritage Trust

(5) If an elected trustee dies or resigns or otherwise ceases to be a trustee, the Board may appoint in his place another person and the person so appointed shall hold office until the next Annual General Meeting of the Trust.

(6) An elected trustee may resign his office by notice in writing addressed to the Chairman. A Chairman or Vice-Chairman may resign his office by notice in writing addressed to the Government. A trustee who absents himself from three consecutive meetings of the Board, without leave of the Board, shall be deemed to have resigned his office.

(7) An appointed trustee may resign his office by notice in writing addressed to the Government.

(8) The Chairman, the Vice-Chairman and the trustees of the first Board to be set up under this Act shall be appointed by the Government after consultation with the Chairman of the former Gibraltar Heritage Trust and the Chairman of the former Museum Committee. In exercising his powers under this subsection, the Government shall have regard to the desirability of the persons having knowledge or experience of matters falling within the purposes of the Trust or any other subject, knowledge or experience which would be of use to the Board in exercising its functions. Subject to subsections (5) and (7) a trustee so appointed shall hold office for a maximum term of two years.

(9) At the second annual general meeting the elected trustees shall retire from office but shall be eligible for re-election at such annual general meeting.

(10) At the third and every subsequent annual general meeting of the Trust, one third of the elected trustees shall retire and shall be eligible for re-election. The members of the Board shall decide among themselves which of the elected trustees shall retire at the third annual general meeting and which of them, other than those elected at the third annual general meeting, shall retire at the fourth annual general meeting. Thereafter, one third of the elected trustees shall retire on rotation.

(11) A person is disqualified from the office of trustee if—

- (a) he is an undischarged bankrupt, or
- (b) he has been convicted by any court of a criminal offence involving fraud or dishonesty and sentenced to a term of imprisonment without option of a fine.

(12) The validity of any proceedings of the Board shall not be affected by any vacancy among the trustees or by any defect in the appointment of the trustees.

(13) The Board may regulate its own procedure.

(14) An elected trustee may be removed from office at any time by a resolution passed at a general meeting of the Trust by a majority of not less than two-thirds of the members present at the meeting.

Exemption from taxes, etc.

13. The Trust shall be exempt from all taxes, duties, rates, levies or other charges whatsoever.

Membership.

14. The membership, if any, of the Trust shall be divided into the classes specified in Schedule 3 hereto.

General meetings.

15. General meetings of the Trust shall be held once at least in every year and shall be called and held in accordance with such rules as may be made by resolution of the Board passed at its meeting by a majority of not less than two-thirds of the trustees present at the meeting, and approved at the next meeting of the Trust.

THE MUSEUM.

General functions.

16. The Gibraltar Culture and Heritage Agency shall have the following functions in relation to the Museum—

- (a) to promote and undertake the discovery, identification, preservation, exhibition, appreciation and enjoyment of antiquities in Gibraltar;
- (b) to promote and undertake research in respect of antiquities;
- (c) to assist the Government in the formulation of policy in respect of those matters;
- (d) to undertake such other functions as are conferred on it by this Act or by any other enactment.

Gibraltar Heritage Trust

General powers.

17. In the performance of its functions in relation to the Museum, the Gibraltar Culture and Heritage Agency shall have the following powers and policy—

- (a) to accept by way of gift, loan or donation—
 - (i) antiquities;
 - (ii) books, manuscripts, pamphlets, reports, maps, pictures, and other documents that relate to Gibraltar and are suitable for the purposes of a reference library or archives;
 - (iii) other articles that are suitable for study or exhibition;
- (b) subject to the terms of any trust, to hire out, exchange or lend copies of antiquities and other articles (including anything specified in paragraph (a) above);
- (c) to commission the undertaking of investigations to discover, obtain, or recover antiquities, and the undertaking of research for the purposes of this Act;
- (d) such other powers as may be conferred on it by this Act or by any other enactments; and
- (e) such other powers as are reasonably necessary or incidental for the purposes of this Act.

Curator.

18. (1) There shall from time to time be appointed, on the advice of the Gibraltar Culture and Heritage Agency, a fit and proper person being suitably qualified to be Curator of the Museum.

(2) The Curator shall be the chief executive officer of the Museum and shall be responsible to the Gibraltar Culture and Heritage Agency for its due management.

(3) The Gibraltar Culture and Heritage Agency shall have due regard to the views of the Gibraltar Culture and Heritage Agency in relation to those areas of the management of the Museum which relate to the Gibraltar Culture and Heritage Agency's functions and powers under this Act.

Vesting of property of Museum.

19. All antiquities, objects of art or interest, money, securities for money, and all other property, whether moveable or immoveable, acquired or held by the Museum, or which may hereafter be acquired by the Museum, are vested in the Government of Gibraltar, subject always to the terms on which they were acquired or held and to the terms of any trust.

Property to be held for the benefit of the public.

20. (1) All property that is vested in the Government of Gibraltar by virtue of sections 19 and 22 shall be so held in trust and shall be applied for the benefit and enjoyment of the public.

(2) All antiquities and objects of art or interest that are for the time being lent to the Museum shall, subject to the conditions on which they have been lent, be held in trust and applied for the benefit and enjoyment of the public.

Declaration of antiquities.

21. (1) The Government may, by Order, after consultation with the Board and the Gibraltar Culture and Heritage Agency, declare any object that is not older than one hundred years but is otherwise an object described in paragraph (a) of the definition of the term “antiquity” in section 2, to be an antiquity.

(2) Every Order made under subsection (1) shall be published in the Gazette.

Title to antiquities.

22. Subject to the provisions of this Act, every antiquity in Gibraltar, wherever situated, that has not been discovered before the date of the commencement of this Act, is hereby vested in and shall be the property of the Government of Gibraltar.

Delivery of antiquities to the Curator on discovery.

23. (1) Any person who discovers an antiquity in Gibraltar shall as soon as practical—

- (a) notify the Curator; and
- (b) if the antiquity is portable, deliver it to the Curator;

Gibraltar Heritage Trust

- (c) in every case, inform the Curator where it was discovered, in sufficient detail to enable the Curator to locate that place.
- (2) On receiving an antiquity under subsection (1), the Curator shall—
- (a) issue to that person by whom it was delivered a receipt fully describing the antiquity;
 - (b) retain the antiquity in safe custody; and
 - (c) report the discovery to the Gibraltar Culture and Heritage Agency.
- (3) This section shall not apply to an antiquity discovered by a person in exercising his right to excavate pursuant to a licence issued to him under section 29.

Disposal of antiquity discovered.

24. (1) On receiving any report of the discovery of an antiquity in Gibraltar, the Gibraltar Culture and Heritage Agency shall consider whether it should be retained by the Government of Gibraltar in the Museum or in any other manner.

(2) Where the Gibraltar Culture and Heritage Agency considers that the antiquity should be retained, it shall recommend to the Government to pay to the person by whom it was discovered such amount as to the Gibraltar Culture and Heritage Agency reasonably appears to be a fair reward, having regard to the circumstances of the discovery, including the degree of effort and risk involved in recovering the antiquity and its value to the community.

(3) Where the Gibraltar Culture and Heritage Agency does not consider that the antiquity should be retained, it may offer the antiquity to the British Museum or to any other public museum, on such terms and conditions as the Gibraltar Culture and Heritage Agency and that museum may agree, including in every case, however, a condition that the museum to which it is offered shall pay to the person by whom it was discovered a reward determined in accordance with this Act.

(4) Where the Gibraltar Culture and Heritage Agency does not otherwise deal with the antiquity under this section, the Curator shall return it to the person by whom it was discovered, together with a permit authorising him to retain or dispose of the antiquity in such manner as he thinks fit.

Arbitration.

25. (1) Any person who, being the discoverer of an antiquity, is dissatisfied with the amount of any reward offered to him under section 24 may, by notice in writing served on the Gibraltar Culture and Heritage Agency within twenty-eight days after the day on which the reward is offered to him, require the matter to be determined by arbitration under this section.

(2) On receipt of a notice under subsection (1), the Gibraltar Culture and Heritage Agency shall forthwith request the Chief Justice to appoint an arbitrator to determine the reward, and the Chief Justice may appoint an arbitrator accordingly.

(3) The decision of the arbitrator appointed by the Chief Justice shall be final and binding on both parties.

(4) In making any award under this section, the arbitrator may allow the Gibraltar Culture and Heritage Agency such reasonable time as he may specify, to pay the reward.

(5) On the determination of any arbitration under this section, the Chief Justice may, on application by either party, make such order as to costs in the matter as he thinks fit.

Investigations on behalf of the Gibraltar Culture and Heritage Agency.

26. The Gibraltar Culture and Heritage Agency may carry out or cause to be carried out on its behalf, explorations, searches, and excavations to discover and obtain antiquities.

Restrictions on exploration without licence.

27. Except as provided in section 26, no person shall carry out or cause to be carried out any exploration, search or excavation to discover, obtain or recover any antiquity, whether on his own land or elsewhere, unless he does so pursuant to a licence issued by the Gibraltar Culture and Heritage Agency under section 29, and in compliance with the conditions of the licence.

Qualifications for licence.

28. No person shall be granted a licence unless he satisfies the Gibraltar Culture and Heritage Agency that—

- (a) he is by training and experience a competent person to undertake the activity for which the licence is sought;
- (b) adequate provisions have been made for the suitable publication of the results of the proposed activity;

Gibraltar Heritage Trust

- (c) adequate financial arrangements have been made or will be made for the undertaking of the activity;
- (d) adequate arrangements have been made or will be made for the safety of persons who are engaged in or may be affected by the activity and for the safeguarding and protection of public and private property, and for the avoidance of unreasonable inconvenience to persons not involved in the undertaking of the activity.

Issue of licences.

29. (1) On the written application of any person, the Gibraltar Culture and Heritage Agency may if it is satisfied that he is qualified to hold a licence under this section, grant or issue to him a licence to exploit, search for or excavate in Gibraltar, to discover, obtain or recover any antiquity.

(2) Every licence shall be granted subject to such conditions (if any) as may be specified by the Gibraltar Culture and Heritage Agency.

(3) Without prejudice to the generality of subsection (2), a licence may be granted on the condition that the site at which the operations are carried out shall be restored after they are completed and that full records are kept of the operations.

(4) Nothing in this section shall be construed so as to authorise a licensee to do any act in contravention of any right of any person over property without that person's consent.

Designation of areas of archaeological importance.

30. (1) The Government, after consultation with the Gibraltar Culture and Heritage Agency, may from time to time by Order designate as an area of archaeological importance, any defined area which appears to him to merit treatment as such for the purposes of this Act.

(2) Every such Order shall be known as a "Designation Order", and shall be published in the Gazette.

Notice of operations in designated areas.

31. (1) No person shall carry out or cause to be carried out in any designated area, any operation without first having given notice of the operation to the Gibraltar Culture and Heritage Agency.

(2) Every notice that is to be given under this section shall specify the operation to be carried out, the date or dates of the operation, and the site of the operation.

Right of the Gibraltar Culture and Heritage Agency to inspect operations.

32. Where any operation is to be carried out or is being carried out in a designated area, any member of the Gibraltar Culture and Heritage Agency or any public officer authorised for the purpose by the Gibraltar Culture and Heritage Agency may—

- (a) enter on the site to inspect the site and observe the operation;
- (b) record matters of antiquary importance discovered on the site or during the operation; and
- (c) for such purposes, order the operation to be suspended for any period not exceeding forty-eight hours.

Restrictions on removal of antiquities from Gibraltar.

33.(1) Antiquities shall not be exported to any destination save under the authority of a permit, and provided that all conditions attaching to the said permit are complied with.

(2) Permission to export antiquities under subsection (1) may be granted by the Minister with responsibility for Heritage after consultation with the Gibraltar Culture and Heritage Agency.

(3) Without prejudice to section 2, “antiquities”, for the purposes of this section, shall also include any goods manufactured or produced more than 50 years before the proposed date of exportation except—

- (a) postage stamps and other articles of philatelic interest;
- (b) birth, marriage or death certificates or other documents relating to the personal affairs of the exporter or the spouse of the exporter;
- (c) letters or other writings written by or to the exporter or the spouse of the exporter; and
- (d) any goods exported by, and being the personal property of, the manufacturer or producer thereof, or the spouse, widow or widower of that person.

Gibraltar Heritage Trust

(4) This section shall bind the Crown.

LISTED BUILDINGS, STRUCTURES, SITES AND LAND.

Schedule of Listed Buildings, etc. Category “A”.

34. The buildings, structures, sites and land specified in Schedule 1 shall be listed as being of Category “A”.

Amendment of Schedule 1.

35. Subject to section 36, the Government may, by Order, after consultation with the Board, from time to time amend Schedule 1—

- (a) by adding to or deleting from that Schedule any building, structure, site or land; or
- (b) by varying the description of any building, structure, site or land in that Schedule.

Restrictions on amendment of Schedule 1.

36. (1) The Government shall not add to Schedule 1 any building, structure, site or land, or any part thereof, unless—

- (a) it is Crown land; or
- (b) it has first been acquired for the Government of Gibraltar under section 37.

(2) The Government shall not without the prior consent of a Secretary of State, add to Schedule 1 any building, structure, site or land or part thereof, held by or on behalf of the Crown for the purposes of the Government of the United Kingdom, or vary the description in that Schedule of any such building, structure, site or land.

Acquisition of sites worthy of listing.

37. (1) Where the Government, after consultation with the Board considers that it is desirable that the whole or any part of any building, structure, site or land should be acquired by the Government of Gibraltar for the purposes of Schedule 1, he may acquire it by way of purchase, exchange or gift for the Government.

(2) Where the Government, after consultation with the Board, is satisfied—

- (a) that the whole of any building, structure, site or land should be acquired for the purposes of Schedule 1; and
- (b) that it is for the public benefit that it should be so acquired; and
- (c) that there is reasonable justification for the causing of any hardship that may result to any person having an interest in or right over it he may, subject to sections 38 and 39, acquire it under the Land (Acquisition) Act^{*}.

(3) For the purposes of the Land (Acquisition) Act, the acquisition of land pursuant to subsection (2) shall be a public purpose.

(4) Where the Government, acting under subsections (1) or (2), acquires the whole or any part of any building, structure, site or land, he shall as soon as practicable thereafter cause it to become Listed “A” by amending Schedule 1 in pursuance of the powers conferred on him by section 35.

Compensation.

38. Notwithstanding any provision to the contrary in the Land (Acquisition) Act, in assessing under that Act any compensation that is to be paid for the acquisition under section 37(2), of the whole or any part of the building, structure, site or land, the architectural, archaeological, artistic, historical and traditional factors that contribute to its value shall be disregarded, except to the extent that the person entitled to compensation proves that in acquiring his estate or interest in it, he paid valuable consideration in good faith for any such factors.

Protection of building, etc. Listed “A”.

39. (1) Subject to subsection (2), no person shall in relation to any building, structure, site or land contained in Schedule 1—

- (a) carry out any act of wilful destruction, injury or defacement on any such building, structure, site or land;
- (b) by any act, wilfully alter, impair or spoil the character of such building, structure, site or land; or
- (c) remove from any such building, structure, site or land any material or thing that forms part of any such building, structure, site or land; or

^{*} 1973-22

Gibraltar Heritage Trust

- (d) erect, build or place on or against any such building, structure, site or land any erection, building or other structure; or
- (e) enclose any such building, structure, site or land or any part thereof; or
- (f) deposit litter or refuse in or on any such building, structure, site or land other than in a receptacle provided by or with the permission of the Board for that purpose; or
- (g) occupy or encroach on any part of any such building, structure, site or land.

(2) Subject to subsection (3), the Government, after consulting the Board—

- (a) may authorise the alteration of any building, structure, site or land or the removal of any material from any such building, structure, site or land; or
- (b) may grant to any person a licence, revocable at will and without payment of compensation for its revocation, to occupy any specified part of any such building, structure, site or land for any purpose specified in the licence (not being a purpose that is incompatible with the character of such building, structure, site or land), and on such conditions as the Government may specify in the licence.

(3) The Government shall not give authority or licence under subsection (2) unless he is satisfied that to do so would not impair the integrity of the building, structure, site or land.

Schedule of Listed Buildings, etc. Category “B”.

40. The buildings, structures, sites or land specified in Schedule 2 shall be listed as being of Category “B”.

Additions to Schedule 2.

41. (1) For the purpose of this Act and with a view to the guidance of the Development and Planning Commission in the performance of its functions under the Town Planning Act[∞] in relation to Listed “B” buildings, structures, sites or land, the Trust shall compile a list thereof, which list will

[∞] 1973-08

include if appropriate the buildings and structures comprising Schedule 2 to the former Gibraltar Museum and Antiquities Act[♦].

(2) Any such list compiled shall, once approved by the Government, form a part of Schedule 2 hereto.

(3) In considering whether to include in a list compiled under subsection (1), the Board may take into account not only the building, structure, site or land itself, but also—

- (a) any respect in which the exterior contributes to the architectural or historic interest of any group of buildings of which it forms part; and
- (b) the desirability of preserving, on the ground of its architectural or historic interest, any feature of the building or structure consisting of a man-made object or structure fixed to it or adjoining it or forming part of the land and comprised within the curtilage of the building.

(4) Before compiling any list under this section, the Board shall consult with the Government and with such persons or bodies of persons as appear appropriate as having special knowledge of or interest in, buildings or structures of architectural or historic interest.

Amendment of Schedule 2.

42. (1) Subject to sections 43, 46 and 47, the Government may, after consultation with the Board, (acting either on its own initiative or on application from the owner of a building, structure, site or land) from time to time amend Schedule 2—

- (a) by adding or deleting from that Schedule any building, structure, site or land; or
- (b) by varying the description of any building, structure, site or land in that Schedule.

(2) The Government shall not, without the prior consent of a Secretary of State, add to Schedule 2 any building, structure, site or land held by or on behalf of the Crown for the purposes of the Government of the United Kingdom or vary the description in that Schedule of any such building, structure, site or land.

Publication and service of notice.

[♦] 1982-20

Gibraltar Heritage Trust

43. (1) Not less than three months before exercising any power conferred on him by section 42, the Government shall publish a notice in the Gazette of his intention to do so.

(2) The Government shall also cause a copy of the notice to be served on every person having any estate or interest in the building, structure, site or land to which the notice relates.

Contents of notice.

44. (1) Every notice shall specify the building, structure, site or land to which it relates and shall adequately describe the manner in which the Government proposes to exercise his powers under section 42 in relation to the building or structure.

(2) Every notice shall state that every person aggrieved by the proposed exercise of the power may within one month after the date on which notice is published in the Gazette or (in the case of a person having an estate or interest in the building or structure within one month after the date of service of the notice on him), may object in writing to the Board.

Filing of objections.

45. (1) A person who is aggrieved by the proposed exercise of any power of the Government under section 42 may, within the time specified in section 44, serve a notice of objection on the Board.

(2) Every notice of objection shall specify the grounds of the objection but no objection shall be allowed on the ground that the objector will suffer financial loss.

Hearing of objections.

46. (1) On the expiry of the time specified in section 44 for filing notices of objection to the proposed exercise of any power of the Government under section 42, where any such notices have been filed and have not been withdrawn, the Board shall appoint a time, date and place for the hearing of the objections, and shall give every objector not less than fourteen days notice in writing of the time, date and place of hearing.

(2) At the hearing, every objector may appear either personally or by counsel, and may call evidence in support of his objection and may cross-examine witnesses called by any other party and make submissions in support of his objection.

(3) After giving every objector who appears at the hearing an opportunity to be heard, the Board shall consider and advise the Government on the objections.

Determination of objections.

47. (1) On considering the advice of the Board on the objections heard under section 46, the Government shall determine every such objection by allowing it wholly or partly, or by disallowing it.

(2) The Government shall cause notice of his decision in relation to each objection to be published in the Gazette, and a copy of the notice to be served on each objector.

(3) Subject to subsection (4), where any objections have been heard under section 46, the Government may, on the expiry of the period of one month following the date on which notice under subsection (2) is published in the Gazette, proceed to exercise the powers conferred on him by section 42.

(4) Where the Government has allowed an objection wholly or partly, he shall not exercise his powers under section 42 in a manner which is contrary to his decision in so allowing it.

Compensation on designation.

48. (1) Any person who is injuriously affected by the designation after the commencement of this Act of any building, structure, site or land as Listed “B”, shall, subject to subsection (2), be entitled to compensation for the loss he has thereby sustained, to be determined under the Land (Acquisition) Act.

(2) Notwithstanding any provision to the contrary in the Land (Acquisition) Act, in assessing under that Act any compensation that is to be paid for injurious affection, the archaeological, architectural, artistic, historical and vernacular factors that contribute to the value of any building, structure, site or land shall be disregarded except to the extent that the person entitled to compensation proves that he has acquired an estate or interest therein, and in doing so that he paid valuable consideration in good faith for any such factors.

Restrictions as to Listed “B” buildings, etc.

49. No person who is beneficially interested in any Listed “B” building, structure, site or land shall—

Gibraltar Heritage Trust

- (a) make to that building, structure, site or land any alterations, addition, or repair that affects its archaeological, architectural, artistic, historical or vernacular character; or
- (b) fell any tree on the land on which the Listed “B” building or structure is situated,

except in accordance with a permit in writing issued for that purpose by the Government acting after consultation with the Board.

Offences.

50. (1) A person who contravenes any provision of any of sections 23(1), 24(1), 27, 31(1), 33, 39 or 49 or who contravenes any order made under section 32 is guilty of an offence against this Act, and is liable on summary conviction to imprisonment for a term of 3 months or to a fine at level 3 on the standard scale.

(2) Any information for an alleged offence against this Act may be sworn by any trustee.

(3) In any proceedings for an alleged offence against this Act, any trustee or the Curator may appear and conduct the proceedings on behalf of the informant.

Regulations by the Government.

51. The Government may from time to time make regulations for all or any of the following purposes—

- (a) prescribing the procedure to be followed on any application under this Act, the forms to be used in such applications, and fees that shall be payable to the Trust on making such applications;
- (b) prescribing fees in respect of any matters under this Act;
- (c) regulating conduct in the Museum and providing that a contravention of any such regulation shall constitute a criminal offence, and providing for a penalty not exceeding £100 in respect of any such offence;
- (d) providing for such other matters as are reasonably necessary for or incidental to the due administration of this Act.

Transfer of assets and liabilities.

52. All assets and liabilities of the Gibraltar Heritage Trust established under the Gibraltar Heritage Trust Act 1987 and any funds of the Museum Committee established under the Gibraltar Museum and Antiquities Act, are hereby transferred to the Trust.

Repeals.

Section 53 repeals the Gibraltar Heritage Trust Act, 1987 and the Gibraltar Museum and Antiquities Act.

Gibraltar Heritage Trust

SCHEDULE 1

Section 34

LISTED BUILDINGS ETC., CATEGORY 'A'.

(Reference: Map Sheet Gibraltar 1:5,000 Series M984. Ancient Monuments which are the property of the Crown in right of its Government in Gibraltar. An annotated reference copy of the map is held by Curator, Gibraltar Museum).

<i>Description</i>	<i>Location</i>	<i>Grid Reference</i>
1. THE LINE OF FORTIFICATIONS FACING NORTH AND WEST AND COVERING GIBRALTAR BAY AND HARBOUR, COMPRISING—		
Hesse's Demi Bastion	North corner of Moorish Castle	8860 0281
Landport Gate	North East corner Grand Casemates Square	8855 0282
Grand Battery	North East Side	884028
	Grand Casemates	885028
North Bastion	Bounded by Smith Dorrien Avenue and Corral Road	884029
Casemates Curtain including Casemates Gates Waterport	Western entrance to Grand Casemates Square	8841 0284
Montagu Bastion	Bounded by Line Wall Road and Fish Market Road	883027
Chatham Counterguard including Chatham Wicket	East side Queensway from Waterport Fountain to American War Memorial	88290286
West Place of Arms	Corral Road	88450297
Old Mole Head	North West of Devil's Tongue Battery	88160302
Devil's Tongue Battery	South side Old Mole, Waterport Wharf	882029

Montagu Curtain including Boyd's Gate	East of Fish Market Road	88300272
Orange Bastion	West of Line Wall Road	88270265
Prince Albert's Front, including Main Sally Ports and Zoca Flank	West of Line Wall Road from American War Memorial to Zoca	882025– 882024
Line Wall Road to King's Bastion	Line Wall Road	88230240– 88230231
King's Bastion including one 12.5–38 ton Gun and four 10in–18 ton Guns	Electricity Generating Station between Queensway and Line Wall Road	881022
Wellington Front	East of RN Hockey Ground	882021– 882020
Line Wall Curtain to Wellington Front	West of Line Wall Road and Convent	882019– 882018
Line Wall Curtain to South Bastion	West of Line Wall Road and John Mackintosh Hall	88290181– 88320173
South Bastion	West of Southport Gate	883016
Ragged Staff Gates	By Dockyard North Gate	88310156
Ragged Staff Flank	East of Gates	883015
Curtain to North Jumpers Bastion	West of Rosia Road	883014– 883013
North Jumpers Bastion	– “ –	883012
Curtain to South Jumpers Bastion	– “ –	884011– 84010
South Jumpers Bastion	– “ –	884009
Curtain Walls to Alexandra Battery	West of Rosia Road	88450095–
	New Mole Parade and West from Dockyard South Gate	88120058
Defensive Walls of Prince William and Engineer Battery	South end of South Mole –”–	881005– 882004 883601
100 ton gun to include the two loading rammer chambers	Napier of Magdalla Battery North side of Rosia Bay	882003

2. DEFENCES COVERING EUROPA COMPRISING–

Machicouli Gallery	Above Camp Bay	88500001
Defensive wall from Parsons Lodge to Buena Vista Barracks	West Side of Buena Vista Parade Ground	886998
Buena Vista Battery	West side of Buena Vista	88619980

Gibraltar Heritage Trust

Stone tower with spiral staircase	Parade Ground Behind (East) 2 nd Europa Pass Battery	88789968
Prince George's Battery	Top of cliff on South side of Little Bay	88659939
Defensive wall along whole Europa cliff edge	From Prince George's Battery round Europa Point to car chute at Europa Battery	861991
Derrick Crane		88809893
2 nd and 3 rd Europa Advance Batteries	East of Europa Advance Road	893998
1 st Europa Advance Battery	East of Europa Advance Road	893997

3. LOWER CHARLES V WALL FROM SOUTH BASTION RUNNING EAST AND INCLUDING—

Southport Gates, including 10in. RML 18 ton gun	Bottom of Trafalgar Hill	88400169
Prince Edward's Gate and two guardhouses	Prince Edward's Road	88490169
St. Jago's Bastion	Above and East of Trafalgar Cemetery	885016
Flat Bastion Magazine	Above Gardiners Road	88560168
Flat Bastion	Below Green Lane	88640165

4. MOORISH WALL INCLUDING—

Old Guard House	From above Green Lane to Signal Hill	88660164– 89010155
Signal Station	North of Wall Signal Hill	88890164 89040155

5. UPPER CHARLES V WALL INCLUDING—

Queens Gate and Healy's mortar	Old Queen's Road	88760136
Middle Gate	Middle Road	88910135
St. Michael's Gate	St. Michael's Road	89030134
Prince Ferdinand's Battery	Apes Den	887013

6. NORTH FRONT DEFENCES—

King Lines including	North West face of Rock	88650282– 88750291
Couvreport Battery		88580286

Bombproof Battery		88660280
King Lines Battery		
Hanover Battery		
Underground systems		88630277
comprising:–		
Bombproof Gallery		
Hanover Gallery		
King’s Gallery		
Star Chamber		
St. Patrick’s Chamber		
Common’s Hall		
Orillon		
Queen’s Lines, including:–	North East of Kings Lines	88780292–
	overlooking Laguna	88940302
	Estate	
Lower Forbes Battery		88940302
Underground systems		
comprising:–		
Smart’s Well Reserve		
Queen’s Gallery		
Queen’s Line Gallery		
Queen’s Advance Gallery		
Raleigh Gallery		
Princess Lines including:	Above King’s & Queen’s	88640275–
	Lines	88980302
Lower Union		8864027–
Communication		8800283
Bomb Proof Magazine		88870292
Bombproof Barracks		88900295
Upper Forbes Battery		
Forbes Lookout		88980299
Upper All’s Well		89000298
Underground systems		
comprising:–		
Castle Communication		88620275
Princess Gallery	North Part of Rock,	
	overlooking Eastern	
	Beach	
Ramp to Star Chamber		
Upper Galleries		89130280
Middle Galleries		
Lower Galleries		

7. UPPER ROCK BATTERIES COMPRISING–

Gibraltar Heritage Trust

Princess Caroline's Battery with 64 pr RML gun	North end of Queen's Road	88860274
Princess Amelia's Battery including four 5.25 in. Heavy anti-aircraft guns	-- " --	88960286
Princess Royal Battery		89040292
Farrington's Battery	North of Rock, above Princess Batteries	89050284
Upper Gallery entrance and bastion including 64 pr gun	Top of Upper Galleries Road	89130281
Green Lodge (or Superior) Battery	North Upper Rock	89260279
Lord Airey's Battery	O'Hara's Road	89230055
O'Hara's Battery including the complete 9.2 in gun magazines engine room and associated works and spare barrel	O'Hara's Point Upper Rock	89250044
Series of rings along O'Hara's road for hauling guns	O'Hara's Road	891006-- 891008

8. MOORISH CASTLE COMPLEX INCLUDING--

The Tower of Homage	North east of Town	88690268
The Inner Keep and Blind Arches		
The Outer Walls, Towers and Gate House		88590261

9. QUEENS ROAD BATTERIES--

Rooke Battery	Royal Anglian Way Off Willis' Road	88840099
Hayne's Cave Battery and 4 in. Shoulder Shield QF gun	-- " --	88840121
Willis' magazine	Off Willis' Road	88800253
Devil's Gap Battery including two 6in BL guns	Below Old Queen's	88630192

9A. DEFENSIBLE
BARRACKS--

Devils Bellow	Gateway from Windmill	88969988
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Hole in the Wall Gate	Hill Road South end of Hole in the Wall Road leading from Windmill Hill to Europa Advance Road	89189978
Hole in the Wall Battery	East of the Hole in the Wall	89219976

10. UPPER ROCK MONUMENTS AND ANTIQUITIES–

Advance Look out Post– Moorish with stone conical roof	North of Mount Misery	89090115
Old Lime Kiln	East of Willis' Road	88830262
Mrs Chetwynds Chair	Rock cut seat near Governor's Lodge	89190018
Mediterranean Road Jews Cemetery	South East of junction Queen's Road/Engineer Road	890000

11. CAVES OF ARCHAEOLOGICAL INTEREST–

Upper St Michael's Cave System	Entrance off St. Michaels Road	890007
Remains of Forbes Quarry Cave (site of first Neanderthal skull find)	Off Devil's Tower Road	89040302
Devils Tower Cave– Mousterian Shelter (skull of Neanderthal child found)	Off junction Devils' Tower Road/Eastern Beach Road	89410278
Devil's Fall Cave– Prehistoric Shelter	In cliff face between Camp Bay and Little Bay	88619976
St. Michael's Cave, Lower Series	Entrance tunnel below Spur Battery Road	890006
New St. Michael's Cave	“_“	890006
Martin's Cave, Palaeolithic occupation site. Also Neolithic and Medieval site	Off Mediterranean Steps	89370036
Gorham's Cave, Palaeolithic occupation site. Also Neolithic and Phoenician / Carthaginian site	Governor's Beach	89320003
Judge's Cave – Neolithic Shelter	Glen Rocky North Gorge	88759983

Gibraltar Heritage Trust

Genista Cave Stone – Late Neolithic dwelling site	Site marked by stone tablet outside Eastern entrance to QM Block at Lathbury Barracks	88969975
Goat's Hair Twin Caves, Palaeolithic occupation site. Also Neolithic site	Off Mediterranean Steps	89320031
Vanguard Cave, Palaeolithic occupation site	Governor's Beach	89330001
Hyaena Cave, Palaeontological site	Governor's Beach	8933900017
Bennett's Cave, Palaeolithic site.	Governor's Beach	89310001
Ibex Cave, Palaeolithic site	East side sand dune	88950016
Sewell's Cave, Palaeolithic site	East cliffs	88980011
Mammoth Cave, Neolithic site	East cliffs	89080014
Collin's Cave, Neolithic site	East cliffs	89330086
Holyboys' Cave, Archaeological site	East cliffs	88970011
Fig Tree Cave No.2, Archaeological site	Off Mediterranean Steps	89360031

12. OTHER MONUMENTS AND ANTIQUITIES–

Shrine of Our Lady of Europa and Moorish paving	By St Christopher's School	88749906
Aqueduct: underground from Governor's Meadow Estate to John Mackintosh Square	To include 4th vent Tower on Rosia Road and Fountain on south side of Zoca Flank	88390136 88230241
Spanish Bronze Cannon	Waterport entrance	88340286
One 6prd Coast Defence on pivot mount	Stone Block, Gibraltar Regiment Barracks	000649975
One Koehler Depressing Gun	Grand Casemates Square	00410278
Trafalgar Cemetery	Trafalgar Hill	884016
2 Caronede 18 prd	City Mill Lane	88370233
1 Caronede 8 prd	Hargrave Square	88480175
1 Caronede 8 prd	George's Lane–Town Range	88440208
Cannon position including pivot of 32prd sliding traversing Carriage	Site of Hospital Battery Northern section	88580238
Court of Orange Trees with Spanish Coat of Arms	North East corner of Cathedral of St Mary the Crowned	883022

Spanish Fountain	Prince Albert's Front	88230241
Queen Victoria Memorial	Governor's Parade	00430217
Two 6 prd BL guns	Europa Point	88939886
Two Russian Crimean Cannons presented to Gibraltar	By Retrenchment Block	890998
Two Russian Crimean Cannons presented to Gibraltar	By Line Wall War Memorial	88230235– 88230233
Natural Spring and well	East Rosia Parade	88590031
Nuns' Well Europa	South of Keightley Way Tunnel entrance	88989907
One 6pr Coast Defence on pivot mount	Fortress Headquarters	88330035
Small Rock cut seat	Upper Rock, near top of Mediterranean Steps	89250055
Entrance to Victualling Yard	South Rosia Parade	88450014
Plaque on site of Devil's Tower	North Front	89470292

13. ALAMEDA GARDENS–

Two 10 in. 18 ton rifled muzzle loaders	Car Park, Grand Parade	88510148
Elliot's Monument including one 8in. and three 10 in. howitzer barrels		
Wellington Monument including a 1758 18 pr cannon and carriage and two 13 in. mortars and shot		88560116
Tomb of Bridget McFarlane	South of Glorietta, East of Wellingtons Monument	88590116

Ancient Monuments which
are the property of the
Crown in right of its
Government in the United
Kingdom.

1A. THE LINE OF FORTIFICATIONS FACING NORTH AND WEST
AND COVERING GIBRALTAR BAY AND HARBOUR,
COMPRISING–

Rosia Bay Defensive Wall and batteries including	East side of Rosia Bay	883002
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two 64pr rifled muzzle
loading guns.

SCHEDULE 2

Section 40

LISTED BUILDINGS ETC., CATEGORY 'B'.

(Reference: Map Sheet Gibraltar
1:5,000 Series M984

An annotated reference copy of
the map is held by Curator,
Gibraltar Museum).

<i>Description</i>	<i>Location</i>	<i>Grid Reference</i>
Church Doorways	St Jagos Barracks	884017
	Convent Stables	883019
The Convent	Main Street	883019
Court House	Main Street	88400197
Exchange Building, Gibraltar Parliament	John Mackintosh Square	88340234
Moorish Bath	Bomb House Lane	88260214
Garrison Library and Gardens	East of Governor's Parade	88460214
Cathedral Church of St Mary the Crowned	Main Street	8830022
Synagogue	Engineer Lane	88450246

Gibraltar Heritage Trust

SCHEDULE 3

CLASSES OF MEMBERSHIP.

(1) The members of the Trust shall be divided into the following classes—

- (a) ordinary subscribing members;
- (b) life members;
- (c) benefactors;
- (d) corporate members;
- (e) junior members;
- (f) family members;
- (g) such other classes as the Board may from time to time by resolution determine.

(2) Ordinary subscribing members shall be annual subscribers to the funds of the Trust of such minimum annual subscription as may from time to time be fixed by a resolution of the Board.

(3) Life members shall be persons who have made to the funds of the Trust a subscription of not less than a minimum amount fixed by a resolution of the Board as at the time when the subscription was made.

(4) Benefactors shall be persons who have given to the Trust such sum of money or other property as, in the opinion of the Board, is such as to entitle such persons to be distinguished as benefactors.

(5) Corporate members shall be corporate or other bodies or associations who may have made annual subscriptions to the funds of the Trust of such minimum amount as the Board may by resolution from time to time fix, and different minimum annual subscriptions may from time to time be fixed for different classes of corporate members.

(6) Junior members shall be annual subscribers to the funds of the Trust as such minimum annual subscription and of such an age as the Board may from time to time by resolution fix.

(7) Family members shall be persons who are members of the family of an ordinary subscribing member who make to the funds of the Trust an

annual subscription of such minimum amount as the Board may from time to time by resolution fix.

Endangered Species Act 1990

ENDANGERED SPECIES ACT**Principal Act**

Act. No. 1990-54	<i>Commencement</i>	23.5.1991
	<i>Assent</i>	22.11.1990

Amending enactments	Relevant current provisions	Commencement date
Act. 1991-33	s.2(4)(a)	12.12.1991
LN. 1993/113	Schs. 1, 2 and 4	1.7.1993
Act. 1998-11	Sch. 1	29.1.1998
2007-17	ss. 4(1), 4(3), 5(1), 8	14.6.2007

EU Legislation/International Agreements involved:

Regulation (EC) No. 338/97

Regulation (EC) No. 939/97

English sources:

None

1990-54

Endangered Species

ARRANGEMENT OF SECTIONS.

Section

1. Title and commencement.
2. Restriction on the importation and exportation of certain animals and plants.
3. Prohibition on sales, etc.
4. Scientific authorities.
5. Amendment and interpretation of Schedules.
6. Restriction of movement of certain live animals after importation.
7. Offences by corporations.
8. Regulations.
9. Repeal.

SCHEDULE 1.

Animals etc., the importation, exportation and sale of which is restricted.

SCHEDULE 2.

Plants, the importation, exportation and sale of which are restricted.

SCHEDULE 3.

Items the importation and exportation of which are restricted.

SCHEDULE 4.

Interpretation of Schedules 1 and 2.

1990-54

Endangered Species

AN ACT TO CONTROL THE IMPORT INTO, THE EXPORT FROM
AND THE SALE IN GIBRALTAR OF ENDANGERED SPECIES.

Title and commencement.

1. This Act may be cited as the Endangered Species Act, 1990, and shall come into force on a date to be appointed by the Governor by notice in the Gazette and different dates may be so appointed for different purposes.

Restriction on the importation and exportation of certain animals and plants.

2.(1) Subject to subsection (2) the importation and the exportation of the following things are prohibited—

- (a) any animal or plant, whether alive or dead, of the species listed in the first and second Schedules to this Act, and any part of or products of such animals or plants together with the parts or products listed in the third Schedule;
- (b) any other goods which appear from—
 - (i) an accompanying document;
 - (ii) their packaging;
 - (iii) a mark or label; or
 - (iv) any other circumstances,

to be parts or derivatives of animals or plants listed in Schedules 1 or 2.

(2) Subsection (1) shall not apply to the importation or exportation of any thing under and in accordance with the terms of a licence issued by the Collector of Customs.

(3) A licence issued under subsection (2) may be—

- (a) to any degree general or specific;
- (b) expressed to be valid for such period as may be stated in the licence;
- (c) modified or revoked at any time by the Collector of Customs;

1990-54

Endangered Species

(d) subject to such conditions as may be therein specified.

(4) The Collector of Customs shall not issue a licence under subsection (2) unless he is satisfied in relation to the thing in respect of which the application for such licence has been made that—

(a) it is not listed in column 1 of Schedule 1:

Provided that the Collector of Customs may issue a licence under subsection (2) in relation to a thing listed in column 1 of Schedule 1 where—

- (i) he is satisfied that the importation or exportation is for the purpose of scientific study;
 - (ii) the issuing of such licence has been approved by the body established under section 4; and
 - (iii) the licence specifies the precise thing and occasion of importation, and is not a general licence;
- (b) the capture or collection of the specimen in the wild did not or will not have a harmful effect on the conservation of its species or on the extent of the territory occupied by the population of the species to which the thing belongs;
- (c) the competent authorities of the country of origin of the thing have provided documentary evidence that the particular specimen has been obtained in accordance with the legislation there operating on protection of the species in question;
- (d) in the case of the importation of a living animal, the intended recipient possesses adequate facilities suitable for accommodating the specimen and suited to its behaviour and that the animal will be properly cared for;
- (e) there are no other requirements relating to the conservation of the species to which the thing belongs which militate against the issuing of a licence; and

the Collector of Customs shall seek the advice of the body established under section 4 in relation to the matters contained in paragraphs (a) to (e) of this subsection.

(5) A person who, for the purpose of obtaining, whether for himself or another, the issue of a licence under subsection (2)—

- (a) makes a statement which he knows to be false in a material particular:
- (b) furnishes a document or information which he knows to be false in a material particular; or
- (c) recklessly makes a statement which is false in a material particular,

is guilty of an offence and is liable on summary conviction to a fine of £5,000 or on conviction on indictment to imprisonment for two years and to a fine.

(6) Where a licence is issued under subsection (2) and, for the purpose of obtaining its issue, a person commits an offence under subsection (5), the licence shall be void.

(7) Where—

- (a) any live or dead animal or plant;
- (b) any thing specified in Schedule 3; or
- (c) any thing falling within section 2(1)(b),

is being imported or exported or has been imported or brought to any place for the purpose of being exported any officer authorised by the Collector of Customs may require any person possessing or having control of the animal, plant or thing to furnish proof that its importation or exportation is or was not unlawful by virtue of this section and if such proof is not furnished to the satisfaction of the officer, the animal, plant or thing shall be liable to forfeiture under the Imports and Exports Act¹.

Prohibition on sales, etc.

3.(1) Subject to subsection (2) it shall be an offence to—

- (a) keep for sale;
- (b) display for sale;
- (c) offer for sale;
- (d) sell; or
- (e) transport for sale,

¹ 1986-21

1990-54

Endangered Species

anything referred to in section 2(1).

(2) Where the Collector of Customs is satisfied, having taken the advice of the scientific authority, that the thing kept displayed or offered for sale, or sold or transported for sale is—

- (a) a specimen bred in captivity or artificially propagated or is a part of an animal or plant so bred or propagated or is derived therefrom; and
- (b) the thing is intended for research, teaching, breeding or propagation purposes,

he may grant a certificate permitting the keeping, displaying or offering for sale, sale or transporting of that thing.

(3) Any person convicted of an offence under subsection (1) shall be liable on summary conviction to a fine of £5,000.

Scientific authorities.

4.(1) The Government may—

- (a) establish any body or bodies, consisting in each case of such members as he may from time to time appoint;
- (b) assign to any other body or bodies the duty referred to in subsection (3).

(2) A reference in this Act to a scientific authority is a reference to a body which is established under subsection (1) or to which the duty there referred to is assigned under that subsection.

(3) It shall be the duty of a scientific authority to carry out any duties assigned to it by this Act to advise the Government on any question which he may refer to it, and on any question on which he considers it should offer its advice—

- (a) in connection with the administration of this Act;
- (b) generally in connection with the importation, exportation and sale of animals and plants of kinds which appear to him, or as the case may be, the authority to be endangered and things derived wholly or partly from animals and plants of those kinds.

Amendment and interpretation of Schedules.

5.(1) Where, after consulting the scientific authority, the Government decides—

- (a) that the importation, exportation or sale of any animal or plant of a particular kind or of any thing derived wholly or partly from any animal or plant of a particular kind, should be restricted because it appears to him that the kind of animal or plant concerned is endangered or that the danger to the kind concerned has increased; or
- (b) that the importation, exportation or sale of any animal or plant of a particular kind or of any thing derived wholly or partly from any animal or plant of a particular kind, should no longer be restricted because it appears to him that the kind of animal or plant concerned is no longer endangered or that the danger to the kind concerned has decreased,

he may, by Order, make such modification to any Schedule as he considers necessary or desirable to give effect to that decision.

(2) Any Order under this section may be varied or revoked by a subsequent Order thereunder.

(3) Schedules 1 and 2 shall be interpreted in accordance with the provisions of Schedule 4.

Restriction of movement of certain live animals after importation.

6.(1) Where a licence under section 2(2) has been issued or applied for in respect of the importation of a live animal of any of the kinds for the time being specified in the second column of Schedule 1, and after consulting the scientific authority the Collector of Customs considers that it is desirable to give a direction under this section, he may direct that the animal immediately after—

- (a) being imported; or
- (b) undergoing any period of quarantine required by any provision made by or under any legislation,

shall be taken to and subsequently kept at such premises as may be specified in the direction until such time as the Collector of Customs may give permission for the animal to be moved from those premises.

(2) A person who, knowing that a direction under subsection (1) has been given in relation to an animal—

1990-54

Endangered Species

- (a) knowingly takes it, or knowingly permits it to be taken, after it has been imported, to premises other than–
 - (i) the premises specified in the direction;
 - (ii) the premises connected with the importation of the animal; or
 - (iii) the premises where the animal is to undergo any period of quarantine required by any provision made by or under any legislation; or
- (b) knowingly moves it or knowingly permits it to be moved from the premises specified in the direction in the absence of such permission as is mentioned in subsection (1),

is guilty of an offence and is liable on summary conviction to a fine of £5,000.

(3) Proceedings for an offence under subsection (2) may be brought within a period of six months from the date on which evidence that is sufficient in the opinion of the Attorney General to warrant the proceedings came to his knowledge; but no such proceedings shall be brought by virtue of this section more than three years after the commission of the offence.

- (4) For the purposes of subsection (3)–
 - (a) a certificate signed by or on behalf of the Attorney-General and stating the date on which such evidence came to his knowledge, shall be conclusive evidence of that fact; and
 - (b) a certificate stating that matter and purporting to be so signed, shall be deemed to be so signed unless the contrary is proved.

Offences by corporations.

7. Where an offence under this Act which has been committed by a body corporate is proved to have been committed with the consent or connivance of, or to be attributable to any neglect on the part of, a director, manager, secretary or other similar officer of a body corporate, or any person who is purporting to act in any such capacity, he, as well as the body corporate, is guilty of that offence and is liable to be proceeded against and punished accordingly.

Regulations.

8. The Government may make regulations for the purpose of carrying into effect the provisions of this Act and in particular but without prejudice to the generality of the foregoing for the following purposes—

- (a) prescribing the form of application for a licence and the form of that licence to be issued under section 2(2);
- (b) prescribing the fees payable in connection with the application for a licence and any licence under the Act;
- (c) prescribing the fees payable in connection with the application for the granting of any licence under section 2(2);
- (d) prescribing the form of evidence to be presented in support of any application for a licence under section 2(2);
- (e) providing for such other matters as are reasonably necessary for or incidental to the due administration of this Act.

Section 9 repeals the Endangered Species (Import and Export) Act.

1990-54

Endangered Species

SCHEDULE 1

Sections 2 & 3

Animals etc., the importation, exportation and sale of which is restricted.

PART 1

<p><i>AVES</i> (Birds) <i>Phalacrocoracidae</i></p>	<p><i>Phalacrocorax aristotelis desmatestii</i> (Western Mediterranean Shag)</p>
<p><i>Galliformes</i></p>	<p><i>Alectoris barbara</i> (Barbary Partridge) <i>Alectoris rufa</i> Red-legged Partridge</p>
<p><i>TESTUDINATA</i> (tortoises, etc) <i>Testudinidae</i></p>	<p><i>Testudo spp.</i> (Land tortoises) <i>Emys orbicularis</i> (European Pond Terrapin) <i>Mauremys caspica</i> (Stripe-necked Terrapin)</p>
<p><i>SAURIA</i> (LIZARDS) <i>Gekkonidae</i></p>	<p><i>Tarentola Mauritanica</i> (Moorish Gecko) <i>Hemidactylus turcicus</i> (Turkish Gecko)</p>
<p><i>Lacertidae</i></p>	<p><i>Podarcis hispanica</i> (Iberian Wall Lizard) <i>Acanthodactylus erythrurus</i> (Spiny-footed Lizard)</p>
<p><i>Scincidae</i></p>	<p><i>Chalcides chalcides</i> (Three-toed Skink) <i>Chalcides bedriagai</i> (Bedriaga's Skink)</p>
<p><i>SERPENTES</i> (SNAKES) <i>Colubridae</i></p>	<p><i>Coluber hippocrepis</i> (Horseshore Whip Snake) <i>Natrix natrix</i> (Grass Snake) <i>Natrix maura</i> (Viperine Snake)</p>
<p><i>PISCES</i> (FISH)</p>	<p><i>Hippocampus spp.</i></p>

	(Seahorses)
	<i>Syngnathus spp.</i>
	(Pipefish)
	<i>Thalassoma spp.</i>
	(Turkish Wrasse)
	<i>Blennius spp.</i>
	(Blennies)
	<i>Gobius spp.</i>
	(Gobies)
	<i>Chromogobius spp.</i>
	(Gobies)
	<i>Thorogobius spp.</i> (Gobies)
ARACHNIDA (SPIDERS)	<i>Macrothele calpeiana</i>
<i>Dipluridae</i>	(Gibraltar Funnel-web Spider)
CRUSTACEA (CRUSTACEANS)	<i>Lepas anatifera</i>
	(Goose Barnacle)
	<i>Maja spp.</i>
	(Spider Crabs)
MOLLUSCA (MOLLUSCS)	<i>Atrina pectinata</i>
<i>Gastropoda</i>	(Brittle Pen Shell)
	<i>Pinna nobilis</i>
	(Noble Pen Shell)
	<i>Pinna rudis</i>
	(Rough Pen Shell)
	<i>Patella ferruginea</i>
	(Ribbed Mediterranean Limpet)
	<i>Acicula norrisi</i>
	<i>Thais haemastoma</i>
	(Rock Shell)
	<i>Lithophaga lithophaga</i>
	(Date mussel)
	<i>Charonia spp.</i>
	(tritons)
	<i>Epitonium spp.</i>
	(wentletraps)
	<i>Trivia spp.</i>
	(cowries)
	<i>Cypraea spp.</i>
	(cowries)
	<i>Mitra zonata</i>
	(Zoned Mitre Shell)
	<i>Cymbium olla</i>
	<i>Bolinus brandaris</i>
	(Purple Dye Murex)
	<i>Hexaplex trunculus</i>

1990-54

Endangered Species

	(Banded Murex) <i>Osteophora calpeana</i> <i>Cecilioides spp.</i>
<i>Opithobranchia</i> (sea slugs, etc.)	All species
<i>Cephalopoda</i>	<i>Argonauta argo</i> (Paper Nautilus) <i>Eledone spp.</i> (Lesser Octopus)
ANTHOZOA (ANEMONES, CORALS, Etc.) <i>Madreporaria</i>	<i>Balanophyllia regia</i> (Regal Coral) <i>Cladocora cespitosa</i> (Carpet Coral) <i>Dendrophyllia ramea</i> (Yellow Coral) <i>Lophelia pertusa</i> (coral) <i>Leptosammia pruroti</i> (Yellow Cup Coral) <i>Astroides calyculari</i> (Star Coral)
<i>Alcyonacea</i>	<i>Alcyonium palmatum</i> (Deadman's Fingers) <i>Parerythropodium coralloides</i> (soft coral)
<i>Gorgonacea</i>	<i>Eunicella cavolinii</i> (Yellow Gorgonian) <i>Eunicella clavata</i> (Violet Sea Whip) <i>Eunicella singularis</i> (gorgonian) <i>Eunicella verrucosa</i> (White Gorgonian) <i>Corallium rubrum</i> (Red Coral)

PART 2

Plants, the importation and exportation of which is restricted.

CARYOPHYLLACEAE	<i>Silene tomentosa</i> (Gibraltar Campion)
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SCHEDULE 2

Section 2(1)

Plants, the importation, exportation and sale of which are restricted.

FLORA

AGAVACEAE

Agave arizonica

Agave parviflora

Agave victoriae-reginae ≠ 1

Nolina interrata

AMARYLLIDACEAE

Galanthus spp. ≠ 1

Sternbergia spp. ≠ 1

APOCYNACEAE

Pachypodium spp.

≠ 1

Pachypodium baronii

Pachypodium brevicaule

Pachypodium decaryi

Pachypodium

namaquanum

Rauvolfia serpentina ≠ 2

ARACEAE

Alocasia sandariana

ARALIACEAE

Panax quinquefolius

ARAUCARIACEAE

Araucaria araucana +

Araucaria araucana –

216

117 ≠ 1

ASCLEPIADACEAE

Ceropegia spp. ≠ 1

Frerea indica ≠ 1

BERBERIDACEAE

Podophyllum

hexandrum = 363 ≠ 2

BROMELIACEAE

Tillandsia harissi

Tillandsia kammii

Tillandsia kautskyi

Tillandsia mauriana

Tillandsia sprengeliana

Tillandsia sucrei

Tillandsia

xerographica

BYBLIDACEAE

Byblis spp. ≠ 1

CACTACEAE

CACTACEAE spp ≠ 4

1990-54

Endangered Species

- Ancistrocactus*
tobuschii = 364
Ariocarpus spp.
Astrophytum asterias =
 365
Aztekium ritteri
Backebergia militaris
 = 366
Coryphantha minima =
 367
Coryphantha sneedii =
 367
Coryphantha
werdetmannii
Discocactus spp.
Echinocereus
ferreirianus var.
lindsayi = 368
Echinocereus schmollii
 = 369
Echinomastus
erectocentrus = 370
Echinomastus
mariposensis = 370
Leuchtenbergia
principis
Mammillaria
pectinifera = 371
Mammillaria plumosa
Mammillaria
solisioides
Melocactus conoidas
Melocactus
deinacanthus
Melocactus
glaucescens
Melocactus
pausispinus
Nopalxochia
macdougallii = 372
Obregonia denegrii
Pediocactus bradyi
Pediocactus despainii
Pediocactus knowltonii
Pediocactus
papyracanthus = 364
Pediocactus paradinei
Pediocactus

	<i>peeblesianus</i>	
	<i>Pediocactus sileri</i>	
	<i>Pediocactus winkleri</i>	
	<i>Pelecyphora</i> spp.	
	<i>Sclerocactus glaucus</i>	
	<i>Sclerocactus mesae-</i> <i>verdae</i>	
	<i>Sclerocactus</i> <i>pubispinus</i>	
	<i>Sclerocactus wrightiae</i>	
	<i>Strombocactus</i> <i>disciformis</i>	
	<i>Turbinicarpus</i> spp. = 373	
	<i>Turbinicarpus</i> <i>valdezianus</i> = 373	
	<i>Uebelmannia</i> spp.	
CARYOCARACEAE		<i>Caryocar costaricense</i> ≠ 1
CEPHALOTACEAE		<i>Cephalotus follicularis</i> ≠ 1
COMPOSITAE (ASTERACEAE)	<i>Saussurea costus</i> = 374	
CRASSULACEAE	<i>Dudleya stolonifera</i> <i>Dudleya traskiae</i>	
CUPRESSACEAE	<i>Fitz-Roya cupressoides</i> <i>Pilgerodendron</i> <i>uviferum</i>	
CYATHEACEAE		CYATHEACEAE spp. ≠ 1
CYCADACEAE		CYCADACEAE spp. ≠ 1
	<i>Cycas beddomei</i>	
DIAPENSIACEAE		<i>Shortia galacifolia</i> ≠ 1
DICKSONIAEACEAE		DICKSONIAEACEAE spp. ≠ 1
DIDIEREACEAE		DIDIEREACEAE spp. ≠ 1
DIOSCOREACEAE		<i>Dioscorea deltoidea</i> ≠ 1
DROSERACEAE		<i>Dionenia muscipula</i>
ERICACEAE		<i>Kalmia cuneata</i> ≠
EUPHORBIACEAE		<i>Euphorbia</i> spp. – 118 ≠ 1
	<i>Euphorbia</i> <i>ambovombensis</i> <i>Euphorbia cylindrifolia</i> <i>Euphorbia decaryi</i>	

1990-54

Endangered Species

	<i>Euphorbia francoisii</i>	
	<i>Euphorbia moratii</i>	
	<i>Euphorbia</i>	
	<i>parvicyathophora</i>	
	<i>Euphorbia primulifolia</i>	
	<i>Euphorbia</i>	
	<i>quartziticola</i>	
	<i>Euphorbia tulearensis</i>	
FAGACEAE		
FOUQUIERIAACEAE		<i>Fouquieria columnarsi</i> ≠ 1
	<i>Fouquieria fasciculata</i>	
	<i>Fouquieria purpusii</i>	
GNETACEAE		<i>Gnetum montanum</i> (Nepal) ≠ 1
JUGLANDACEAE		<i>Oreomunnea</i> <i>pterocarpa</i> = 375
LEGUMINOSAE (FABACEAE)	<i>Delbergia nigra</i>	<i>Pericopsia elata</i> <i>Platymiscium</i> <i>pleiostachyum</i> ≠ 1
LILIACEAE		<i>Aloe</i> spp. ≠ 5
	<i>Aloe albida</i>	
	<i>Aloe pillansii</i>	
	<i>Aloe polyphylla</i>	
	<i>Aloe thorncroftii</i>	
	<i>Aloe vossii</i>	
MAGNOLIACEAE		<i>Talauma hodgsonii</i> (Nepal)
MELIACEAE		<i>Swietenia humilis</i> ≠ 1 <i>Swietenia mahagoni</i> ≠ 1
MORACEAE		<i>Batocarpus</i> <i>costaricensis</i> ≠ 1
NEPENTHACEAE		<i>Nepenthes</i> spp. ≠ 1
	<i>Nepenthes khasiana</i>	
	<i>Nepenthes rajah</i>	
ORCHIDACEAE		ORCHIDACEAE spp. = 376 ≠ 6
	<i>Cattleya skinneri</i>	
	<i>Cattleya trianae</i>	
	<i>Didiciea cinninghamii</i>	
	<i>Laelia jongheana</i>	
	<i>Laelia lobata</i>	
	<i>Lycaste skinneri</i> var <i>alba</i> = 377	
	<i>Paphiopedilum</i> spp.	
	<i>Peristeria elata</i>	

	<i>Phargmipedium</i> spp.	
	<i>Renanthera</i>	
	<i>imschootiana</i>	
	<i>Vanda coerulea</i>	
PALMAE (ARECACEAE)		<i>Chrysalidocarpus</i> <i>decipiens</i> ≠ 1
		<i>Neodypsis decaryi</i> ≠ 1
PAPAVERACEAE		<i>Meconopsis regla</i> (Nepal) ≠
PINACEAE	<i>Abies guatemalensis</i>	
PODOCARPACEAE	<i>Podocarpus parlatorei</i>	<i>Podocarpus neriifolius</i> (Nepal) ≠ 1
PORTULACAEAE		<i>Anacampseros</i> spp. ≠ 1
		<i>Lewisia cotyledon</i> ≠ 1
		<i>Lewisia maguirei</i> ≠ 1
		<i>Lewisia serrata</i> ≠ 1
		<i>Lewisia tweedyi</i> ≠ 1
PRIMULACEAE		<i>Cyclamen</i> spp. ≠ 1
PROTEACEAE	<i>Orothamnus zeyheri</i>	
	<i>Protea odorata</i>	
RUBIACEAE	<i>Balmea stormiae</i>	
SARRACENIACEAE		<i>Darlington californica</i> ≠ 1
		<i>Sarracenia</i> spp. ≠ 1
	<i>Sarracenia</i>	
	<i>alabamensis</i>	
	<i>alabamensis</i> = 378	
	<i>Sarracenia jonesii</i> = 379	
	<i>Sarracenia oreophila</i>	
STANGERIACEAE	<i>Stangeria eriopus</i> = 380	
TETRACENTRACEAE		<i>Tetracentron sinense</i> (Nepal) ≠ 1
THEACEAE		<i>Camellia chrysantha</i> ≠ 1
WELWITSCHIAEAE		<i>Welwitschia mirabilis</i> = 381 ≠ 1
ZAMIACEAE		ZAMIACEAE spp. ≠ 1
	<i>Ceratozamia</i> spp.	
	<i>Chigua</i> spp.	
	<i>Encephalartos</i> spp.	
	<i>Microcycas calocoma</i>	
ZINGIBERACEAE		<i>Hedychium</i> <i>philippinense</i>
ZYGOPHYLLACEAE		<i>Guaiacum sanctum</i> 1

1990-54

Endangered Species

*Guaiacum officinale***SCHEDULE 3**

Section 2(1)

Items the importation and exportation of which are restricted.

1. Whale meat and whale offals.
2. Whalebone, if unworked or simply prepared, and hair and waste of whalebone.
3. Whale fat and whale oil (other than sperm oil), whether or not refined or modified.
4. Whalemeat extracts and whalemeat juices.
5. Any bracelet wholly or partly of the hair of any animal of the family Elephantidae.
6. Any tusk of any of the following animals, namely—
 - (a) any animal of the family Elephantidae;
 - (b) any animal of the family Suidae;
 - (c) any animal of the species *Monodon monoceros*;
 - (d) any animal of the species *Odobenus rosmarus*;

and any part of any such tusk and powder and waste of any tusk of any of the animals referred to in sub-paragraphs (a) to (d) of this paragraph.

7. The horn of any animal of the family Rhinocerotidae, if unworked or simply prepared, any part of any such horn and powder and waste of any horn of any such animal.
8. Any tooth of any animal, if unworked or simply prepared, any part of any such tooth and powder and waste of any tooth of any animal.
9. The stuffed head, or the skull together with the skin covering it, of any animal of any of the families Elephantidae and Rhinocerotidae.
10. (1) Any furskin of a defined animal, if raw, tanned or dressed.

(2) Tanned or dressed furskins of a defined animal or defined animals which are assembled in plates, rectangles, crosses, trapeziums or otherwise.

(3) Any piece or cutting (including the head, tail and any paw) of any furskin of a defined animal.

(4) Any rug, coverlet, coat, jacket, cape or stole made wholly or partly of any furskin of a defined animal.

(5) In this paragraph a defined animal means an animal in the First Schedule.

11. Hair, whether or not carded or combed, of any animal of the species *Vicugna vicugna*.

12. Musk derived from any animal of the sub-species *Moschus moschiferus moschiferus*.

13. The raw hide or skin, if fresh, salted, dried, pickled or limed and whether or not split, and the leather of any animal of any of the orders Crocodylia, Lacertilia and Serpentes.

14. The dried body of any animal of any of the families Alligatoridae and Crocodylidae.

15. The shell and scales, if unworked or simply prepared the waste of the shell and scales, and the claws, of any animal of the family Cheloniidae.

16. The preserved body of any animal of the sub-species *Atelopus varius zeteki*.

17. The whole shell of any animal of the species *Papustyla pulcherrima* (otherwise known as *Papuina pulcherrima*).

18. Plumage, that is to say, any feather or feathers, or any skin or any other part with any feather or feathers on it, of any bird or birds, except where the plumage is that only of—

a bird ordinarily used in Gibraltar as part of the human diet.

19. Anything made wholly or partly of plumage (within the meaning of paragraph 18 above and subject to the exception there stated).

20. The stem of any plant of the family Cyatheaceae.

21. Derivates of any of the animals or plants specified in Schedules 1 or 2.

SCHEDULE 4.

Section 5(3)

INTERPRETATION OF SCHEDULES 1 AND 2

1. Species included in Schedules 1 and 2 are referred to:
 - (a) by the name of the species; or
 - (b) as being all of the species included in a higher taxon or designated part thereof
2. The abbreviation “spp.” is used to denote all species of a higher taxon.
3. Other references to a taxon higher than species are for the purposes of information or classification only.
4. The abbreviation “p.e.” is used to denote species that are possibly extinct.
5. The symbol (–) followed by a number placed against the name of a species or higher taxon denotes that designated geographically separate populations, species, groups of species or families of that species or taxon are excluded from the appendix concerned, as follows:–
 - 101 Population of West Greenland
 - 102 Population of Bhutan, India, Nepal and Pakistan
 - 104 Population of China
 - 105 Population of Australia
 - 106 Population of United States of America
 - 107–*Chile*: part of the population of Parinacota Province, Ia. Region of Tarapacá
 - Peru*: populations of Pampa Galeras National Reserve and Nuclear Zone, Pedregal, Osconta and Sawacocha (Province of Lucanas), Sais Picotani (Province of Azangaro), Sais Tupac Amaru (province of Janin), and of Salinas Aguada Blanca National Reserve (Provinces of Arequipa and Cailloma)
 - 108 Population of Afghanistan, Bhutan, Burma, India, Nepal and Pakistan
 - 109 Cathartidae
 - 110 Population of United States of America
 - 111 *Melopsittacus undulatus*, *Nymphicus hollandicus* and *Psittacula krameri*
 - 112 Population of the Congo and subject to an annual export quota of 600 (in 1990, 1991 and 1992)

- 113 Population of Botswana, Malawi, Mozambique, Zambia and Zimbabwe and populations of the following countries subject to the specified annual export quotas:

	1990	1991	1992	
Kenya	5,000	6,000	8,000	(skins and derivatives only)
Madagascar	0	2,000	3,100	(ranching specimens only)
Somalia	500	500	500	
South Africa			1,000	
Sudan	5,040	0	0	
Uganda			2,500	
United Republic of Tanzania	1,100	5,100	6,100	
(ranching specimens: wild-taken specimens hunting trophies:	0	4,000	6,000	
	1,000	1,000	0	
	100	100	100	
Total	5,000	6,000	7,500	
Ranching specimens	2,000	3,000	5,000	
Wild skins with belly width of 10-18"	3,000	3,000	2,500	

- 114 Population of Indonesia subject to the following quotas:
(1992: 9,700; 1993: 8,500; 1994: 8,500)
- 116 Population of Indonesia subject to specified annual export quotas
(1990: 1,250; 1991: 1,500; 1992: 2,500 including 50% ranching specimens)
- 117 Population of Chile
- 118 All species that are not succulent

6. The symbol (+) followed by a number placed against the name of a species or higher taxon denotes that only designated geographically separate populations, subspecies or species of that species or taxon are included in the appendix concerned as follows:

- +201 Population of South America (populations outside South America are not included in the appendices)
- +202 Populations of Bhutan, India, Nepal and Pakistan
- +203 Population of Mexico
- +204 Populations of Cameroon and Nigeria
- +205 Population of Asia
- +206 Population of India
- +207 Populations of Central and North America
- +208 Population of Australia

1990-54

Endangered Species

- +209 –*Chile*: part of the population of Parinacota Province, Ia. Region of Tarapacá
 –*Peru*: populations of Pampa Galeras National Reserve and Nuclear Zone, Pedregal, Osconta and Sawacocha (Province of Lucanas), Sais Picotani (Province of Azangaro), Sais Tupac Amaru (Province of Janin), and of Salinas Aguada Blanca National Reserve (Provinces of Arequipa and Cailloma)
- +210 Populations of Afghanistan, Bhutan, Burma, India, Nepal and Pakistan
- +211 Population of Mexico
- +212 Populations of Algeria, Burkina Faso, Cameroon, the Central African Republic, Chad, Mali, Mauritania, Morocco, the Niger, Nigeria, Senegal and the Sudan
- +213 Population of Europe, except the Union of Soviet Socialist Republics
- +214 Population of Indonesia subject to specified annual export quotas (1992: 2,500; 1993: 3,000; 1994: 4,000 all bred in captivity)
- +215 All species of New Zealand
- +216 Population of Chile

7. The symbol (=) followed by a number placed against the name of a species or higher taxon denotes that the name of that species or taxon shall be interpreted as follows:

- = 301 Includes family Tupaiidae
- = 302 Includes generic synonym *Leontideus*
- = 303 Includes synonym *Saguinus geoffroyi*
- = 304 Includes synonym *Cercopithecus roloway*
- = 305 Includes synonym *Colobus badius kirki*
- = 306 Includes synonym *Colobus badius rufomitratu*
- = 307 Includes generic synonym *Simias*
- = 308 Includes generic synonym *Mandrillus*
- = 309 Includes generic synonym *Rhinopithecus*
- = 310 Includes synonyms *Bradypus boliviensis* and *Bradypus griseus*
- = 311 Includes synonym *Priodontes giganteus*
- = 312 Includes synonym *Physeter catodon*
- = 313 Includes synonym *Eschrichtus glaucus*
- = 314 Includes generic synonym *Eubalaena*
- = 315 Includes synonym *Dusicyon fulvipes*
- = 316 Includes generic synonym *Fennecus*
- = 317 Also referenced as *Ursus thibetanus*
- = 318 Includes generic synonym *Thalarctos*
- = 319 Also referenced as *Aonyx microdon* or as *Paraonyx microdon*
- = 320 Includes synonyms *Lutra annectens*, *Lutra enudris*, *Lutra incarum* and *Lutra platensis*
- = 321 Includes synonym *Eupleres major*
- = 322 Also referenced as *Lynx caracal* includes generic synonym *Caracal*
- = 323 Also referenced as *Lynx pardinus* or *Felis lynx pardina*

- = 324 Also referenced as *Lynx rufus escuinapae*
- = 325 Includes synonyms *Equus kiang* and *Equus onager*
- = 326 Includes generic synonym *Dama*
- = 327 Includes generic synonyms *Axis* and *Hyelaphus*
- = 328 Includes synonym *Bos frontalis*
- = 329 Includes synonym *Bos grunniens*
- = 330 Includes generic synonym *Novibos*
- = 331 Includes generic synonym *Anoa*
- = 332 Includes synonym *Oryx tao*
- = 333 Includes synonym *Ovis aries ophion*
- = 334 Also referenced as *Anas platyrhynchos laysanensis*
- = 336 Includes synonym *Falco pelegrinoides* and *Falco babylonicus*
- = 337 Includes generic synonym *Pipile*
- = 338 Includes generic synonym *Mitu*
- = 339 Includes synonym *Rheinartia nigerscens*
- = 340 Also referenced as *Eupodotis bengalensis*
- = 341 Often traded under the incorrect designation *Ara caninde*
- = 342 Includes generic synonym *Cyclopsitta*
- = 343 Formerly included in genus *Gallirex*
- = 344 Also referenced as *Mimizuku gurneyi*
- = 345 Formerly included in genus *Ramphodon*
- = 346 Also referenced as *Muscicapa ruecki*
- = 346a Also referenced as *Xauthospar flavus*
- = 346b Also referenced as *Serinus gularis* (in part)
- = 347 Formerly included in genus *Spinus*
- = 348 Includes generic synonyms *Nicoria* and *Geoemyda* (part)
- = 349 Also referenced in genus *Testudo*
- = 350 Formerly included in *Podocnemis* spp.
- = 351 Includes Alligatoridae, Crocodylidae and Gavialidae
- = 352 Formerly included in *Chamaeleo* spp.
- = 353 Also referenced as *Constrictor constrictor occidentalis*
- = 354 Includes synonym *Pseudoboa cloelia*
- = 355 Also referenced as *Hydrodynastes gigas*
- = 356 Includes generic synonym *Megalobatrachus*
- = 357 *Sensu* D'Abbrera
- = 358 Also referenced in genus *Dysnomia*
- = 359 Includes generic synonym *Proptera*
- = 360 Also referenced in genus *Carunculina*
- = 361 Includes generic synonym *Micromya*
- = 362 Includes generic synonym *Papuina*
- = 363 Also referenced as *Podophyllum emodi*
- = 364 Also referenced in genus *Sclerocactus*
- = 365 Also referenced in genus *Echinocactus*
- = 366 Also referenced in genus *Pachycereus*
- = 367 Also referenced in genus *Escobaria*
- = 368 Also referenced as *Echinocereus lindsayi*
- = 369 Also referenced as *Wilcoxia schmollii*
- = 370 Also referenced in genus *Neolloydia* or in genus *Sclerocactus*

1990-54

Endangered Species

- = 371 Also referenced as *Solisia pectinata*
- = 372 Also referenced as *Lobeira macdougallii*
- = 373 Also referenced as genus *Neolloydia*
- = 374 Also referenced as *Saussurea lappa*
- = 375 Also referenced as *Engelhardia ptercarpa*
- = 376 includes families Apostasiaceae and Cyripediaceae as subfamilies Apostasioideae and Cyripedioideae
- = 377 Also referenced as *Lycaste virginalis* var. *alba*
- = 378 Also referenced as *Sarracenia rubra alabamensis*
- = 379 Also referenced as *Sarracenia rubra jonesii*
- = 380 Includes synonym *Stangeria paradoxa*
- = 381 Includes synonym *Welwitschia bainesii*
- = 382 Includes synonym *Tamandua mexicana*
- = 383 Includes synonym *Cabassous gymnurus*
- = 384 Includes synonym *Manis longicaudata*
- = 385 Includes generic synonym *Coendou*
- = 386 Includes generic synonym *Cuniculus*
- = 387 Includes synonym *Vulpes vulpes leucopus*
- = 388 Includes synonym *Nasua narica*
- = 389 Includes synonym *Galictis allamandi*
- = 390 Includes synonym *Martes gwatkinsi*
- = 391 Includes generic synonym *Viverra*
- = 392 Also referenced as *Tragelaphus eurycerus*; includes generic synonym *Taurotragus*
- = 393 Formerly included as *Bubalus bubalis* (domesticated form)
- = 394 Also referenced as *Ardeola ibis*
- = 395 Also referenced as *Egretta alba*
- = 396 Also referenced as *Spatula clypeata*
- = 397 Also referenced as *Nyroca nyroca*
- = 398 Includes synonym *Dendrocygna fulva*
- = 399 Also referenced as *Cairina hartlaubii*
- = 400 Also referenced as *Crax pauxi*
- = 401 Includes synonym *Arborophila orientalis*
- = 402 Also referenced as *Turturoena iriditorques* or *Columba malherbii* (in part)
- = 403 Also referenced as *Columba mayeri*
- = 404 Also referenced as *Treron australis* (in part)
- = 405 Also referenced as *Calopelia brehmeri*; includes synonym *Calopelia puella*
- = 406 Also referenced as *Tympanistria tympanistria*
- = 407 Also referenced as *Terpsiphone bourbonnensis*
- = 408 Also referenced as *Estrilda subflava* or *Sporaeginthus subflavus*
- = 409 Also referenced as *Lagono-Sticta Binacea*
- = 410 Includes generic synonym *Spermestes*
- = 411 Also referenced as *Euodice cantans* includes synonym *lonchura malabarica*
- = 412 Also referenced as *Hypargos nitidulus*

- = 413 Includes synonym *Parmoptila rubrifrons*
- = 414 Includes synonyms *Pyrenestes frommi* and *Pyrenestes rothschildi*
- = 415 Also referenced as *Estrilda bengala*
- = 416 Includes synonym *Bubalornis niger*
- = 417 Also referenced as *Euplectes afra*
- = 418 Also referenced as *Coliuspasser ardens*
- = 419 Also referenced as *Coliuspasser macrourus*
- = 420 Includes synonym *Euplectes orix*
- = 421 Also referenced as *Malimbus rubricops* or *Anaplectes melanotis*
- = 422 Includes synonyms *Passer diffusus*, *Passer gongonensis*, *Passer suahelicus* and *Passer swainsonii*
- = 423 Includes synonym *Ploceus nigriceps*
- = 424 Includes synonym *Ploceus atrogularis*
- = 425 Also referenced as *Sitagra luteola*
- = 426 Also referenced as *Sitagra melanocephala*
- = 427 Includes synonyms *Ploceus katangue*, *Ploceus reichardi*, *Ploceus ruweti* and *Ploceus vitellinus*
- = 428 Also referenced as *Hypochera chalybeata*; includes synonyms *Vidua amauropteryx*, *Vidua centralis*, *Vidua neumanni*, *Vidua okavangoensis* and *Vidua ultramarina*
- = 429 Includes synonym *Vidua orientalis*
- = 430 Also referenced as *Pelusios subniger*
- = 431 Formerly included in genus *Natrix*

8. The symbol (°) followed by a number placed against the name of a species or higher taxon shall be interpreted as follows—

°501 For the exclusive purpose of allowing international trade in cloth made from wool sheared from live vicunas of the populations referred to in +209. and of items made thereof. The reverse side of the cloth must bear the logotype adopted by the range states of the species, which are signatories to the Convenio para la Conservacion y Manejo de la Vicuna, and the selvages either the words VICU ANDES-CHILE or the words VICU ANDES-PERU. depending on the country of origin.

°502 Fossils are not subject to CITES provisions.

9. The symbol (≠) followed by a number placed against the name of a species or higher taxon included in the Schedules designates parts or derivates which are specified in relation thereto for the purposes of the Act as follows:—

≠ 1 Designates all parts and derivates, except:—

- (a) seeds, spores and pollen (including pollinia): and
- (b) tissue cultures and flaked seedlings cultures.

1990-54

Endangered Species

≠ 2 Designates all parts and derivatives, except:

- (a) seeds and pollen;
- (b) tissue cultures and flasks seedling cultures; and
- (c) chemical derivatives.

≠ 3 Designates roots and readily recognizable parts thereof.

≠ 4 Designates all parts and derivatives, except:

- (a) seeds and pollen;
- (b) tissue cultures and flasks seedling cultures;
- (c) fruits and parts and derivatives thereof of naturalized or artificially propagated plants; and
- (d) separate stem joints (pads) and parts and derivatives thereof of naturalized or artificially propagated *Opuntia* subgenus *Opuntia* spp.

≠ 5 Designates all parts and derivatives, except:

- (a) seeds and pollen;
- (b) tissue cultures and flasks seedling cultures; and
- (c) separate leaves and parts and derivatives thereof of naturalized or artificially propagated *Aloe vera*.

≠ 6 Designates all parts and derivatives, except:

- (a) seeds and pollen (including pollinia);
- (b) tissue cultures and flasks seedling cultures;
- (c) cut flowers of artificially propagated plants; and
- (d) fruits and parts and derivatives thereof of artificially propagated *Vanilla* spp.

10. As one of the species or higher taxa of FLORA included in the Second Schedule are annotated, this means that artificially propagated hybrids produced from one or more of these species or taxa may be traded with a certificate of artificial propagation.

11. Where the name of a country is given in brackets the restriction applies only to the taxon originating in that county.

Nature Protection Act 1991

NATURE PROTECTION ACT, 1991

Principal Act

Act. No. 1991-11	<i>Commencement</i>	9.5.1991
	<i>Assent</i>	9.5.1991
Amending enactments	Relevant current provisions	Commencement date
Act. 1992-08	ss. 5(1)(d)(e)(f), (4), 10(1) (d)(e)(f),(2),3(a) and (6)	9.7.1992
LN. 1995/118	ss. 2(1)(3A), 2A, 3(1)(d)(c), 5(1)(e)(ee), 17A to Z, 17AA, 17BB, 17CC, 17DD, 18(1) and Schs 4 to 7	1.9.1995
Act. 1997-15	Sch 5	10.4.1997
2001-23	s. 24A	12.7.2001
2005-41	ss. 2, 5(1)(e) and (ee), 17S, 17W, 17XA, 17Y, 23, Sch. 5, Sch. 7 and Sch. 8	14.7.2005
2007-12	ss. 2, 2A, 3(1)(bb), 17M, 17PA, 17RA, 17RB, 17T, 17U, 17V, 17VA, 17VB, 17VC, 17X, 17Y, 17Z, 17AB, 17EE, 17FF, 17GG, 17HH, 18(1)-(10), 20, 24, 24A, Schs. 4, 5, 7 & 9	30.4.2007*
2007-17	ss. 5(2), 10(4), 13(1), (2), (3) & (7), 17CC(3) & (4), 18(1), (2), (3), (4) & (6), 21(1) & (2), 24	14.6.2007
LN. 2008/026	Sch. 5	10.4.2008
Act. 2009-07	ss. 17PA(1), (1A) & (2), 17RA(1), (2) & (3), 17RB(1) & (2), 17T(1)(b)(i), 17U(5), 17VA(1), (2), (3) & (4), 17VB(1)	15.1.2009
LN. 2010/145	ss. 2(1), (3A), 3(1), 5(1) & (2), 6, 7A, 10, 12, 12A, 13(1)(g) & (h), (5) & (6A), 13A, 17DA, 17DB, 17E, 17G, 17H, 17P, 17PA, 17RA(1), 17XA(2)(a) & Sch. 8	9.9.2010
2011/012	ss. 2(1) & (4), 17A(1) & (2), 17DA(2)(b), 17G(1), 17GA, 17GB, 17PA(1), (2) & (4), 18ZA & 18(2)	10.2.2011
Act. 2011-19 ¹	ss. 24A, 24B, 24C, 24D, 24E, 24F &	

* Commencement notice LN. 2007/062

1991-11

Nature Protection

	Sch. 10	18.8.2011
2012/033	ss. 2B, 2C, 7A(2)(a)-(e), 13(6A), 17DA(1)(b), 17E, 18(1)(b) & (c) & 21A	19.3.2012
2013/137	Sch. 5 & 8	10.10.2013
Act. 2013-24	s. 10(1)(b) & (ba)	31.10.2013
LN. 2013/173	ss. 7A(4) & 18ZA	5.12.2013
Act. 2013-16	ss. 13(1)(i), (2)(f), 18(5), (5)(a)(ia), (5)(b) & 24(e)	12.12.2013 ²

EU Legislation/International Agreements involved:

Directive 79/409/EEC

Directive 92/43/EEC

Directive 2006/105/EC

Directive 2009/147/EC

Directive 2013/17/EU

English sources:

None cited

¹ *The provisions of Schedule 10 of the Nature Protection Act inserted by this amendment supersede all other arrangements relating to admission fees to the Upper Rock Nature Reserve and fees collected under such other arrangements shall be deemed to have been duly collected under this Act.*

² LN. 2013/179

ARRANGEMENT OF SECTIONS.**PART I.
PRELIMINARY.**

Section

1. Short Title.
2. Interpretation and application.

**PART II.
PROTECTION OF WILD BIRDS, WILD ANIMALS AND WILD
PLANTS.**

- 2A. Disapplication.
- 2B. Assessment and protection of wild bird species.
- 2C. Directions.
3. Protection of wild birds, their nests and eggs.
4. Exceptions to section 3.
5. Prohibition of certain methods of hunting, killing, injuring or taking wild birds.
6. Sale etc of wild or dead wild birds, eggs etc.
7. Protection of captive birds.
- 7A. Special conservation measures.
8. Protection of certain wild animals.
9. Exceptions to section 8.
10. Prohibition on certain methods of killing or taking wild animals.
11. Protection of wild plants.
12. Introduction of new species of animals or plants.
- 12A. Introduction of new species of birds.
13. Power to grant licences.
- 13A. Implementation reports.
14. False statements
15. Attempts to commit offences.
16. Enforcement.
17. Penalties, forfeitures etc.

**PART IIA
DESIGNATION OF SITES, ETC.**

- 17A. Application etc..

Designation of sites under the Habitats Directive

- 17B. Selection of sites eligible for identification as of Community importance.
- 17C. Adoption of list of sites: designation of special areas of conservation.

Nature Protection

17D. Consultation as to inclusion of site omitted from the list.

Designation of sites under the Wild Birds Directive

17DA. Designation of special protected areas.

17DB. Information to be sent to the European Commission.

European Sites

17E. Meaning of “European site” and “European Marine site”.

17F. Notice to landowners, relevant persons, etc..

17G. Management agreements.

17GA. Management Agreements: determination by Minister.

17GB. Appeal to the Magistrates’ Court.

17H. Notification of potentially damaging operations.

17J. Restriction on carrying out operations specified in notification.

17K. Supplementary provisions as to consents.

17L. Provisions as to existing notices and consents.

17M. Power to make special nature conservation order.

17N. Restriction on carrying out operations specified in a special nature conservation order.

17P. Supplementary provisions as to consents.

17PA. Prevention of deterioration.

17Q. European Marine Site.

17R. Management scheme for European Marine Site.

Surveillance

17RA. Surveillance of conservation status of habitats and species.

Protection of animals

17RB. Protection of certain animals from exploitation.

17S. *Repealed.*

17T. Protection of certain wild animals.

17U. Exemptions from section 17T.

17V. Prohibition of certain methods of taking or killing wild animals.

17VA. Monitoring incidental capturing and killing.

17VB. Protection from incidental capture and killing.

17VC. Minister may make Regulations.

17W. *Repealed.*

Protection of plants

17X. Protection of certain wild plants.

Trade in wild birds of European Origin

17XA. Protection of wild birds of European origin.

Licences

- 17Y. Grant of licences for certain purposes.
- 17Z. Licences: supplementary provisions.
- 17AA. False statements made for obtaining licence.
- 17AB. Offence of breaching a licence condition.

Miscellaneous

- 17BB. General provisions for protection of European sites.
- 17CC. Considerations of overriding public interest.
- 17DD. Information for Commission.

PART IIB

APPROPRIATE ASSESSMENTS FOR LAND USE PLANS

- 17EE. Interpretation for Part IIB.
- 17FF. Assessment of implications for European site or European marine site.
- 17GG. Considerations of overriding public interest.
- 17HH. Compensatory measures.

PART III.

NATURE CONSERVATION.

- 18ZA. Protection of habitats from pollution or deterioration.
- 18. Areas of special interest.
- 19. Penalties in relation to nature conservation areas and marine nature areas.
- 20. Scientific Authorities.
- 21. Wildlife Warden.
- 21A. Promotion of research etc.
- 22. Offences by bodies corporate etc.
- 23. Amendment to Schedules.
- 24. Regulations.
- 24A. Fees for entry into a nature conservation area.
- 24B. Fees for entry into tourist sites within a nature conservation area.
- 24C. Fees (Miscellaneous).
- 24D. Terms and conditions of entry.
- 24E. Offences.
- 24F. Exclusion Orders.
- 25. Amendment to Animals and Birds Act.

SCHEDULE 1 – SPECIFIED WILD ANIMALS.

SCHEDULE 2 – EXCLUDED PLANTS.

1991-11

Nature Protection

- SCHEDULE 3 – ENDANGERED WILD BIRDS, WILD ANIMALS AND WILD PLANTS.
- SCHEDULE 4 – PROCEDURE IN CONNECTION WITH ORDERS UNDER SECTION 17M.
- SCHEDULE 5 – EUROPEAN PROTECTED SPECIES OF ANIMALS.
- SCHEDULE 6 – ANIMALS WHICH MAY NOT BE TAKEN OR KILLED IN CERTAIN WAYS.
- SCHEDULE 7 – *Repealed*
- SCHEDULE 8 – THIS SCHEDULE REPRODUCES THE TEXT OF DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 30 NOVEMBER 2009 ON THE CONSERVATION OF WILD BIRDS
- SCHEDULE 9 – WILD BIRDS WHICH RE-USE THEIR NESTS
- SCHEDULE 10 – ADMISSION FEES

AN ACT TO PROVIDE FOR THE PROTECTION OF WILD BIRDS, ANIMALS AND PLANTS AND FOR THE DESIGNATION AND PRESERVATION OF PROTECTED AREAS FOR THE PURPOSE OF NATURE CONSERVATION AND MATTERS INCIDENTAL THERETO.

PART I.
PRELIMINARY.

Title and commencement.

1. This Act may be cited as the Nature Protection Act 1991 and shall come into effect on a date to be appointed by the Governor by notice in the Gazette and different days may be so appointed for different purposes.

Interpretation and application.

2.(1) In this Act, unless the context otherwise requires—

“advertisement” includes a catalogue, circular or pricelist;

“animal of a European protected species” means an animal listed in Annex IV(a) to the Habitats Directive;

“aviculture” means the breeding and rearing of birds in captivity;

“biotope” has the same meaning given to it in the Wild Birds Directive;

“BGTW” means British Gibraltar Territorial Waters which is the area of sea, the sea bed and subsoil within the seaward limits of the territorial sea adjacent to Gibraltar under British sovereignty and which, in accordance with the United Nations Convention on the Law of the Sea 1982, currently extends to three nautical miles and to the median line in the Bay of Gibraltar;

“destroy”, in relation to an egg, includes doing anything to the egg which is calculated to prevent it from hatching, and “destruction” shall be construed accordingly;

“European site” and “European marine site” have the meanings given them in section 17E;

“firearm” has the meaning given to it in section 2 of the Firearms Act;

Nature Protection

- “habitat” means an area used in relation to wild birds and animals for feeding, breeding and nesting and in relation to wild plants the area in which normal growth occurs;
- “Habitats Directive” means Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora as the same may from time to time be amended (which is reproduced in Schedule 5 for information purposes);
- “marine nature area” means an area designated under section 18(2);
- “Minister” means the Minister with responsibility for the Environment;
- “Nature Conservancy Council” means such Nature Conservancy Council as may be established under section 20, as a scientific authority and as the Minister may specify as the Nature Conservancy Council for the purposes of this Act;
- “nature conservation area” means an area designated under section 18(1);
- “pick”, in relation to a plant, means gather, cut or pluck any part of the plant without uprooting it;
- “plant of a European protected species” means a plant listed in either Annex II(b) or Annex IV(b) to the Habitats Directive;
- “poultry” means domestic fowls, geese, ducks, guinea fowls, pigeons, quails and turkeys;
- “sale” includes hire, barter and exchange and cognate expressions shall be construed accordingly;
- “special area of conservation” or “SAC” means a site designated under section 17C;
- “special protection area” or “SPA” means a site designated under section 17DA;
- “uproot”, in relation to a plant, means dig up or otherwise remove the plant from the land or other medium on which it is growing;
- “vehicle” includes aircraft, hydrofoil, hovercraft and boat;
- “wild animal” means any animal (other than a bird) of a kind which is or (before it was killed or taken) was resident in or a visitor to Gibraltar in a wild state;

“wild bird” means any bird, other than poultry, of a kind which is ordinarily resident in or is a visitor to Gibraltar in a wild state and species of naturally occurring birds in the wild state which are native to any Member State;

“Wild Birds Directive” means Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, as the same may from time to time be amended (and which is reproduced in Schedule 8 for information purposes);

“wild bird of European origin” means any wild bird of a species which is ordinarily resident in or a visitor to the European territory of another member State;

“wild plant” means any plant which is or (before it was picked, uprooted or destroyed) was growing wild and is of a kind which grows in Gibraltar in a wild state.

(2) A bird shall not be treated as bred in captivity for the purpose of this Act unless its parents were lawfully in captivity when the egg was laid.

(3) Any reference in this Act to an animal or bird or any species includes, unless the context otherwise requires, a reference to an egg, larva, pupa, or other immature stage of an animal or bird of that species.

(3A) Unless the context otherwise requires expressions used in Part IIA and in the Habitats Directive have the same meaning as in that Directive.

(3B) Unless the context otherwise requires expressions used in this Act and in the Wild Birds Directive have the same meaning in this Act as they have in that Directive.

(4) This Act applies to—

(a) BGTW; and

(b) any area of sea, the sea bed and subsoil within the limits of the exclusive economic zone adjacent to Gibraltar, when and if that zone is established.

PART II

PROTECTION OF WILD BIRDS, WILD ANIMALS AND WILD PLANTS.

Disapplication.

Nature Protection

2A. Unless otherwise stated, this Part shall not apply in respect of an animal of a European protected species or to a plant of a European protected species.

Assessment and protection of wild bird species.

2B.(1) The Minister, through appropriate means, must establish the conservation status of all wild bird species which are either resident in or visitors to Gibraltar, BGTW or to both, and shall conduct such periodic reviews as may be required to maintain such information relevant and up to date.

(2) Based on the information obtained under subsection (1) the Minister must take such measures as are required to maintain or adapt the population of such wild bird species at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements.

(3) In the light of the duties under subsection (2) the Minister must by order take such measures as are required to preserve, maintain or re-establish a sufficient diversity and area of habitats for all the wild bird species to which this section applies.

(4) For the purposes of subsection (3) the preservation, maintenance and re-establishment of biotopes and habitats shall include primarily the following measures—

- (a) creation of protected areas;
- (b) upkeep and management in accordance with the ecological needs of habitats—
 - (i) inside; and
 - (ii) outside,the protected zones;
- (c) re-establishment of destroyed biotopes;
- (d) creation of biotopes.

(5) Where the Minister makes an Order under this section in respect of an area of land or sea, the Minister may declare that area shall be treated for the purposes of this Act as a European Site or European Marine Site.

Directions.

2C.(1) In furtherance of any matter provided for under section 2B, the Minister may issue a Direction in writing specifying the action to be taken by the person named therein and within the time stated.

(2) A person who without reasonable excuse fails to comply with such a direction shall be guilty of an offence and shall be liable on summary conviction to a fine up to level 3 on the standard scale.

Protection of wild birds, their nests and eggs.

3.(1) Subject to the provisions of this Part, if any person intentionally—

- (a) hunts, kills, injures or takes any wild bird;
- (b) takes, damages or destroys the nest of any wild bird by any method while that bird's nest is in use or being built;
- (bb) takes, damages or destroys the nest of any wild bird included in Schedule 9;
- (c) takes or destroys an egg of any wild bird; or
- (d) disturbs any wild birds,

he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person has in his possession or control—

- (a) any live or dead wild bird or any part of, or anything derived from, such a bird; or
- (b) any egg of a wild bird or any part of such an egg,

he shall be guilty of an offence.

(3) A person shall not be guilty of an offence under subsection (2) if he shows that—

- (a) the bird or egg had not been killed or taken, or had been killed or taken otherwise than in contravention of the provisions of this Part; or
- (b) the bird or egg or other thing in his possession or control had been sold (whether to him or any other person) otherwise than in contravention of those provisions.

(4) Subject to the provisions of the Part, if any person intentionally—

1991-11

Nature Protection

- (a) disturbs any wild bird while it is building a nest or is in, on or near a nest containing eggs or young; or
- (b) disturbs dependent young of such a bird,

he shall be guilty of an offence.

(5) In this section “ wild bird” does not include any bird which is shown–

- (a) to have been bred in captivity; or
- (b) to have been imported into Gibraltar in accordance with the requirements of any other relevant Act.

Exceptions to section 3.

4.(1) Notwithstanding anything in the provisions of section 3, a person shall not be guilty of an offence by reason of–

- (a) the taking of any wild bird, if he shows that the bird had been disabled otherwise than by his unlawful act and was taken solely for the purpose of passing that bird within a period of 12 hours to a person licensed under section 13(1) to tend it and release it when no longer disabled;
- (b) the killing of any wild bird, if he shows that the bird had been so seriously disabled otherwise than by his unlawful act that there was no reasonable chance of its recovering; or
- (c) any act made unlawful by those provisions, if he shows that the act was the incidental result of a lawful operation and could not reasonably have been avoided.

(2) Notwithstanding anything in the provisions of section 3, a person licensed under section 13 shall not be guilty of an offence by reason of–

- (a) the killing or taking of a wild bird or the injuring of such bird in the course of an attempt to kill it;
- (b) the taking, damaging or destruction of the nest of a wild bird;
- (c) the taking or destruction of any egg of a wild bird; or
- (d) the disturbance of a wild bird or dependent young of such a bird,

where that act was carried out in accordance with and for the purposes of the licence.

Prohibition of certain methods of hunting, killing, injuring or taking wild birds.

5.(1) Without prejudice to section 3(1), if a person, with a view to hunting, killing, injuring or taking a wild bird—

- (a) sets in position any of the following articles, being an article which is of such a nature and is so placed as to be calculated to cause bodily injury to any wild bird coming into contact therewith, that is to say, any spring, traps, gin, snare, hook and line, any electrical device for killing, stunning or frightening or any poisonous, poisoned or stupefying substance;
- (b) uses any such article as is specified in paragraph (a), whether or not of such a nature and so placed as specified in paragraph (a), or any net, baited board, bird-lime or substance of a like nature to bird-lime;
- (c) uses—
 - (i) any bow or crossbow, sling or catapult;
 - (ii) any explosive;
 - (iii) any automatic or semi-automatic weapon;
 - (iv) any shotgun;
 - (v) any device for illuminating a target or any sighting device for night shooting;
 - (vi) any form of artificial lighting or any mirror or other dazzling device;
 - (vii) any gas or smoke not falling within paragraphs (a) or (b);
 - (viii) any chemical wetting agent; or
 - (ix) any live animal or bird;
- (d) uses as a decoy, any sound recording or any live bird or other animal whatever which is tethered, or which is secured by means of braces or other similar appliances, or which is blind, maimed or injured;

1991-11

Nature Protection

- (e) uses any mechanically propelled vehicle in immediate pursuit of a wild bird; or
- (f) knowingly causes or permits to be done an act which is mentioned in the foregoing provisions of this subsection,

he shall be guilty of an offence.

(2) *Repealed.*

(3) In any proceedings under subsection (1)(a), it shall be a defence for a person charged thereunder to show that the article was set in position for the purpose of killing or taking, in accordance with a licence granted under section 13, any wild animals which could be lawfully killed or taken by those means and that he took all reasonable precautions to prevent injury thereby to wild birds.

(4) In any proceedings under sub-section (1)(f) relating to an act which is mentioned in sub-section (1)(a), it shall be a defence for a person charged thereunder to show that the article was set in position for the purpose of killing or taking, in accordance with a licence granted under section 13, any wild animals which could be lawfully killed or taken by those means and that he took or caused to be taken all reasonable precautions to prevent injury thereby to wild birds.

Sale etc. of wild or dead wild birds, egg etc.

6.(1) Subject to the provisions of this Part, if any person—

- (a) sells, offers or exposes for sale, or has in his possession or transports the purpose of sale, any live wild bird or any readily recognisable parts or derivatives thereof, an egg of a wild bird or any part of such an egg; or
- (b) publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things,

he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person shows or causes or permits to be shown for the purposes of any competition or in any premises in which a competition is being held—

- (a) any live wild bird; or
- (b) any live bird one of whose parents was such a wild bird,

he shall be guilty of an offence.

(3) In this section “wild bird” does not include any bird which is shown—

- (a) to have been bred in captivity; or
- (b) to have been imported into Gibraltar in accordance with the requirements of any other Act.

Protection of captive birds.

7.(1) If any person keeps or confines any bird whatever in any cage or other receptacle which is not sufficient in height, length or breadth to permit the bird to stretch its wings freely, he shall be guilty of an offence.

(2) Subsection (1) does not apply to poultry, or to the keeping or confining of any bird—

- (a) while that bird is in the course of conveyance, by whatever means;
- (b) while that bird is being shown for the purpose of any public exhibition or competition, if the time during which the bird is kept or confined for those purposes, does not in the aggregate exceed 72 hours; or
- (c) while that bird is undergoing examination or treatment by a veterinary surgeon or veterinary practitioner.

(3) Every person who—

- (a) promotes, arranges, conducts, assists in, receives money for, or takes part in, any event whatever at or in the course of which captive birds are liberated by hand or by any other means whatever for the purpose of being shot immediately after their liberation; or
- (b) being the owner or occupier of any land, permits that land to be used for the purposes of such an event,

shall be guilty of an offence.

Special conservation measures.

7A.(1) Where a species of wild bird is included in Annex I of the Wild Birds Directive, the Minister shall, by Order, adopt special conservation

Nature Protection

measures concerning their habitats in order to ensure the survival and reproduction of such species in their area of distribution.

(2) When adopting measures pursuant to subsection (1), the Minister shall take account of—

- (a) species in danger of extinction;
- (b) species vulnerable to specific changes in their habitat;
- (c) species considered rare because of small populations or restricted local distribution;
- (d) other species requiring particular attention for reasons of the specific nature of their habitat; and
- (e) trends and variations in population levels as a background for evaluations.

(3) When adopting measures pursuant to subsection (1), the Minister shall classify, in particular, the most suitable territories in number and size as special protection areas for the conservation of the species in the geographical sea and land area where this Act applies.

(4) This section shall apply to regularly occurring migratory species not listed in Annex I, bearing in mind their need for protection on land and within BGTW, as regards their breeding, moulting and wintering areas and staging posts along their migration routes.

Protection of certain wild animals.

8.(1) Subject to the provisions of this Part, if any person intentionally kills, injures or takes any wild animal of a kind specified in Schedule 1, he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person has in his possession or control any live or dead wild animal of a kind specified in Schedule 1, or any part of, or anything derived from, such an animal, he shall be guilty of an offence.

(3) A person shall not be guilty of an offence under subsection (2) if he shows that—

- (a) the animal had not been killed or taken, or had been killed or taken otherwise than in contravention of the provisions of this Part; or

(b) the animal or other thing in his possession or control had been sold (whether to him or any other person) otherwise than in contravention of those provisions.

(4) Subject to the provisions of this Part, if any person intentionally–

(a) damages or destroys, or obstructs access to, any structure or place which any wild animal of a kind specified in Schedule 1 uses for shelter or protection; or

(b) disturbs any such animal while it is occupying the structure or place which it uses for that purposes,

he shall be guilty of an offence.

(5) Subject to the provisions of this Part, if any person–

(a) sells, offers or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild animal (other than such an animal shown to have been imported into Gibraltar in accordance with the provision of any other relevant law) of a kind specified in Schedule 1, or any part of, or anything derived from, such an animal; or

(b) publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things,

he shall be guilty of an offence.

(6) In any proceedings for an offence under subsections (1), (2) or (5)(a), the animal in question shall be presumed to have been a wild animal unless the contrary is shown.

Exceptions to section 8.

9.(1) Nothing in subsection (4) of section 8 shall make unlawful anything done within a dwelling house.

(2) Notwithstanding anything in section 8, a person shall not be guilty of an offence by reason of–

(a) the taking of any such animal if he shows that the animal had been disabled otherwise than by his unlawful act and was taken solely for the purpose of tending it and releasing it when no longer disabled;

1991-11

Nature Protection

- (b) the killing of any such animal if he shows that the animal had been so seriously disabled otherwise than by his unlawful act that there was no reasonable chance of it recovering; or
- (c) any act made unlawful by that section if he shows that the act was the incidental result of a lawful operation and could not reasonably have been avoided.

(3) Notwithstanding anything in section 8, a person licensed under section 13(2) shall not be guilty of an offence by reason of the killing or injuring of a wild animal of a kind specified in Schedule 1, if he shows that his actions are in accordance with the terms of that licence.

Prohibition of certain methods of killing or taking wild animals.

10.(1) Subject to the provisions of this Part, if any person—

- (a) sets in position any self-locking snare which is of such a nature and so placed as to be calculated to cause bodily injury to any wild animal coming into contact therewith;
- (b) uses for the purpose of killing or taking any wild animal any self-locking snare, whether or not of such a nature or so placed as aforesaid, any bow or crossbow, any sling or catapult, any explosive, any electrical device for killing or stunning, any automatic or semi-automatic weapon, any shotgun, any device for illuminating a target or sighting device for night shooting, any drift net, any gill net other than a trammel net, any pot, any form of artificial light or any mirror or other dazzling device or any gas or smoke;
- (ba) uses for the purpose of killing or taking any wild animal, any seine or trammel net or device for raking of sea-bed;
- (c) uses as a decoy, for the purpose of killing or taking any wild animal, any live animal or bird whatever or any sound recording;
- (d) uses any mechanical propelled vehicle in immediate pursuit for the purpose of driving, killing or taking any wild animal;
- (e) uses any live bird, mammal for the purpose of killing or taking any wild animal; or
- (f) knowingly causes or permits to be done an act which is mentioned in the foregoing provisions of this subsection,

he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person sets in position or knowingly causes or permits to be set in position any of the following articles, being an article which is of such a nature and so placed as to be calculated to cause bodily injury to any wild animal of a kind specified in Schedule 1 which comes into contact therewith, that is to say, any trap or snare or any poisonous, poisoned or stupefying substance, he shall be guilty of an offence.

(3) subject to the provisions of this Part, if any person—

- (a) sets in position or knowingly causes or permits to be set in position any snare which is of such a nature and so placed as to be calculated to cause bodily injury to any wild animal coming into contact therewith; and
- (b) while the snare remains in position fails, without reasonable excuse, to inspect it, or cause it to be inspected, at least once every day,

he shall be guilty of an offence.

(4) The Government may by order, either generally or in relation to any kind of wild animal specified in that order, amend sub-section (2) by adding any method of killing or taking wild animals, or by omitting any such method which is mentioned in that sub-section.

(5) In any proceedings for an offence under this section the animal in question shall be presumed to have been a wild animal unless the contrary is shown.

(6) In any proceedings for an offence under sub-section (2) it shall be a defence for a person charged thereunder to show that the article was set in position for the purpose of killing or taking in accordance with a licence granted under section 13(2), any wild animals which could be lawfully killed or taken by those means and that he took or caused to be taken all reasonable precautions to prevent injury thereby to any wild animals of a kind specified in Schedule 1.

Protection of wild plants.

11.(1) Subject to the provisions of this Part, if any person intentionally picks, cuts, uproots or destroys any wild plant (other than a plant specified in Schedule 2) otherwise than in accordance with the licence granted under section 13 he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person—

1991-11

Nature Protection

- (a) sells, offers or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild plant (other than a plant specified in Schedule 2), or any part of, or anything derived from, such a plant; or
- (b) publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things,

he shall be guilty of an offence.

(3) Notwithstanding anything in sub-section (1), a person shall not be guilty of an offence by reason of any act made unlawful by that sub-section if he shows that the act was an incidental result of a lawful operation and could not reasonably have been avoided.

(4) In any proceedings for an offence under sub-section (1) or (2)(a), the plant in question shall be presumed to have been a wild plant unless the contrary is shown.

Introduction of new species of animals or plants.

12.(1) Subject to the provisions of this Part, if any person releases or allows to escape into the wild any animal which is of a kind which is not ordinarily resident in and is not a regular visitor to Gibraltar in a wild state, he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person plants or otherwise causes to grow in the wild any plant which does not ordinarily grow in the wild in Gibraltar, he shall be guilty of an offence.

(3) Subject to sub-section (4), it shall be a defence to a charge of committing an offence under sub-section (1) or (2) to prove that the accused took all reasonable steps and exercised all diligence to avoid committing the offence.

- (4) Where the defence provided by sub-section (3) involves an allegation that the commission of the offence was due to the act or default by another person, the person charged shall not, without leave of the Court, be entitled to rely on the defence unless, within a period ending 7 clear days before the hearing, he has served on the prosecutor a notice giving such information identifying or assisting in the identification of the other person as was then in his possession.

Introduction of new species of birds.

12A.(1) A person who without a permit issued by the Minister under this section releases into the wild any bird which is of a kind which is not ordinarily resident in and is not a regular visitor to Gibraltar in a wild state is guilty of an offence.

(2) Subject to subsection (3), it shall be a defence to a charge of committing an offence under subsection (1) to prove that the accused took all reasonable steps and exercised all diligence to avoid committing the offence.

(3) Where the defence provided by subsection (2) involves an allegation that the commission of the offence was due to the act or default of another person, the person charged shall not, without leave of the Court, be entitled to rely on the defence unless, within a period ending 7 clear days before the hearing, he has served on the prosecutor a notice giving such information identifying or assisting in the identification of the other person as was then in his possession.

(4) Where a person applies to the Minister for a permit under this section the Minister shall—

- (a) consider whether the introduction of that species will be prejudicial to flora and fauna; and
- (b) consult the European Commission,

and thereafter may issue a permit subject to such terms and conditions as he deems necessary.

Power to grant licences.

13.(1) Sections 3,4,5,6(2) and 7 do not apply to anything done—

- (a) for scientific or educational purposes;
- (b) for the purpose of ringing or marking, or examining any ring or mark on, wild birds;
- (c) for the purpose of conserving wild birds;
- (d) for the purpose of tending a disabled wild bird and releasing it when no longer disabled;
- (e) for the purposes of preserving public health or public or air safety;
- (f) for the purpose for preventing the spread of disease;

1991-11

Nature Protection

- (g) for the protection of flora and fauna;
- (h) for the purposes of the re-population or re-introduction of wild birds, including any breeding necessary for those purposes;
- (i) for such other purpose as may be prescribed by regulations,

where there is no other satisfactory solution, and if it is done under and in accordance with the terms of a licence granted by the Government after consultation with the Nature Conservancy Council.

(2) Sections 8(1), (2) and (4), 10(1) and (2) and 11(1) do not apply to anything done—

- (a) for scientific or educational purposes;
- (b) for the purpose of ringing or marking, or examining any ring or mark on, wild animals;
- (c) for the purpose of conserving wild animals or wild plants or introducing them to particular areas;
- (d) for the purpose of preserving public health or public safety;
- (e) for the purpose of preventing the spread of disease;
- (f) for such other purpose as may be prescribed by regulations,

if it is done under and in accordance with the terms of a licence granted by the Government after consultation with the Nature Conservancy Council.

(3) Subject to sub-section (4), a licence under the foregoing provisions of this section—

- (a) may be, to any degree, general or specific;
- (b) may be granted either to persons of a class or to a particular person;
- (c) may be subject to compliance with any specified conditions;
- (d) may be modified or revoked at any time by the Government after consultation with the Nature Conservancy Council; and
- (e) subject to paragraph (d), shall be valid for the period stated in the licence;

and the Government may charge therefor such reasonable sum (if any) as he may determine.

(4) A licence under sub-sections (1) or (2) which authorises any person to kill wild birds or wild animals shall specify the area within which the methods by which the wild bird or wild animals may be killed.

(5) No licence may be granted under this section which may have the effect of causing the extinction in Gibraltar of any wild birds, wild animals or wild plants specified in Schedule 3.

(6) A licence granted for the purpose of allowing disabled wild birds to be tended shall specify the arrangements to be made for registering with the Nature Conservancy Council any bird so tended and for recording the release or otherwise of such bird.

(6A) Notwithstanding any provision, limitation or condition that may be imposed on a licence issued under this section, where the licence to be issued is in respect of a wild bird, the licence must specify—

- (a) the species which are covered by the licence;
- (b) the means, arrangements or methods authorised for capture or killing;
- (c) the conditions of risk and the circumstances of time and place under which the licensed activity may be undertaken;
- (d) the authority empowered to declare that the required conditions obtain and to decide what means, arrangements or methods may be used, within what limits and by whom; and
- (e) the controls which will be carried out.

(7) Notwithstanding the provisions of this section the Government shall grant to a public officer such licence as may be necessary to enable that officer to carry out his duties under any other Act.

Implementation reports.

13A.(1) The Minister shall annually send a report to the European Commission regarding the implementation of Article 9(1) and (2) of the Wild Birds Directive in the preceding year.

(2) The Minister shall, in accordance with the timescales set out in Article 12(1) of the Wild Birds Directive, send a report to the European Commission regarding the implementation of the Directive in the preceding reporting period.

False statements made for obtaining a licence.

14. A person who, for the purposes of obtaining, whether for himself or another, the grant of a licence under section 13–

- (a) makes a statement or representation, or furnishes a document or information, which he knows to be false in a material particular; or
- (b) recklessly makes a statement or representation, or furnishes a document or information, which is false in a material particular, shall be guilty of an offence.

Attempts to commit offences.

15.(1) Any person who attempts to commit an offence under the foregoing provisions of this Part, shall be guilty of an offence and shall be punishable in like manner as for the said offence.

(2) Any person who for the purposes of committing an offence under the foregoing provisions of the Part, has in his possession anything capable of being used for committing the offence, shall be guilty of an offence and shall be punishable in like manner as for the said offence.

Enforcement.

16. If a Police officer or a person appointed for the purpose of enforcing this Act under section 21 suspects with reasonable cause that any person is committing or has committed an offence under this Part, the officer or person appointed may without warrant–

- (a) stop and search that person;
- (b) search or examine any thing or vehicle which that person may then be using or have in his possession;
- (c) seize and detain for purposes of proceedings under this Part, anything which may be evidence of the commission of the offence or may be liable to be forfeited under section 17.

Penalties, forfeitures etc.

17.(1) Subject to sub-section (3), a person guilty of an offence under sections 3, 5, 6, 8, 10, 11 or 15 shall be liable–

- (a) on summary conviction to a fine at level 5 on the standard scale or 6 months imprisonment or both; or

- (b) on conviction on indictment to imprisonment for 2 years and to a fine.

(2) Subject to sub-section (3), a person guilty of an offence under sections 7, 12, 12A or 14 shall be liable on summary conviction to a fine at level 4 on the standard scale or 6 months imprisonment or to both.

(3) Where an offence to which sub-sections (1) or (2) applies was committed in respect of more than one bird, nest, egg, other animal, plant or other thing, the fine which may be imposed under that subsection shall be determined as if the person convicted had been convicted of a separate offence in respect of each bird, nest, egg, animal, plant or thing.

(4) The Court by which any person is convicted of an offence under this Part—

- (a) shall order the forfeiture of any bird, nest, egg, other animal, plant or thing in respect of which the offence was committed; and
- (b) may order the forfeiture of any vehicle, animal, weapon or other thing which was used to commit the offence and, in the case of an offence under section 12, any animal or plant which is of the same kind as that in respect of which the offence was committed and was found in his possession.

PART IIA

DESIGNATION OF SITES, ETC.

Application etc..

17A. (1) This Part makes provision for the purpose of transposing into the law of Gibraltar the Habitats Directive and the Wild Birds Directive.

(2) Where this Act creates a function (including a power or duty) to be carried out by any person, that person shall carry out that function so as to secure compliance with the Habitats Directive, the Wild Birds Directive or both, as the case may be.

Designation of sites under the Habitats Directive

Selection of sites eligible for identification as of Community importance.

Nature Protection

17B. (1) On the basis of the criteria set out in Annex III (Stage 1) to the Habitats Directive, and relevant scientific information, the Minister shall propose a list of sites indicating with respect to each site —

- (a) which natural habitat types in Annex I to the Directive the site hosts, and
- (b) which species in Annex II to the Directive that are native to Gibraltar the site hosts.

(2) Where appropriate after having carried out surveillance of the conservation status of the natural habitats and species in Gibraltar the Minister may propose modification of the list in the light of the results of the surveillance.

(3) The list shall be transmitted to the Secretary of State for sending to the Commission as soon as practicable together with information on each site including—

- (a) a map of the site,
- (b) its name, location and extent, and
- (c) the data resulting from application of the criteria specified in Annex III (Stage 1),

provided in a format established by the Commission.

Adoption of list of sites: designation of special areas of conservation.

17C.(1) Once a site of Community importance in Gibraltar has been adopted in accordance with the procedure laid down in paragraph 2 of Article 4 of the Habitats Directive, the Minister shall designate that site as a special area of conservation as soon as possible and within six years at most.

(2) The Minister shall establish priorities for the designation of sites in the light of—

- (a) the importance of the sites for the maintenance or restoration at a favourable conservation status of —
 - (i) a natural habitat type in Annex I to the Habitats Directive, or
 - (ii) a species in Annex II to the Directive,

and for the coherence of Natura 2000; and

- (b) the threats of degradation or destruction to which those sites are exposed.

(3) In this section “Natura 2000” means the European network of special areas of conservation and special protection areas under the Wild Birds Directive provided for in Article 3(1) of the Habitats Directive.

Consultation as to inclusion of site omitted from the list.

17D. If consultation is initiated by the Commission in accordance with Article 5(1) of the Habitats Directive with respect to a site in Gibraltar hosting a priority natural habitat type or priority species and—

- (a) the Minister agrees that the site should be added to the list transmitted in accordance with section 17B, or
- (b) the Council, acting on a proposal from the Commission in pursuance of paragraph 2 of Article 5 of the Habitats Directive, so decides,

the site shall be treated as added to the list as from the date of that agreement or decision.

Designation of sites under the Wild Birds Directive

Designation of special protected areas.

17DA.(1) Subject to subsection (2) the Minister must by order, and for the purposes set out in Article 3 of the Wild Birds Directive, designate areas (special protected areas or SPA’s) for the protection of—

- (a) the species of birds listed in Annex I to the Wild Birds Directive in accordance with, and to the extent required by, Article 4(1) of that Directive; and
- (b) regularly occurring migratory species not listed in Annex I of the Wild Birds Directive bearing in mind their breeding, moulting and wintering areas and staging posts along their migration routes in accordance with, and to the extent required by, Article 4(2) of that Directive.

(2) In designating a special protection area under subsection (1) and the extent of any such site, the Minister shall have regard to—

- (a) the need to give effect to the measures set out in Article 3(2) of the Wild Birds Directive, and in particular subparagraphs (c) and (d) thereof which set requirements on the re-establishment of destroyed biotopes and on the creation of biotopes; and

- (b) the extent to which the site shall include BGTW.

Information to be sent to the European Commission.

17DB. Where a special protected area has been designated under section 17DA the Minister shall cause all relevant information pertaining to the designation to be sent to the European Commission for the purposes set out in Article 4(3) of the Wild Birds Directive.

European Sites

Meaning of “European site” and “European Marine site”.

17E. (1) In this Act a “European site” means—

- (a) a special area of conservation,
- (b) a site of Community importance which has been placed on the list referred to in the third sub-paragraph of Article 4(2) of the Habitats Directive,
- (c) a site hosting a priority natural habitat type or priority species in respect of which consultation has been initiated under Article 5(1) of the Habitats Directive, during the consultation period or pending a decision of the Council under Article 5(3), or
- (d) an area classified pursuant to section 17DA,
- (e) where an Order under section 2B so provides, an area designated under that section.

(2) In this Act a European marine site means a European site which consists of, or so far as it consists of, marine areas.

Notice to landowners, relevant persons, etc..

17F. (1) As soon as practicable after a site is designated as a European site, or ceases to be so designated, or there is any change in the designation the Minister shall give notice of this to—

- (a) every owner or occupier of land within the site;
- (b) the Nature Conservancy Council; and
- (c) such other persons or bodies as it may determine.

(2) A notice required to be issued by virtue of sub-section (1) shall be accompanied by a copy of the document by which the site has been designated as a European site in so far as it relates to land owned or occupied by or, as the case may be, to land within the area of responsibility of the person or body to whom the notice is given.

(3) The Government may make rules as to the form and content of notices to be given under this section.

Management agreements.

17G.(1) The Nature Conservancy Council shall enter into an agreement (a “management agreement”) with every owner, lessee and occupier of land forming part of a European site, or land adjacent to such a site, for the management, conservation, restoration or protection of the site, or any part of it with the purpose of attaining the objectives of the Habitats Directive or the Wild Birds Directive, as the case may be.

(2) A management agreement may impose such restrictions as may be expedient for the purposes of the agreement on the exercise of rights over the land by the persons who can be bound by the agreement.

(3) A management agreement—

- (a) may provide for the management of the land in such manner, the carrying out thereon of such work and the doing thereon of such other things as may be expedient for the purposes of the agreement;
- (b) may provide for any of the matters mentioned in paragraph (a) being carried out, or for the costs thereof being defrayed, either by the said owner or other person or by the Nature Conservancy Council, or partly in one way and partly in another;
- (c) may contain such other provisions as to the making of payments by the Nature Conservancy Council, and in particular for the payment by the Council of compensation for the effect of the restrictions mentioned in sub-section (2) as may be specified in the agreement.

(4) Where land is subject to a management agreement, the Nature Conservancy Council shall, as respects the enforcement of the agreement against persons other than the original contracting party, have the like rights as if—

1991-11

Nature Protection

- (a) they had at all material times been the absolute owners in possession of ascertained land adjacent to the land subject to the agreement and capable of being benefited by the agreement; and
- (b) the management agreement had been expressed to be for the benefit of that adjacent land.

Management Agreements: determination by Minister.

17GA.(1) Where the Nature Conservancy Council is unable to conclude a management agreement under section 17G it must notify the Minister in writing setting out—

- (a) the names and addresses of the parties (including any person who claims to be entitled to be a party to any agreement);
- (b) the terms of the proposed agreement;
- (c) the terms of the agreement which are agreed;
- (d) the terms of the agreement which are not agreed, including the reasons why, in the view of the Nature Conservancy Council, agreement of those terms has not been possible.

(2) Upon receipt of the notice the Minister shall give the parties, identified to him pursuant to subsection (1)(a) and any other person whom the Minister deems ought to be given an opportunity to make representations, up to 28 days in which to respond to his request for their views as to why an agreement cannot be reached and how it is proposed that the issues be resolved.

(3) After receipt of any matters brought to the Minister's attention, or the expiry of 28 days (whichever is the earlier), the Minister shall, on the basis of the information before him and after having considered any duties that may arise in connection with the obligations arising from the Habitats Directive, the Wild Birds Directive or both Directives, issue a determination which shall be binding on all the parties to whom it is addressed.

(4) A determination under this section shall, for the purposes of this Act, be deemed to be an agreement under section 17G and, subject to an appeal being made under section 17GB, shall be deemed to be enforceable 21 days after it has been made.

Appeal to the Magistrates' Court.

17GB.(1) A person to whom a determination under section 17GA is addressed may within 14 days of receipt of the determination appeal against any part of the determination to the Magistrates' Court.

(2) Upon hearing an appeal the Magistrates' Court may uphold, substitute, vary or quash the Minister's determination but in so doing it may not impose anything that conflicts with the provisions of the Habitats or Wild Birds Directives.

(3) There shall be no appeal from the decision of the Magistrates' Court except on a point of law.

Notification of potentially damaging operations.

17H.(1) Any designation made under section 17C(1) or section 17DA(1) in relation to a European site may specify—

- (a) the flora, fauna, or geological or physiographical features by reason of which the land is of special interest, and
- (b) any operations appearing to the Nature Conservancy Council to be likely to damage that flora or fauna or those features.

(2) The Minister may, for the purpose of securing compliance with the requirements of the Habitats Directive and/or the Wild Birds Directive, at any time amend the designation with respect of any of the matters mentioned in sub-section (1) and shall notify those persons to whom he gave notification of the original designation of the amendment.

Restriction on carrying out operations specified in notification.

17J.(1) The owner or occupier of any land within a European site shall not carry out, or cause or permit to be carried out, on that land any operation specified in relation to the site under section 17H unless—

- (a) one of them has given the Nature Conservancy Council written notice of a proposal to carry out the operation, specifying its nature and the land on which it is proposed to carry it out, and
 - (b) one of the conditions specified in sub-section (2) is fulfilled.
- (2) The conditions referred to in sub-section (1)(b) are—
- (a) that the operation is carried out with the written consent of the Nature Conservancy Council;
 - (b) that the operation is carried out in accordance with the terms of a management agreement.

(3) A person who, without reasonable excuse, contravenes sub-section (1) commits an offence and is liable on summary conviction to a fine at level 4 on the standard scale.

(4) For the purposes of sub-section (3) it is a reasonable excuse for a person to carry out an operation—

- (a) that the operation was an emergency operation particulars of which (including details of the emergency) were notified to the Nature Conservancy Council as soon as practicable after the commencement of the operation; or
- (b) that the operation was authorised by a planning permit granted on an application under the Town Planning Act.

Supplementary provisions as to consents.

17K.(1) Where it appears to the Nature Conservancy Council that an application for consent given in accordance with section 17J(2)(a) relates to an operation which is or forms part of a plan or project which —

- (a) is not directly connected with or necessary to the management of the site, and
- (b) is likely to have a significant effect on the site (either alone or in combination with other plans or projects),

the Council shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

(2) In the light of the conclusions of the assessment, the Nature Conservancy Council may give consent for the operation only after having ascertained that the plan or project will not adversely affect the integrity of the site.

(3) The Nature Conservancy Council shall give notice of its decision in respect of an application for consent to the owner and the occupier of the land to which the application relates and where the Nature Conservancy Council does not give consent for the operation the Council shall give to those persons reasons for its decision.

(4) The owner or the occupier of the land in question may—

- (a) within two months of receiving notice of the refusal of consent, or

- (b) if no notice of a decision is received by him within three months of an application for consent being made,

by notice in writing to the Nature Conservancy Council require the Council to refer the matter forthwith to the Minister.

(5) If on the matter being referred to the Minister he is satisfied that, there being no alternative solutions, the plan or project should be carried out for imperative reasons of overriding public interest (which, subject to sub-section (6), may be of a social or economic nature), he may direct the Nature Conservancy Council to give consent to the operation.

(6) Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred in sub-section (5) shall be either—

- (a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment, or
- (b) other reasons which in the opinion of the European Commission are imperative reasons of overriding public interest.

(7) Where the Minister directs the Nature Conservancy Council to give consent under this section, he shall secure that such compensatory measures are taken as are necessary to ensure that the overall coherence of Natura 2000 is protected.

(8) This section does not apply in relation to a site which is a European site by reason only of section 17E(1)(c).

Provisions as to existing notices and consents.

17L.(1) Any notice or consent previously given under section 18 in relation to land which on or after the commencement of this Part becomes land within a European site shall have effect, subject to the provisions of this section, as if given in accordance with section 17J(1)(a) or (2)(a).

(2) The Minister shall review any such consent as is referred to in sub-section (1) to assess its compatibility with the conservation objectives of the site, and—

- (a) to the extent that it is not so compatible may modify the consent, or
- (b) if in the opinion of the Minister the consent cannot by modification be made compatible with the conservation objectives of the site, may withdraw it.

(3) Notice of any such modification or withdrawal of consent shall be given to every owner and occupier of land within the site who in the opinion of the Nature Conservancy Council may be affected by it, and the modification or withdrawal shall come into effect in relation to an owner or occupier upon such notice being given to him.

(4) The modification or withdrawal of a consent shall not affect anything done in reliance on the consent before the modification or withdrawal takes effect.

Power to make special nature conservation order.

17M. (1) The Minister may, after consultation with the Nature Conservancy Council make in respect of any land within a European site or marine area within a European marine site a special nature conservation order specifying operations which appear to it to be likely to destroy or damage the flora, fauna, or geological or physiographical features by reason of which the land is a European site or in relation to the sea a European marine site.

(2) A special nature conservation order may be amended or revoked by a further order.

(3) Schedule 4 has effect with respect to the making, amending or revoking of special nature conservation orders.

Restriction on carrying out operations specified in a special nature conservation order.

17N.(1) No person shall carry out on any land within a European site in respect of which a special nature conservation order is in effect any operation specified in the order, unless the operation is carried out, or caused or permitted to be carried out, by the owner or occupier of the land and—

(a) one of them has, after the making of the order, given the Nature Conservancy Council written notice of a proposal to carry out the operation, specifying its nature and the land on which it is proposed to carry it out, and

(b) one of the conditions specified in sub-section (2) is fulfilled.

(2) The conditions referred to in sub-section (1)(b) are—

(a) that the operation is carried out with the written consent of the Nature Conservancy Council;

(b) that the operation is carried out in accordance with the terms of a management agreement.

(3) A person who, without reasonable excuse, contravenes sub-section (1) commits an offence and is liable—

(a) on summary conviction, to a fine at level 5 on the standard scale;

(b) on conviction on indictment, to a fine.

(4) For the purposes of sub-section (3) it is a reasonable excuse for a person to carry out an operation—

(a) that the operation was an emergency operation particulars of which (including details of the emergency) were notified to the Nature Conservancy Council as soon as practicable after the commencement of the operation; or

(b) that the operation was authorised by a planning permit granted on an application under the Town Planning Act.

Supplementary provisions as to consents.

17P.(1) Where it appears to the Nature Conservancy Council that an application for consent in accordance with section 17N(2)(a) relates to an operation which is or forms part of a plan or project which—

(a) is not directly connected with or necessary to the management of the site, and

(b) is likely to have a significant effect on the site (either alone or in combination with other plans or projects),

the Council shall make an appropriate assessment of the implications for the site in view of the conservation objectives the Council considers appropriate to that site.

(2) In the light of the conclusions of the assessment referred to in sub-section (1), the Nature Conservancy Council may give consent for the operation only after having ascertained that the plan or project will not adversely affect the integrity of the site.

(3) The Nature Conservancy Council shall give notice of its decision in respect of an application for consent to the person making that an application and where the Nature Conservancy Council does not give consent for the operation the Council shall give to that person reasons for its decision.

Nature Protection

(4) The owner or occupier, as the case may be, of the land in question may—

- (a) within two months of receiving notice of the refusal of consent, or
- (b) if no notice of a decision is received by him within three months of an application for consent being made,

by notice in writing to the Nature Conservancy Council require the Council to refer the matter forthwith to the Minister.

(5) If on the matter being referred to the Minister he is satisfied that, there being no alternative solutions, the plan or project should be carried out for imperative reasons of overriding public interest (which, subject to subsection (6), may be of a social or economic nature), he may direct the Nature Conservancy Council to give consent to the operation.

(6) Where the site concerned hosts a priority natural habitat type, a priority species or a wild bird of European origin falling within Article 4(1)(a) to (d) of the Wild Birds Directive, the reasons referred to in subsection (5) shall be either—

- (a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment, or
- (b) other reasons which in the opinion of the European Commission are imperative reasons of overriding public interest.

(7) Where the Minister directs the Nature Conservancy Council to give consent under this section, he shall secure that such compensatory measures are taken as are necessary to ensure that the overall coherence of Natura 2000 is protected.

(8) This section does not apply in relation to a site which is a European site by reason only of section 17E(1)(c).

Prevention of deterioration.

17PA. (1) Where the natural habitat or the habitat of a species for which a site has been designated a European site or a European marine site is or has been polluted, has deteriorated, is deteriorating or is likely to deteriorate, the Government must make an order specifying the steps which are to be taken in order to remedy or prevent that pollution or deterioration in so far as such pollution or deterioration has been or could be significant in relation to the

objectives of the Habitats Directive or the Wild Birds Directive, as the case may be.

(1A) In considering deterioration under subsection (1) no regard shall be had as to whether such deterioration arises as a consequence of human activity or from a failure to act.

(2) An order under subsection (1) shall be addressed to the owner or occupier of land within such a site or where the pollution or deterioration was caused, results from or is likely to arise as a result of an operation outside that site, to the person who undertook, is or will be undertaking that operation.

(3) An order under subsection (1) shall state the time for compliance with the terms of the order.

(4) An order under subsection (1) shall be consistent with but shall not exceed the obligations under Article 6(2) of the Habitats Directive, or Article 4(4) of the Wild Birds Directive.

(5) A person to whom an order is addressed and who within the time stated in the order fails to comply with a provision of that order is guilty of an offence and is liable on summary conviction to a fine not exceeding level 5 on the standard scale and to a further fine not exceeding level 3 on the standard scale for every day or part of every day in respect of which the order has not been complied with.

(6) Upon receipt of representations from a person who is affected by or has an interest in an order made under subsection (1) the Government may subject to subsection (4) amend, vary or revoke that order.

European Marine Site.

17Q.(1) The Minister may install markers indicating the existence and extent of a European marine site.

(2) As soon as possible after a site becomes a European marine site, the Minister shall publish in the Gazette—

- (a) the conservation objectives for that site, and
- (b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated.

Management scheme for European Marine Site.

1991-11

Nature Protection

17R.(1) The Minister may by notice in the Gazette establish a management scheme for a European marine site.

- (2) The scheme may, in particular—
- (a) appoint the Nature Conservancy Council to co-ordinate the establishment of the scheme;
 - (b) set time limits within which any steps by the Nature Conservancy Council are to be taken;
 - (c) require the Nature Conservancy Council to supply to the Minister such information concerning the establishment of the scheme as may be specified in the notice.

(3) The Government may amend a management scheme for a European marine site, either generally or in any particular respect.

Surveillance

Surveillance of conservation status of habitats and species.

17RA.(1) The Minister must make arrangements for the surveillance of the conservation status of—

- (a) natural habitats of Community interest;
- (b) species of Community interest; and
- (c) wild birds listed in Annex I to the Wild Birds Directive,

and in particular, the priority natural habitat types and the priority species.

(2) The surveillance measures under subsection (1) shall be carried out systematically and on a permanent basis and the extent of the surveillance required shall have regard to—

- (a) whether the habitat or species is a priority natural habitat type or priority species;
- (b) the conservation status of the habitat or species; and
- (c) the extent, if any, to which that conservation status is under threat.

(3) The Minister must ensure that the surveillance under subsection (1) is made available to the public via electronic or other means.

*Protection of animals***Protection of certain animals from exploitation.**

17RB.(1) The Minister must, as required, in the light of information derived from the surveillance arranged under section 17RA or otherwise arranged for the purpose of Article 11 of the Habitats Directive, ensure that measures are taken to ensure that—

- (a) the taking in the wild of specimens of a species of animal listed in Annex V to the Habitats Directive; and
- (b) the exploitation of such specimens,

is compatible with that species being maintained at a favourable conservation status.

(2) Where measures are required under subsection (1), the Minister must make arrangements for surveillance for the purpose of establishing whether the taking in the wild of specimens of the species concerned, and the exploitation of specimens of that species, are compatible with it being maintained at a favourable conservation status.

17S. *Repealed.*

Protection of certain wild animals.

17T.(1) It is an offence—

- (a) deliberately to capture injure or kill a wild animal of a European protected species;
- (b) deliberately to disturb such an animal—
 - (i) if the disturbance is such as is likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young, hibernate or migrate; or
 - (ii) if the disturbance significantly affects the local distribution or abundance of the species to which it belongs;
- (c) deliberately to take or destroy the eggs of such an animal; or
- (d) to damage or destroy a breeding site or resting place of such an animal.

(2) It is an offence for any person—

1991-11

Nature Protection

- (a) to have in his possession or control;
- (b) to transport;
- (c) to sell or exchange; or
- (d) to offer for sale or exchange,

anything to which subsection (3) applies.

(3) This subsection applies to—

- (a) any live or dead animal or part of an animal—
 - (i) which has been taken from the wild; and
 - (ii) which is of a species or subspecies listed in Annex IV(a) to the Habitats Directive; and
- (b) to any part of, or anything derived from, such an animal or such a part of an animal.

(4) The offences in subsections (1) and (2) apply to all stages of the life of the animals to which they apply.

(5) Subject to subsection (6), a person shall not be guilty of an offence under subsection (2) if he shows that the animal or part of the animal in question, or the animal or part of the animal from which the part or the thing in question is derived, was lawfully taken from the wild.

(6) The defence under subsection (5) does not apply—

- (a) in the case of the offences in subsection (2)(a) and (b) if—
 - (i) the animal in question is an animal of a European protected species or the part or thing in question is derived from such an animal; and
 - (ii) that the animal, part or thing in question was in the defendant's possession, or transported by the defendant, for the purpose of sale or exchange;
- (b) in the case of the offences in subsection (2)(c) and (d) if the animal in question is an animal of a European protected species or the part or thing in question is derived from such an animal.

(7) For the purposes of subsection (5) an animal, or part of an animal, shall be treated as having been lawfully taken from the wild if—

- (a) it was taken from the wild in the European territory of a member State to which the EC Treaty applies, without contravention of the law of that member State and before the implementation date; or
- (b) it was taken from the wild elsewhere.

(8) A person shall not be guilty of an offence under subsection (2) if he shows that the animal, or the animal from which the part or thing in question is derived is of a species listed in Annex IV(a) to the Habitats Directive and—

- (a) was from a population occurring in a country or area which appears next to the name of that species in that Annex;
- (b) is of the species *Capra aegagrus* and was not from a naturally occurring population;
- (c) is of the subspecies *Ovis gmelini musimon* and was not from a naturally occurring population in Corsica or Sardinia; or
- (d) is of the species *Coregonus oxyrinchus* and either was from Finland or was not from an anadromous population.

(9) Unless the contrary is shown, in any proceedings under subsection (1) the animal in question is presumed to have been a wild animal.

(10) In any proceedings under subsection (2) it is to be presumed unless the contrary is shown—

- (a) that the animal in question was taken from the wild;
- (b) that the part of an animal in question is from an animal which was taken from the wild or that it was taken from the wild; or
- (c) the thing in question (if it is not part of an animal) was derived from an animal taken from the wild.

(11) A person guilty of an offence under this section is liable on summary conviction to a fine not exceeding level 5 on the standard scale.

(12) In deciding upon the sentence for a person convicted of an offence under subsection (1)(d), the court shall in particular have regard to whether that person could reasonably have avoided the damage to or destruction of the breeding site or resting place concerned.

(13) In this section—

“the EC Treaty” means the Treaty establishing the European Community;

“the implementation date” means—

- (a) where the relevant State became a member State before 10th June 1994, the 10th June 1994; and
- (b) in any other case, the date on which the relevant State became a member State;

“relevant State” means the State in whose territory the animal, or part of it, was taken from the wild.

Exceptions from section 17T.

17U.(1) A person shall not be guilty of an offence under section 17T(1) of deliberately capturing a wild animal of a European protected species, or an offence under section 17T(2)(a) or (b) if he shows that the contravention in question—

- (a) was in relation to an animal that had been disabled otherwise than by his unlawful act; and
- (b) was done solely for one or more of the purposes of—
 - (i) tending and releasing it when no longer disabled; or
 - (ii) releasing it after it had been tended.

(2) A person shall not be guilty of an offence under section 17T(1) (a) or (b) or under 17T(2)(a) or (b) if he shows that the contravention in question—

- (a) was in relation to an animal that had been disabled otherwise than by his unlawful act and that there was no reasonable chance of it recovering; and
- (b) was done solely for one or more of the purposes of—
 - (i) ending the animal’s life; or
 - (ii) disposing of it (otherwise than by sale or exchange) as soon as practicable after it was dead.

(3) A person shall not be guilty of an offence under section 17T(1) by reason of the injuring of an animal of a European protected species if he shows that this was done solely for the purpose-

- (a) of taking a sample by virtue of section 13 or section 17Y; or
- (b) of taking a sample for the purpose of giving evidence in any criminal proceedings in respect of an offence under this Act or the Criminal Offences Act.

(4) A person shall not be guilty of an offence under section 17T(2)(a) or (b) if he shows that the contravention in question was done for the purposes of-

- (a) investigating whether an offence is being or has been committed;
- (b) bringing, conducting, or giving evidence in, any criminal proceedings in respect of any such offence; or
- (c) giving effect to an order under section 17.

(5) The defences in subsections (1) to (4) apply unless it is shown by the prosecution that the defendant's action did not satisfy the following conditions-

- (a) that there was no satisfactory alternative; and
- (b) that the action was not detrimental to the maintenance of the populations of the species concerned at a favourable status in their natural range.

Prohibition of certain methods of taking or killing wild animals.

17V. (1) This section applies in relation to the taking or killing of a wild animal-

- (a) of any of the species listed in Annex V(a) to the Habitats Directive, and to which Article 15 applies, whose natural range includes any area of Gibraltar, or
- (b) of a European protected species, where the taking or killing of such animals is permitted in accordance with this Part.

(2) It is an offence to use for the purpose of taking or killing any such wild animal as is referred to in sub-section (1)-

- (a) any of the means listed in sub-section (3) or (4), or

1991-11

Nature Protection

- (b) any form of taking or killing from the modes of transport listed in sub-section (5); or
 - (c) any other means of taking or killing which is indiscriminate and capable of causing the local disappearance of, or serious disturbance to, animals of a species referred to in subsection (1).
- (3) The prohibited means of taking or killing of mammals are the use of—
- (a) blind or mutilated animals used as live decoys;
 - (b) tape recorders;
 - (c) electrical and electronic devices capable of killing or stunning;
 - (d) artificial light sources;
 - (e) mirrors and other dazzling devices;
 - (f) devices for illuminating targets;
 - (g) sighting devices for night shooting comprising an electronic image magnifier or image converter;
 - (h) explosives;
 - (j) nets which are non-selective according to their principle or their conditions of use;
 - (k) traps which are non-selective according to their principle or their conditions of use;
 - (l) crossbows;
 - (m) poisons and poisoned or anaesthetic bait;
 - (n) gassing or smoking out;
 - (p) semi-automatic or automatic weapons with a magazine capable of holding more than two rounds of ammunition.
- (4) The prohibited means of taking or killing fish are the use of—
- (a) poison;

(b) explosives.

(5) The prohibited modes of transport are–

(a) aircraft;

(b) moving motor vehicles.

(6) A person guilty of an offence under this section is liable on summary conviction to a fine at level 5 on the standard scale.

Monitoring incidental capturing and killing.

17VA.(1) The Minister must, in accordance with the provisions of this section, establish a system to monitor the incidental capture and incidental killing, of animals of the species listed in Annex IV(a) to the Habitats Directive which takes place in Gibraltar.

(2) The system established under subsection (1) shall incorporate the following elements–

(a) the identification of the risks of incidental capture and incidental killing to which those species are subject (including the activities which give rise to such risks); and

(b) the maintenance of records of the instances of incidental capture or incidental killing of animals of those species resulting from–

(i) the surveillance undertaken under section 17RA or pursuant to Article 11 of the Habitats Directive;

(ii) the monitoring carried out under this section or pursuant to Article 12(4); and

(iii) any other sources.

(3) In establishing the monitoring system the Minister may have regard to–

(a) the risks identified under subsection (2)(a);

(b) the instances of incidental capture and incidental killing recorded under subsection (2)(b);

(c) whether the species is a priority species; and

Nature Protection

- (d) the conservation status of the species and the extent to which that conservation status is under threat.

(4) The Minister shall make available to the public the information obtained from monitoring under subsection (1) via electronic or other means.

Protection from incidental capture and killing.

17VB.(1) The Minister, as required, in the light of the information derived from the monitoring arranged under section 17VA or otherwise arranged for the purpose of Article 12(4) of the Habitats Directive, must make arrangements for further research for, or ensure that conservation measures are taken for, the purpose specified in subsection (2).

(2) The purpose referred to in subsection (1) is to ensure that the incidental capture and incidental killing of animals of a species listed in Annex IV(a) to the Habitats Directive does not have a significant negative impact on that species.

Minister may make Regulations.

17VC. The Minister may make regulations to implement or require the implementation of conservation measures to ensure that the incidental capture and incidental killing of animals of the species listed in Annex IV(a) to the Habitats Directive does not have a negative impact on the species concerned or for the implementation of sections 17VA and 17VB.

17W. *Repealed.*

Protection of plants

Protection of certain wild plants.

17X.(1) It is an offence deliberately to pick, collect, cut, uproot or destroy a wild plant of a European protected species.

(2) It is an offence for any person to—

- (a) have in his possession or control;
- (b) transport;
- (c) sell or exchange; or
- (d) offer for sale or exchange,

anything to which subsection (3) applies.

(3) This section applies to—

- (a) any live or dead plant, or part of a plant—
 - (i) which has been taken in the wild; and
 - (ii) which is of a species or subspecies listed in Annex II(b) (other than any bryophyte) or IV(b) to the Habitats Directive; and
- (b) to any part of, or anything derived from, such a plant or such part of a plant.

(4) The offences in subsections (1) and (2) apply to all stages of the biological cycle of the plants to which they apply.

(5) Subject to subsection (6) a person shall not be guilty of an offence under subsection (2) if he shows that the plant or part of the plant in question, or the plant or part of the plant from which the part or thing in question is derived, was lawfully taken in the wild.

(6) The defence in subsection (5) does not apply—

- (a) in the case of the offences in subsection 2(a) and (b) if—
 - (i) the plant in question is of a European protected species, or the part or thing in question is derived from such a plant; and
 - (ii) the plant, part or thing in question was in the defendant's possession or control, or transported by the defendant, for the purpose of sale or exchange;
- (b) in the case of the offences in subsection 2(c) and (d) if—
 - (i) the plant in question is of a European protected species; or
 - (ii) the part or thing in question is derived from such a plant.

(7) For the purposes of subsection (5) a plant, or part of a plant, shall be treated as having been lawfully taken in the wild if—

- (a) it was taken in the wild in the European territory of a member State to which the EC Treaty applies, without contravention of the law of that member State and before the implementation date; or

1991-11

Nature Protection

(b) it was taken in the wild elsewhere.

(8) A person shall not be guilty of the offence under subsection (1) of picking or cutting of a wild plant of a European protected species if he shows that this was done solely for the purpose—

- (a) of taking a sample by virtue of section 13 or section 17Y;
- (b) of taking a sample for the purpose of giving evidence in any criminal proceedings.

(9) A person shall not be guilty of an offence under section 17X(2)(a) or (b) if he shows that the contravention in question was done for the purposes of—

- (a) investigating whether an offence is being or has been committed;
- (b) bringing, conducting, or giving evidence in, any criminal proceedings in respect of any such offence; or
- (c) giving effect to an order under section 17.

(10) Unless the contrary is shown, in any proceedings under subsections (1) and (2), a plant or any part of it or anything derived from a plant shall be presumed to be or to have been a part of or derived from a plant taken from the wild.

(11) A person guilty of an offence under this section is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine not exceeding level 5 on the standard scale, or to both.

(12) In this section—

“the EC treaty” means the treaty establishing the European Community;

“the implementation date” means—

- (a) where the relevant State became a member State before 10th June 1994, the 10th June 1994; and
- (b) in any other case, the date on which the relevant State became a member State; and

“relevant State” means the State in whose territory the plant, or part of it, was taken in the wild.

*Trade in wild birds of European Origin***Protection of wild birds of European origin.**

17XA.(1) Subject to subsection (2) a person who sells or offers for sale, transports for sale or keeps for sale any live or dead wild birds of European origin or any readily recognisable parts or derivatives thereof is guilty of an offence and liable on summary conviction to a fine up to level 5 on the standard scale.

(2) It shall not be an offence for a person to carry out an act specified in subsection (1) if the bird—

- (a) is listed in Part A of Annex III to the Wild Birds Directive; and
- (b) has been captured, killed or otherwise acquired in another member State and in accordance with the laws of that member State.

(3) It shall not be an offence for a person to carry out an act specified in subsection (1) in respect of a wild bird that is listed in Part B of Annex III to the Wild Birds Directive if the Minister makes an order under this subsection to that effect.

(4) An order under subsection (3) may make provision for certain restrictions in the carrying out of the acts specified in subsection (1) and must only relate to birds that have been legally killed or captured or otherwise legally acquired.

(5) Where the Minister proposes to make an order under subsection (3) he must first consult the European Commission in accordance with the procedure set out in Article 6(3) of the Wild Birds Directive.

*Licences***Grant of licences for certain purposes.**

17Y. (1) Sections 17T, 17V, 17X and 17XA do not apply to anything done for any of the purposes mentioned in sub-section (2) under and in accordance with the terms of a licence granted by the Minister.

- (2) The purposes referred to in sub-section (1) are—
- (a) scientific or educational purposes;
 - (b) ringing or marking, or examining any ring or mark on, wild animals;

1991-11

Nature Protection

- (c) conserving wild animals or wild plants or introducing them to particular areas;
- (d) protecting any zoological or botanical collection;
- (e) preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- (f) preventing the spread of disease.

(2A) The Minister may grant a licence to permit the taking or the possession or control of specimens of any of the species listed in Annex IV to the Habitats Directive for a purpose not falling within subsection (2).

(2B) The Minister shall only grant a licence under subsection (2A) where he is satisfied that the grant of the licence would be compatible with the restrictions in Article 16(1)(e) of the Habitats Directive.

(2C) Sections 17T, 17V and 17X do not apply to anything done under and in accordance with the terms of a licence granted by the Minister under subsection (2A).

(3) The Minister shall not grant a licence under this section unless he is satisfied—

- (a) that there is no satisfactory alternative, and
- (b) that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

(4) The Minister shall from time to time consult with the Nature Conservancy Council as to the exercise of his functions under this section, and he shall not grant a licence of any description unless he has been advised by that Council as to the circumstances in which, in the opinion of the Council licences of that description should be granted.

Licences: supplementary provisions.

17Z. (1) Subject to the provisions of this section, a licence granted under section 17Y—

- (a) may be, to any degree, general or specific;
- (b) may be granted either to persons of a class or to a particular person; and

(c) may be subject to compliance with any specified conditions.

(1A) A licence granted under section 17Y(2A) shall be valid only in relation to such persons as are named in the licence.

(2) For the purposes of a licence under section 17Y the definition of a class of persons may be framed by reference to any circumstances whatever including, in particular, their being authorised by any other person.

(3) A licence under section 17Y may be modified or revoked at any time by the Minister but otherwise shall be valid for the period stated in the licence.

(4) A licence under section 17Y which authorises any person to kill wild animals shall specify the area within which and the methods by which the wild animals may be killed and shall not be granted for a period of more than two years.

(4A) A licence granted under section 17Y(2A) shall specify–

- (a) the species of animal or plant of the specimens which the person authorised by the licence may take or have in his possession or under his control;
- (b) the maximum number of specimens which the person authorised by the licence may take or have in his possession or under his control or which particular specimens that person may take or have in his possession or under his control;
- (c) the conditions subject to which the action authorised by the licence may be taken and in particular–
 - (i) the methods, means or arrangements by which the specimens may be taken or be in the possession or control of the person authorised by the licence;
 - (ii) when or over what period the action authorised by the licence may be taken; and
 - (iii) where it authorises any person to take specimens, the area from which they may be taken.

(5) The Government may by notice in the Gazette prescribe such reasonable fees (if any) as it may determine in respect of applications for and the grant of a licence under section 17Y, and for renewal or amendment of such a licence.

False statements made for obtaining licence.

17AA. (1) A person commits an offence who, for the purpose of obtaining, whether for himself or another, the grant of a licence under section 17Y—

- (a) makes a statement or representation, or furnishes a document or information, which he knows to be false in a material particular, or
- (b) recklessly makes a statement or representation, or furnishes a document or information, which is false in a material particular.

(2) A person guilty of an offence under this section is liable on summary conviction to a fine at level 4 on the standard scale.

Offence of breaching a licence condition.

17AB.(1) It is an offence for any person authorised by virtue of a licence to which subsection (4) applies to contravene or fail to comply with any condition which the licence requires him to comply with.

(2) A person shall not be guilty of an offence under subsection (1) if he shows—

- (a) that he took all reasonable precautions and exercised all due diligence to avoid the commission of the offence; or
- (b) that the commission of the offence was otherwise due to matters beyond his control.

(3) A person guilty of an offence under subsection (1) is liable on summary conviction to a fine up to level 4 on the standard scale or up to 3 months imprisonment.

(4) This section applies to a licence granted under section 17Y on or after 25 June 2007.

*Miscellaneous***General provisions for protection of European sites.**

17BB. (1) The Minister, or, as the case may be, a person empowered under any enactment to give any consent, permit or other authorisation for a plan or project or works or empowered to undertake a plan or project or carry out works shall if the plan, project or works —

- (a) is, or are, likely to have a significant effect on a European site (either alone or in combination with other plans or projects), and
- (b) is, or are, not directly connected with or necessary to the management of the site,

shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

(2) Without prejudice to the generality of sub-section (1), for the purpose of the Town Planning Act material considerations to be taken into account in granting permits shall include considerations which lead to improving the ecological coherence of the Natura 2000 network to encourage the management of features of the landscape which are of major importance for wild fauna and flora.

(3) A person applying for any consent, permit or other authorisation mentioned in sub-sections (1) or (2) shall provide such information as the Minister, or other person, as the case may be, may reasonably require for the purposes of the assessment.

(4) The Minister, or other person, as the case may be, shall for the purposes of the assessment consult the Nature Conservancy Council and have regard to any representations made by that Council within such reasonable time as the Minister, or other person, may specify.

(5) In the light of the conclusions of the assessment, and subject to section 17CC, the Minister or other person, as the case may be, shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site.

(6) In considering whether a plan or project will adversely affect the integrity of the site, the Minister, or other person, as the case may be, shall have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which he proposes that the consent, permission or other authorisation should be given.

(7) This section does not apply in relation to a site which is a European site by reason only of section 17E(1)(c).

Considerations of overriding public interest.

17CC.(1) If the Minister is satisfied that, there being no alternative solutions, the plan or project or works mentioned in section 17BB should be carried out for imperative reasons of overriding public interest (which, subject to sub-section (2), may be of a social or economic nature), he may

1991-11

Nature Protection

agree to the plan or project or works notwithstanding a negative assessment of the implications for the site.

(2) Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred to in sub-section (1) shall be either—

- (a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment, or
- (b) other reasons which in the opinion of the European Commission are imperative reasons of overriding public interest.

(3) Where a person having sufficient interest desires to obtain the opinion of the European Commission as to whether reasons are to be considered imperative reasons of overriding public interest, he shall submit a written request to the Government —

- (a) identifying the matter on which an opinion is sought, and
- (b) accompanied by any documents or information which may be required.

(4) The Government shall thereupon forward such request to the Secretary of State who may if he thinks fit, seek the opinion of the Commission, and if he does so, and sends the Commission's opinion to the Government, the Government shall make the opinion known to the person requesting the opinion.

Information for Commission.

17DD. (1) The Government shall as soon as practicable and thereafter as required by the timetable established under Article 23 of the Habitats Directive forward a report on the implementation of the Directive to the Secretary of State for onward transmission to the Commission.

(2) The report shall in particular include—

- (a) information concerning the conservation measures specified in Article 6(1) of the Habitats Directive;
- (b) an evaluation of the impact of those measures on the conservation status of the natural habitat types set out in Annex I, if appropriate, and the species referred to in Annex II of the Habitats Directive;

- (c) the main results of the surveillance carried out under section 17A(2) in compliance with obligations arising from Article II of the Habitats Directive.

PART IIB
APPROPRIATE ASSESSMENTS FOR LAND USE PLANS

Interpretation for Part IIB.

17EE.(1) In this Part—

“land use plan” includes a spatial development strategy, a development plan or a waste plan;

“plan-making authority” means a person or body that is required by virtue of an enactment to compile or give effect to a land use plan.

(2) References in this Part to giving effect to a land use plan include the publication, approval, adoption, revision or replacement of a land use plan.

Assessment of implications for European site or European marine site.

17FF.(1) Where a land use plan—

- (a) is likely to have a significant effect on a European site in or a European marine site (either alone or in combination with other plans or projects); and
- (b) is not directly connected with or necessary to the management of the site,

the plan-making authority for that plan shall, before the plan is given effect, make an appropriate assessment of the implications for the site in view of that site’s conservation objectives.

(2) The plan-making authority shall, for the purposes of any appropriate assessment relating to a European site or a European marine site consult the Nature Conservancy Council and shall take into account any representations made by that body within such reasonable time as the authority specifies.

(3) The plan-making authority shall also, if it considers it appropriate, take the opinion of the general public, and in doing so, shall take such steps for that purpose as it considers appropriate.

(4) In the light of the conclusions of the assessment, and subject to section 17GG, the plan-making authority shall give effect to the land use plan only after having ascertained that it will not significantly adversely affect the

integrity of the European site or the European marine site (as the case may be).

(6) This section does not apply in relation to a site which is a European site by reason only of section 17E(1)(c).

Considerations of overriding public interest.

17GG.(1) If the plan-making authority is satisfied that, there being no alternative solutions, the land use plan must be given effect to for imperative reasons of overriding public interest (which, subject to subsection (2), may be of a social or economic nature), it may give effect to the land use plan notwithstanding a negative assessment of the implications for the European site or the European marine site (as the case may be).

(2) Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred to in subsection (1) must be either—

- (a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or
- (b) any other reasons of overriding public interest provided the plan-making authority has had due regard to the opinion of the European Commission in satisfying itself that there are such reasons.

(3) Where a plan-making authority, other than the Government, desires to obtain the opinion of the European Commission as to whether reasons are to be considered imperative reasons of overriding public interest, it shall submit a written request to the Government—

- (a) identifying the matter on which an opinion is sought; and
- (b) accompanied by any documents or information which may be required.

(4) The Government may seek the opinion of the Commission and shall transmit the opinion to the plan-making authority.

(5) Where a plan-making authority other than the Government proposes to give effect to a land use plan under this section, it shall notify the Government.

(6) The plan-making authority shall not give effect to the land use plan before the end of the period of 21 days beginning with the day notified to it Government as that on which its notification was received, unless the Government notifies it that it may do so.

(7) Without prejudice to any other power, the Government may give directions to the plan-making authority in any such case prohibiting it from giving effect to the land use plan, either indefinitely or during such period as may be specified in the direction.

Compensatory measures.

17HH. Where in accordance with section 17GG a land use plan is given effect, notwithstanding a negative assessment of the implications for a European site or European marine site, the Government shall secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.

PART III
NATURE CONSERVATION.

Protection of habitats from pollution or deterioration.

18ZA.(1) The Minister must make an Order if a habitat is suffering from or is likely to suffer from pollution or deterioration and that habitat is not within a European Site within the meaning of Part IIA.

(2) An Order under subsection (1) shall provide for such measures to be taken as are necessary to prevent the pollution or deterioration of that habitat.

(3) An Order under subsection (1) may be addressed—

- (a) to the owner or occupier of the land upon which the pollution or deterioration arises from or in which the habitat is situated; or
- (b) to the person undertaking an activity that is or is likely to cause the pollution or deterioration of a habitat, irrespective of whether the activity is or will be carried out on land or at sea or both on land and at sea.

(4) An Order under this section may only be made if it is for the purposes of, and to the extent required for compliance with, the second sentence of Article 4(4) of the Wild Birds Directive.

Areas of special interest protected for the purpose of nature conservation etc.

18.(1) Subject to the provisions of sub-section (3) where the Government is of the opinion after consultation with the Nature Conservancy Council that an area of land not being a European site is of special interest—

1991-11

Nature Protection

- (a) by reason of any of its flora, fauna or geological or physiographical features;
- (b) by reason of being the habitat of any wild animal of a kind specified in Schedule 1 or wild plant (other than a plant specified in Schedule 2);
- (c) for the purpose of securing the survival in Gibraltar of any kind of wild animal of a kind specified in Schedule 1 or wild plant (other than a plant specified in Schedule 2);
- (d) for the purpose of complying with any international obligation;
- (e) for the purpose of providing under suitable conditions and control, special opportunities for the study of, and research into, matters relating to flora and fauna and the physical conditions in which they live, or the study of geological and geophysical features of special interest in the area,

it may by order designate that area to be a nature conservation area.

(2) Where the Government is of the opinion after consultation with the Nature Conservancy Council that any land covered (continuously or intermittently) by waters or parts of the sea within BGTW is of special interest for the purpose of—

- (a) conserving marine flora or fauna or geological or physiographical features of special interest in the area;
- (b) providing under suitable conditions and control, special opportunities for the study of, and research into, matters relating to marine flora and fauna and the physical conditions in which they live, or for the study of geological and physiographical features of special interest in the area;
- (c) for the purpose of complying with any international obligation;

it may by order designate such an area as a marine nature area.

(3) Subject to sub-section (4) no person shall carry out on any land to which this sub-section applies any operation which—

- (a) appears to the Government to be likely to destroy or damage the flora, fauna, or geological or physiographical features by reason of which the land is land which paragraph (a) or, as the case may be, paragraph (b) of sub-section (1) applies; and

(b) is specified in the order applying this sub-section to the land.

(4) Sub-section (3) shall not apply in relation to any operation carried out, or caused or permitted to be carried out, by the owner or occupier of the land if—

- (a) one of them has, after the commencement date, given the Nature Conservancy Council notice of a proposal to carry out the operation, specifying its nature and the land on which it is proposed to carry it out; and
- (b) the operation is carried out with the written consent of the Nature Conservancy Council.

(5) The Minister may, after consultation with the Nature Conservancy Council, make regulations for the protection of any area designated as a marine nature area under sub-section (2) and without prejudice to the generality of the foregoing such regulations may provide—

- (a) for prohibiting or restricting, either absolutely or subject to any exceptions—
 - (i) the entry into or movement within the area of persons and vessels;
 - (ia) fishing (including fishing from a vessel, spear fishing, shore-based fishing, bait collection and any other form of fishing), diving (including the use of self-contained underwater breathing apparatus and any form of surface demand apparatus that supplies air to a person underwater), undertaking a business as a dive operator, a sports fishing operator, or a dolphin tour operator or undertaking a fishing competition within the area;
 - (ii) the killing, taking, destruction, molestation or disturbance of animals or plants of any description in the area, or the doing anything therein which will interfere with the sea bed or damage or disturb any object in the area, or
 - (iii) the depositing of rubbish in the area;
- (b) for the issue, on such terms and subject to such conditions as may be specified in the regulations, of permits, approval or licences authorising entry into the area or the doing of anything which would otherwise be unlawful under the regulations; and

1991-11

Nature Protection

- (c) may be so made as to apply either generally or with respect to particular parts of the area or particular times of the year.
- (6) Nothing in the regulations made under sub-section (5) shall—
- (a) prohibit or restrict the exercise of any right of passage by a vessel other than a pleasure boat; or
- (b) prohibit, except with respect to particular parts of the area at particular times of the year, the exercise of any such right by a pleasure boat.
- (7) Nothing in regulations made under sub-section (5) shall make unlawful—
- (a) anything done for the purpose of securing the safety of any vessel, or of preventing damage to any vessel or cargo, or of saving life;
- (b) anything done more than 30 metres below the sea bed; or
- (c) the exercise by a relevant authority of any powers given to that authority under any enactment.
- (8) In this section “vessel” includes a hydrofoil, hovercraft and any aircraft capable of landing on water and “pleasure boat” shall be construed accordingly.
- (9) References in this section to birds, animals or plants of any description include references to eggs, seeds, spores, larva or other immature stages of birds, animals or plants of that description.

Penalties etc. in relation to nature conservation areas and marine nature areas.

- 19.(1) A person who, without reasonable excuse, contravenes sub-section (4) of section 18, shall be liable—
- (a) on summary conviction to a fine at level 4 on the standard scale or 3 months imprisonment or both;
- (b) on conviction on indictment to 2 years imprisonment and a fine.
- (2) Where an operation in respect of which a person is convicted of an offence under sub-section (1) has destroyed or damaged any part of the flora, fauna, or geological or physiographical features by reason of which the land on which it was carried out is of special interest, the Court

by which he is convicted, in addition to dealing with him in any way, may make an order requiring him to carry out, within such period as may be specified in the order, such operations for the purpose of restoring the land to its former condition as may be so specified.

(3) In the case of an order under sub-section (2) made by the Magistrates' Court, the period specified in the order shall not begin to run—

- (a) in any case until the expiration of the period for the time being prescribed by law for the giving of notice of appeal against the decision of the Magistrates' Court;
- (b) where notice of appeal is given within the period so prescribed, until the determination of the appeal.

(4) At any time before an order under sub-section (2) has complied with or fully complied with, the Court by which it was made may, on the application of the person against whom it was made, discharge or vary the order if it appears to the Court that a change in circumstance has made compliance or full compliance with the order impracticable or unnecessary.

(5) If, within the period specified in an order under this section, the person against whom it was made fails, without reasonable excuse, to comply with it, he shall be liable on summary conviction—

- (a) to a fine at level 4 on the standard scale or 3 months imprisonment or both; and
- (b) in the case of a continuing offence, to a further fine not exceeding one tenth of the maximum fine under (a) above for each day during which the offence continues after conviction.

(6) If, within the period specified in an order under this section, any operations specified in the order have not been carried out, the Nature Conservancy Council may enter the land and carry out these operations and recover from the person against whom the order was made any expenses reasonably incurred by them in doing so.

(7) Regulations made under section 18(6) may provide, in relation to offences created by those regulations—

- (a) on summary conviction for a fine not exceeding the maximum fine at level 4 on the standard scale and a period of imprisonment not exceeding 3 months;
- (b) on conviction on indictment for a period of imprisonment not exceeding 2 years and a fine.

Nature Protection

PART IV MISCELLANEOUS

Scientific Authorities.

20.(1) The Minister may by Regulations establish any body or bodies for the purpose of advising the Government in relation to any matter including but not limited to—

- (a) the environment;
- (b) terrestrial and aquatic flora and fauna;
- (c) the exploitation (whether commercial or otherwise) of the matters referred to in paragraphs (a) and (b).

(2) A body established under subsection (1) shall perform such duties as may be prescribed by regulations made thereunder.

(3) A reference in this Act to a scientific authority is a reference to a body which is established under subsection (1).

Wildlife Warden.

21.(1) The Government may, after consultation with the Nature Conservancy Council appoint by notice any person to be a Wildlife Warden or an honorary Wildlife Warden for the purposes of this Act.

(2) The Government may make regulations for the purpose of determining the powers and duties of any person appointed under subsection (1).

Promotion of research etc.

21A.(1) The Government shall take steps to encourage research and any other work that it considers is required as the basis for the protection, management and use of the populations of all wild bird species.

(2) In discharging the obligations set out in subsection (1), the Government shall have particular regard to the subjects that are listed in Annex V to the Wild Birds Directive, which is reproduced in Schedule 8 for information purposes.

(3) The Government shall ensure that the Commission is supplied with such information resulting from the discharge of its obligations under subsection (1) as is required for the Commission to coordinate research in relation to the protection, management and use of wild bird populations.

Offences by bodies corporate etc.

22.(1) Where body corporate is guilty of an offence under this Act and that offence is proved to have been committed with the consent or connivance of, or to be attributable to any neglect on the part of, any director, manager, secretary or other similar officer of the body corporate or any person who is purporting to act in any such capacity he, as well as the body corporate, shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

(2) Where the affairs of the body corporate are managed by its members, sub-section (1) shall apply in relation to the acts and defaults of a member in connection with his functions of management as if he were a director of the body corporate.

Amendment of Schedules.

23. The Minister may amend the Schedules by notice in the Gazette.

Regulations.

24. The Government may, after consultation with the Nature Conservancy Council, make regulations for carrying into effect the provisions of this Act and without prejudice to the generality of the foregoing such regulations may provide for—

- (a) fees or charges payable in respect of any application, licence or other document under this Act, or any other matter in the administration of this Act;
- (b) the forms or contents of applications, licences, registers and other documents required for the purposes of this Act;
- (c) the procedure to be followed for the establishment of a nature conservation area or a marine nature area;
- (d) the protection and regulation of (subject to the provisions of section 18) nature conservation areas and marine nature areas;
- (e) the powers and functions of Wildlife Wardens appointed under this Act,
- (f) compliance with any European Union obligation.

Fees for entry into a nature conservation area.

1991-11

Nature Protection

24A.(1) The fees payable to Government for entry into a nature conservation area shall be those set out in paragraph 1(1) of Schedule 10.

(2) With the exception of the fee for persons entering by foot at Jew's Gate or Willis's Road the payment by a person of the relevant fee set out in paragraph 1(1) of Schedule 10 exempts such person from the requirement to pay a further fee under section 24B for entry into the tourist sites within a nature conservation area.

Fees for entry into tourist sites within a nature conservation area.

24B. The fees payable to Government for entry into tourist sites within a nature conservation area shall be those set out in paragraph 1(2) of Schedule 10.

Fees (Miscellaneous).

24C.(1) The Minister may exempt particular persons, vehicles, categories of persons or categories of vehicles from payment of the fees set out in Schedule 10 to the extent set out in such exemption.

(2) Fees recovered in accordance with sections 24A and 24B shall constitute revenue of and be paid into the Consolidated Fund.

Terms and conditions of entry.

24D. The Minister may by Order published in the Gazette—

- (a) set the terms and conditions of entry into a nature conservation area (including times and dates);
- (b) define which sites in a nature conservation area are "tourist sites" for the purposes of this Act.

Offences.

24E.(1) A person who—

- (a) conveys another person in a public service vehicle into a nature conservation area; or
- (b) assists another person to enter a nature conservation area;

other than on the payment of the relevant fee is guilty of an offence and liable on summary conviction to a fine at level 3 on the standard scale and in the case of a second or subsequent conviction at level 4 on the standard scale.

(2) A third conviction for an offence against sub-section (1) shall render the offender ineligible to hold a road service licence, a licence to drive a public service vehicle or a licence to act as a conductor of a public service vehicle for a period of 12 months and the Transport Commission shall immediately revoke any such licence (including any road service licence) which the offender may hold.

- (3) A person who—
- (a) contravenes; or
 - (b) assists another in contravening;

a term or condition of entry included in an Order made under section 24D is guilty of an offence and liable on summary conviction to a fine at level 3 on the standard scale.

- (4) A person who—
- (a) enters a tourist site within a nature conservation area; or
 - (b) assists another to enter a tourist site within a nature conservation area;

other than on the payment of the relevant fee is guilty of an offence and liable on summary conviction to a fine at level 3 on the standard scale.

Exclusion Orders.

24F.(1)The Minister for Transport may issue an Order excluding a holder of a public service vehicle licence from entering into a nature conservation area in the course of his business as a driver of a public service vehicle for such a period of time as shall be set out in the Order up to 3 months.

(2) The Minister for Transport may only issue such an Order if he is satisfied that there is reasonable cause to believe that the person has conveyed a person or persons into a nature conservation area without the payment of the relevant fee.

(3) A copy of an Order made under this section shall be served on the person against whom it is directed.

(4) A person aggrieved by an Order made under this section may appeal to the Supreme Court on a point of law; the Order shall remain in force until such time as the appeal is determined and a decision has been made by the Minister for Transport under subsection (6) or the period of time set out in the Order expires (whichever is the sooner).

- (5) In determining an appeal under subsection (4)—

1991-11

Nature Protection

- (a) where the court is of the opinion that the relevant decision is wrong in law the Court—
 - (i) shall make a declaration to that effect;
 - (ii) shall inform the appellant and the Minister for Transport of such declaration; and
 - (iii) may, where it considers it appropriate to do so, request that the Minister for Transport reconsider the relevant decision.
 - (b) where the court is not of the opinion that the relevant decision is wrong in law the Court shall—
 - (i) confirm the Order of the Minister for Transport; and
 - (ii) inform the appellant and the Minister for Transport of such confirmation.
- (6) Where the Minister for Transport receives a request under subsection (5)(a)(iii) he shall reconsider the relevant decision de novo.
- (7) If without reasonable excuse a person does anything which he is prohibited from doing by an exclusion order, the person commits an offence and is liable on summary conviction, to a fine at level 5 on the standard scale.

25. Sections 8 and 9 of the Animals and Birds Act are repealed.

SCHEDULE 1.

Section 8

SPECIFIED WILD ANIMALS

NAME	COMMON NAME
MAMMALIA	MAMMALS
Insectivora	Insectivores
Erinaceidae	hedgehogs
Talpidae	moles
Soricidae	shrews
Chiroptera	Bats
all species	all species
Primates	Apes & monkeys
Macaca sulvanus	Barbary Macaque
Carnivora	Carnivores
Vulpes vulpes	Red Fox
Rodentia	Rodents
Eliomys quercinus	Garden dormouse
Lagomorpha	Rabbits & hares
Oryctolagus cuniculus	Rabbit
Pinnipedia	Seals
Monachus monachus	Monk Seal
Cetacea	Whales, porpoises and dolphins
all species	all species
AMPHIBIA	AMPHIBIANS
all species	all species
REPTILIA	REPTILES
all species	all species
PISCES	FISH
Hippocampus spp.	seahorses
Syngnathus spp.	pipefish
Thalassoma spp.	Turkish wrasse
Blennius spp.	blennies
Gobius spp.	gobies
Chromogobius spp.	gobies

1991-11

Nature Protection

Thorogobius spp.

gobies

INSECTA

Lepidoptera

Iphiclides podalinius
 Euchloe tagis
 Anthocaris belia
 Gonepteryx rhamni
 Danaus chryssipus
 Melanargria ines
 Pyronia cecilia
 Strymonidia spini
 Tomares ballus
 Zizeenia knysna
 Carcharodus alceae
 Spialia sertorius
 Gegenes nostradamus
 Borbo borbonica
 Zygaena fausta gibraltarica

Dictyoptera

all species

ARACHNIDA

Macrothele calpetana

CRUSTACEA

Lepas anatifera
 Maja spp.

CHILOPODA

Scholopendra cingulatus

MOLLUSCA

Bivalvia

Atrina pectinata
 Pinna nobilis
 PINNA RUDIS

Gastropoda

Haliotis tuberculata
 Patella ferruginea
 Monodonta spp.
 Jujubinus spp.
 Gibbula spp.
 Acicula norrisi
 Thais haemastoma
 Aplysia spp.

INSECTS

Butterflies and Moths

Scarce Swallowtail
 Portuguese Dappled White
 Morocco Orange Tip
 Brimstone
 Plain Tiger
 Spanish Marbled White
 Southern Gatekeeper
 Blue-spot Hairstreak
 Provence Hairstreak
 African Grass Blue
 Mallow Skipper
 Red Underwing Skipper
 Mediterranean Skipper
 Zeller's Skipper
 Gibraltar Burnet Moth

Mantids

all species

SPIDERS

Gibraltar Funnel-web Spider

CRUSTACEANS

Goose Barnacle
 spider crabs.

CENTIPEDES & MILLIPEDES

MOLLUSCS

Bivalves

Brittle Pen Shell
 Noble Pen Shell
 Rough Pen Shell

Gastropods

Sea Ormer
 Ribbed Mediterranean Limpet
 toothed topshells
 top shells
 top shells
 Rock Shell
 sea hares

Onchidella celtica	
Lauria cylindracea	Chrysalis Snails
Truncatellina cylindrica	Cylindrical Whorl Snail
Pyramidula rupestris	Rock Snail
Chondrina calpica	
Granopupa granum	
Ferussacia follicula	
Charonia spp.	tritons
Epitonium spp.	wentletraps
Trivia spp.	cowries
Cypraea spp.	cowries
Mitra zonata	Zoned Mitre Shell
Bolinus brandaris	Purple Dye Murex
Hexaplex trunculus	Banded Murex
Cecilioides spp.	
Testacella maugei	Mauge's slug
Vitrea contracta	Glass Snail
Oxychilus draparnaudi	
Oxychilus hudatinus	
Parmacella valencienii	
Milax nigricans	Black slug
Deroceras ponsonbyi	Ponsonby's slug
Trichia hispida	Hairy snail
Helicella apicina	
Helicella conspurcata	
Candidula intersecta	Wrinkled snail
Cernuella virgata	Striped snail
Cochlicella acuta	Pointed snail
Caracollina lenticula	
Osteophora calpeana	
Cumbium olla	
Cephalopoda	Cephalopods
Argonauta argo	Paper Nautilus
Eledone spp.	Lesser Octopus
ECHINOIDEA	SEA URCHINS
Echinus actutus	Common Sea Urchin
ANTHOZOA	ANEMONES, CORALS,
Madreporaria	
Balanophyllia regia	Regal Coral
Clodocora cespitosa	Carpet Coral
Dendrophyllia ramea	Yellow Coral
Lophelia pertusa	coral
Leptosammia pruroti	Yellow Cup Coral
Astroides calcycularis	Star Coral

1991-11

Nature Protection

Alcyonacea

Alcyonium palmatum

Deadman's fingers

Parerythropodium corralloides

soft coral

Gorgonacea

Eunicella cavolinii

Yellow Gorgonian

Eunicella clavata

Violet Sea Whip

Eunicella singularis

gorgonian

Eunicella verrucosa

White Gorgonian

Corallium rubrum

Red Coral

SCHEDULE 2

Section 11

Name	Common Name
	GYMONOGRAMMACEAE
Anogramma leptophylla	Annual Gymnogram
	ASPLENIACEAE
Ceterach officinarum	Rusty-back Fern
Asplenium trichomanes	Maidenhair Spleenwort
	POLYPODIACEAE
Polypodium australe	Southern Polypody
	EPHEDRACEAE
Ephedra fragilis	Joint Pine
	MORACEAE
Ficus carica	Fig
	URTICACEAE
Urtica dubia	Nettle
Parietaria diffusa	Pellitory-of-the-wall
Parietaria lusitancica	
	SANTALACEAE
Osyris quadripartita	
	ARISTOLOCHIACEAE
Aristolochia baetica	Pipe Vine
	POLYGONACEAE
Polygonum aviculare	Common Knotgrass
Rumex intermedius	
Emex spinosa	
	CHEONOPODIACEAE
Beta vulgaris	Beet
Chenopodium ambrosioides	
Chenopodium murale	Nettle-leaved Goosefoot
Chenopodium album	Fat Hen
	AMARANTHACEAE
Amaranthus blitoides	
Amaranthus lividus	
Achyranthes sicula	
	NYCTAGINACEAE

1991-11

Nature Protection

Mirabilis jalapa	Four-o'clock Plant
	AIZOACEAE
Carpobrotus edulis	Hottentot fig
	CARYOPHYLLACEAE
Arenaria leptoclados	Lesser Thyme-leaved Sandwort
Minuartia hybrida	Fine-leaved Sandwort
Stellaria media	Chickweed
Stellaria pallida	Lesser Chickweed
Cerastium glomeratum	Sticky Mouse-ear Chickweed
Sagina apetala	Common Pearlwort
Paronychia argentea	
Herniaria lusitanica	Ciliate Rupture-wort
Polycarpon tetraphyllum	Four-leaved All-seed
Spergularia marina	
Silene obtusifolia	
Silene colorata	Pink Mediterranean Catchfly
Silene nocturna	
	RANUNCULACEAE
Clematis cirrhosa	Virgin's Bower
Ranunculus bullatus	Bullate Buttercup
Ranunculus paludosus	Fan-leaved Buttercup
	PAPAVERACEAE
Papaver rhoeas	Corn Poppy
Glaucium flavum	Yellow Horned Poppy
Fumaria capreolata	Ramping Fumitory
Fumaria sepium	
	CRUCIFERAE
Sisymbrium officinale	Hedge Mustard
Cardamine hirsuta	Hairy Bittercress
Lobularia maritima	Sweet Alison
Biscutella laevigata	Buckler Mustard
Diplotaxis siifolia	
Hirschfeldia incana	Hoary Mustard
Cakile maritima	Sea Rocket
Raphanus raphanistrum	Wild Raddish
	RESEDACEAE
Reseda luteola	Dyers Rocket
Reseda alba	Upright Mignonette
	CRASSULACEAE
Umbilicus rupestris	Wall Pennywort
Umbilicus horizontalis	
Sedum sediforme	
Sedum album	White Stonecrop

Sedum rubens	
	ROSACEAE
Rubus ulmifolius	
Sanguisorba minor	Salad Burnet
	LEGUMINOSAE
Albizia lophantha	
Calicotome villosa	Thorny Broom
Teline linifolia	
Astragalus boeticus	
Psoralea bituminosa	Pitch Trefoil
Vicia tenuifolia	Slender-leaved Tufted Vetch
Vicia sativa	Common Vetch
Vicia lutea	Yellow Vetch
Lathyrus clymenum	
Pisum sativum	Pea
Ononis reclinata	Small Restharrow
Ononis viscosa	
Melilotus indica	Small-flowered Melilot
Medicago littoralis	
Medicago polymorpha	Hairy Medick
Trifolium glomeratum	Clustered Clover
Trifolium tomentosum	Woolly Trefoil
Trifolium campestre	Hop Trefoil
Trifolium scabrum	Rough Trefoil
Trifolium stellatum	Star Clover
Lotus corniculatus	Birdsfoot Trefoil
Lotus edulis	
Lotus ornithopodioides	
Lotus creticus	Southern Birdsfoot Trefoil
Coronilla valentina	Shrubby Scorpion Vetch
Hippocrepis multisiliquosa	
Scorpiurus muricatus	
	OXALIDACEAE
Oxalis pes-caprae	Bermuda Buttercup
	GERANIACEAE
Geranium rotundifolium	Round-leaved Cranesbill
Geranium molle	Dovesfoot Cranesbill
Geranium purpureum	Lesser Herb Robert
Erodium laciniatum	
Erodium malacoides	Soft Storksbill
Erodium moschatum	Musk Storksbill
	TROPAEOLACEAE
Tropaeolum majus	Nasturtium
	LINACEAE

1991-11

Nature Protection

Linum strictum	Upright Yellow Flax
	EUPHORBIACEAE
Mercurialis annua	Annual Mercury
Euphorbia squamigera	
Euphorbia terracina	
Euphorbia peplus	
Euphorbia medicaginea	
	RUTACEAE
Ruta angustifolia	Fringed Rue
	ANACARDIACEAE
Pistacia terebinthus	Terebinth; Turpentine Tree
Pistacia lentiscus	Lentisc
Schinus molle	Californian Pepper Tree
	RHAMNACEAE
Rhamnus alaternus	Mediterranean Buckthorn
	MALVACEAE
Malva hispanica	Common Mallow
Malva sylvestris	Smaller Tree Mallow
Lavatera cretica	
	CUCURBITACEAE
Ecballium elaterium	Squirting Cucumber
	CACTACEAE
Opuntia ficus-indica	Prickly Pear
Opuntia tuna	
	MYRTACEAE
Eucalyptus camaldulensis	Red Gum
Eucalyptus globulus	Blue Gum
	THELIGONACEAE
Theligonum cynocrambe	
	ARALIACEAE
Hedera helix	Ivy
	UMBELLIFERAE
Smyrniolus olusatrum	Alexanders
Crithmum maritimum	Rock Samphire
Foeniculum vulgare	Fennel
Kundmannia sicula	
Elaeoselinum foetidum	
Thapsia villosa	
Torilis arvensis	Spreading Hedge Parsley
Daucus carota	Wild Carrot

Anagallis arvensis	PRIMULACEAE Pimpernel
Jasminum fruticans Olea europaea	OLEACEAE Wild Jasmine Olive
Blackstonia perfoliata Centaurium erythraea	GENTIANACEAE Yellow Wort Common Centaury
Vinca difformis	APOCYNACEAE Intermediate Periwinkle
Sherardia arvensis Galium aparine Galium verrucosum Galium murale Valantia muralis Rubia peregrina	RUBIACEAE Field Madder Cleavers Wild Madder
Convolvulus arvensis Convolvulus althaeoides	CONVOLVULACEAE Field Bindweed Mallow-leaved Bindweed
Heliotropium europaeum Echium creticum Borago officinalis	BORAGINACEAE Heliotrope Borage
Lantana camara	VERBENACEAE
Teucrium fruticans Teucrium polium Prasium majus Phlomis purpurea Calamintha sylvatica Micromeria graeca Rosmarinus officinalis Lavandula dentata	LABIATAE Tree Germander Feltly Germander Purple Jerusalem Sage Rosemary Toothed Lavender
Solanum luteum luteum Solanum luteum alatum Solanum sodomaeum	SOLANACEAE False Sodom Apple

1991-11

Nature Protection

<i>Nicotiana glauca</i>	Shrub Tobacco
	SCROPHULARIACEAE
<i>Antirrhinum majus cirrhigerum</i>	Snapdragon
<i>Antirrhinum jaus tortuosum</i>	Snapdragon
<i>Misopates orontium</i>	Weasel's Snout
<i>Linaria amethystea</i>	
<i>Cymbalaria muralis</i>	Ivy-leaved Toadflax
<i>Veronica cymbalaria</i>	Pale Speedwell
<i>Veronica arvensis</i>	Wall Speed well
	ACANTHACEAE
<i>Acanthus mollis</i>	Bear's Breech
	OROBANCHACEAE
<i>Orobanche ramosa</i>	Branched Broomrape
<i>Orobanche minor</i>	Lesser Broomrape
<i>Orobanche crenata</i>	
<i>Orobanche sanguinea</i>	
	PLANTAGINACEAE
<i>Plantago coronopus</i>	Buckshorn Plantain
<i>Plantago lagopus</i>	Haresfoot Plantain
<i>Plantago afra</i>	Branched Plantain
	CAPRIFOLIACEAE
<i>Lonicera implexa</i>	Honeysuckle
	VALERIANACEAE
<i>Fedia cornucopiae</i>	
<i>Centranthus calcitrapae</i>	
<i>Centranthus ruber</i>	Red Valerian
	DIPSACACEAE
<i>Scabiosa atropurpurea</i>	Mournful Widow
	CAMPANULACEAE
<i>Campanula erinus</i>	Annual Bellflower
	COMPOSITAE
<i>Aster squamatus</i>	
<i>Conyza Albida</i>	
<i>Conyza Bonariensis</i>	
<i>Helichrysum rupestre</i>	
<i>Phagnalon saxatile</i>	
<i>Dittrichia viscosa</i>	Aromatic Inula
<i>Pallenis spinsosa</i>	
<i>Asteriscus maritimus</i>	Sea Aster
<i>Chrysanthemum coronarium</i>	Crown Daisy

<i>Senecio bicolor</i>	Silver Ragwort; Cineraria
<i>Senecio vulgaris</i>	Groundsel
<i>Calendula suffruticosa</i>	
<i>Calendula arvensis</i>	Marigold
<i>Carlina corymbosa</i>	Flat-topped Carline Thistle
<i>Carduus tenuiflorus</i>	
<i>Galactites tomentosa</i>	
<i>Centaurea sonchifolia</i>	
<i>Centaurea melitensis</i>	Maltese Star Thistle
<i>Centaurea pullata</i>	
<i>Carthamus arborescens</i>	
	CHICORIOIDEAE
<i>Scolymus hispanicus</i>	Spanish Oyster Plant
<i>Hyoseris radiata</i>	
<i>Hedypnois arenaria</i>	
<i>Urospermum picroides</i>	
<i>Reichardia picroides</i>	
<i>Reichardia intermedia</i>	
<i>Leontodon taraxacoides</i>	
<i>Aetheorhiza bulbosa</i>	
<i>Sonchus olearaceus</i>	Common Sow-thistle
<i>Sonchus tenerrimus</i>	
<i>Lactuca tenerrima</i>	
<i>Andryala integrifolia</i>	
	LILIACEAE
<i>Asphodelus albus</i>	White Asphodel
<i>Asphodelus ramosus</i>	Asphodel
<i>Aloe arborescens</i>	
<i>Colchicum lusitanum</i>	
<i>Urginea maritima</i>	Sea Squill
<i>Allium roseum</i>	Rose Garlic
<i>Allium triquetrum</i>	Tgriquetrous Garlic
<i>Allium ampeloprasum</i>	Wild leek
<i>Allium sphaerocephalon</i>	Round-headed leek
<i>Nothoscordum inodorum</i>	
<i>Asparagus albus</i>	Spiny asparagus
<i>Ruscus hypophyllum</i>	
<i>Smilax aspera</i>	Smilax
	AMARYLLIDACEAE
<i>Narcissus papyraceus</i>	Paper-white Narcissus
	DIOSCOREACEAE
<i>Tamus communis</i>	Black Bryony
	IRIDACEAE
<i>Iris germanica</i>	Fleur-de-lis
<i>Gynandriris sisyrinchium</i>	Barbary Nut

1991-11

Nature Protection

<i>Gladiolus communis</i>	Freesia
	GRAMINEAE
<i>Lolium multiflorum</i>	Italian Rye Grass
<i>Vulpia geniculata</i>	
<i>Vulpia ciliata</i>	
<i>Desmazeria rigida</i>	Hard Poa
<i>Desmazeria marina</i>	Stiff Sand-grass; Darnel Poa
<i>Poa annua</i>	Annual Meadow-grass
<i>Poa infirma</i>	
<i>Dactyllis glomerata</i>	Cocksfoot
<i>Melica minuta</i>	
<i>Bromus diandrus</i>	Great Brome
<i>Bromus madritensis</i>	Compact Brome
<i>Brachypodium disachion</i>	
<i>Trisetum paniceum</i>	
<i>Elymus farctus farctus x</i>	Hybrid Sea Couch
<i>Elymus repens</i>	
<i>Triticum aestivum</i>	Bread Wheat
<i>Hordeum murinum</i>	Wall Barley
<i>Avena barbata</i>	
<i>Avena sterilis</i>	Anumated Oat
<i>Lagurus ovatus</i>	Hare's Tail
<i>Piptatherum miliaceum</i>	
<i>Piptatherum coerulescens</i>	
<i>Stipa tenacissima</i>	
<i>Arundo donax</i>	Giant Reed; Cane
<i>Cynodon dactylon</i>	Bermuda Grass
<i>Panicum repens</i>	
<i>Hyparrhenia hirta</i>	
<i>Phalaris canariensis</i>	Canary Grass
<i>Digitaria sanguinalis</i>	Hairy Finger-grass
	ARACEAE
<i>Arisarum vulgare</i>	Friar's Cowl
	CYPERACEAE
<i>Cyperus rotundus</i>	

SCHEDULE 3.

Wild Birds, Wild Animals and wild Plants in respect of which no licence shall be issued under section 13 which may result in the extinction in Gibraltar of that wild bird, wild animal or wild plant.

Name	Common Name
<i>Phalacrocorax aristotelis desmarestii</i>	Western Mediterranean Shag

Falconiformes	Any bird of prey
Alectoris barbara	Barbary Partridge
Tytonidae and Strigidae	any owl
Vulpes vulpes	Red Fox
Macaca sylvanus	Barbary Macaque
Acicula norris	(Gibraltar endemic snail)
Osteophora calpeana	(Gibraltar endemic snail)
Cecilioides spp.	(Gibraltar endemic snail)
Macrothele calpetana	Gibraltar Funnel-web Spider
Cerastium gibraltarium	Gibraltar Chickweed
Silene tomentosa	Gibraltar Sea Campion
Iberis gibraltaria	Gibraltar Candytuft
Saxifraga globulifera	Gibraltar Saxifrage
Ononis natrix	Gibraltar Restharrow
Limonium emarginatum	Gibraltar Sea Lavender
Thymus wildenowii	Gibraltar Thyme
Petroselinum crispum	Parsley
Ferula tingitana	Giant Tangier Fennel
Succowia balearica	

SCHEDULE 4

Section 17M

**PROCEDURE IN CONNECTION WITH ORDERS UNDER
SECTION 17M****Coming into operation.**

1. An order takes effect on its being made.

Publicity for orders.

2.(1) The Government shall, as soon as practicable after making an order, publish in the Gazette a notice setting out the order (or describing its general effect) and stating that it has taken effect.

(2) The notice shall —

- (a) name a place in the area in which the land to which the order relates is situated where a copy of the order may be inspected free of charge at all reasonable hours; and
- (b) specify the time (not being less than 14 days from the date of the first publication of the notice) within which, and the manner in which, representations or objections with respect to the order may be made.

(3) A copy of the notice shall be served on —

- (a) every owner and occupier of that land (subject to paragraph 4);
- (b) the Development and Planning Commission; and
- (c) the Nature Conservancy Council.

Procedures when orders opposed.

3. (1) If any representation or objection is duly made within the period specified in accordance with paragraph 2(2)(b) with respect to an order and is not withdrawn, then, as soon as practicable the Minister shall either —

- (a) cause an inquiry to be held; or

- (b) afford any person by whom a representation or objection has been duly made and not withdrawn an opportunity of being heard by a person appointed by the Minister for the purpose.

(2) On considering any representations or objections duly made and the report of any person appointed to hold the inquiry or to hear representations or objections, the Government shall decide either to take no action on the order, or to make an order amending or revoking it as it thinks appropriate in the light of the report, representations or objections.

(3) An amending or revoking order made by virtue of sub-paragraph (2) takes effect immediately and no representation or objection with respect to it shall be entertained.

Restriction on power to amend orders or confirm them with modifications.

4. The Government shall not by virtue of paragraph 3(2) amend an order which has taken effect so as to extend the area to which the order applies.

Notice of final decision on order.

5. (1) The Minister shall as soon as practicable after making an order by virtue of paragraph 3(2) give notice —

- (a) setting out the order (or describing its effect) and stating that it has taken effect; and
- (b) naming a place in the area in which the land to which the order relates is situated where a copy of the order may be inspected free of charge at all reasonable hours.

(2) The Minister shall give notice as soon as practicable of a decision under paragraph 3(2) to take no action on an order which has already taken effect.

Proceedings for questioning validity of orders.

6. (1) In this paragraph the “relevant date” is, in the case of an order —

- (a) in respect of which no representations have been made under paragraph 3, 15 days from the publication of the notice under paragraph 2(1); and
- (b) in respect of which representations have been made, the date on which the Minister gives notice under paragraph 5.

1991-11

Nature Protection

(2) If any person is aggrieved by an order to which this paragraph applies and desires to question its validity on the grounds that it is not within the powers of section 17M or that any of the requirements of this Schedule have not been complied with in relation to it, he may within six weeks from the date of the relevant date made an application to the Supreme Court under this paragraph.

(3) On any such application the court may, if satisfied that the order is not within those powers or that the interests of the applicant have been substantially prejudiced by a failure to comply with any of those requirements, quash the order, or any provision of the order, either generally or in so far as it affects the interests of the applicant.

(4) Except as provided by this paragraph, the validity of an order shall not be questioned in any legal proceedings whatsoever.

Interpretation.

7. In this Schedule —

“amending order” and “revoking order” mean an order which amends or, as the case may be, revokes a previous order;

“order” means an order under section 17M.

SCHEDULE 5

Section 2

**COUNCIL DIRECTIVE 92/43/EEC
of 21 May 1992****on the conservation of natural habitats and of wild fauna and flora**

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130s thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the European Parliament⁽²⁾,

Having regard to the opinion of the Economic and Social Committee⁽³⁾,

Whereas the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora, are an essential objective of general interest pursued by the Community, as stated in Article 130r of the Treaty;

Whereas the European Community policy and action programme on the environment (1987 to 1992)⁽⁴⁾ makes provision for measures regarding the conservation of nature and natural resources;

Whereas, the main aim of this Directive being to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, this Directive makes a contribution to the general objective of sustainable development; whereas the maintenance of such biodiversity may in certain cases require the maintenance, or indeed the encouragement, of human activities;

Whereas, in the European territory of the Member States, natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened; whereas given that the threatened habitats and species form part of the Community's natural heritage and the threats to them are often of a transboundary nature, it is necessary to take measures at Community level in order to conserve them;

⁽¹⁾ OJ No C 247, 21. 9. 1988, p. 3 and OJ No C 195, 3. 8. 1990, p. 1.

⁽²⁾ OJ No C 75, 20. 3. 1991, p. 12.

⁽³⁾ OJ No C 31, 6. 2. 1991, p. 25.

⁽⁴⁾ OJ No C 328, 7. 12. 1987, p. 1.

1991-11

Nature Protection

Whereas, in view of the threats to certain types of natural habitat and certain species, it is necessary to define them as having priority in order to favour the early implementation of measures to conserve them;

Whereas, in order to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status, it is necessary to designate special areas of conservation in order to create a coherent European ecological network according to a specified timetable;

Whereas all the areas designated, including those classified now or in the future as special protection areas pursuant to Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds⁽⁵⁾, will have to be incorporated into the coherent European ecological network;

Whereas it is appropriate, in each area designated, to implement the necessary measures having regard to the conservation objectives pursued;

Whereas sites eligible for designation as special areas of conservation are proposed by the Member States but whereas a procedure must nevertheless be laid down to allow the designation in exceptional cases of a site which has not been proposed by a Member State but which the Community considers essential for either the maintenance or the survival of a priority natural habitat type or a priority species;

Whereas an appropriate assessment must be made of any plan or programme likely to have a significant effect on the conservation objectives of a site which has been designated or is designated in future;

Whereas it is recognized that the adoption of measures intended to promote the conservation of priority natural habitats and priority species of Community interest is a common responsibility of all Member States; whereas this may, however, impose an excessive financial burden on certain Member States given, on the one hand, the uneven distribution of such habitats and species throughout the Community and, on the other hand, the fact that the 'polluter pays' principle can have only limited application in the special case of nature conservation;

Whereas it is therefore agreed that, in this exceptional case, a contribution by means of Community co-financing should be provided for within the limits of the resources made available under the Community's decisions;

Whereas land-use planning and development policies should encourage the management of features of the landscape which are of major importance for wild fauna and flora;

⁽⁵⁾ OJ No L 103, 25. 4. 1979, p. 1. Directive as last amended by Directive 91/244/ECC (OJ No L 115, 8. 5. 1991, p. 41).

Whereas a system should be set up for surveillance of the conservation status of the natural habitats and species covered by this Directive;

Whereas a general system of protection is required for certain species of flora and fauna to complement Directive 79/409/EEC; whereas provision should be made for management measures for certain species, if their conservation status so warrants, including the prohibition of certain means of capture or killing, whilst providing for the possibility of derogations on certain conditions;

Whereas, with the aim of ensuring that the implementation of this Directive is monitored, the Commission will periodically prepare a composite report based, *inter alia*, on the information sent to it by the Member States regarding the application of national provisions adopted under this Directive;

Whereas the improvement of scientific and technical knowledge is essential for the implementation of this Directive; whereas it is consequently appropriate to encourage the necessary research and scientific work;

Whereas technical and scientific progress mean that it must be possible to adapt the Annexes; whereas a procedure should be established whereby the Council can amend the Annexes;

Whereas a regulatory committee should be set up to assist the Commission in the implementation of this Directive and in particular when decisions on Community co-financing are taken;

Whereas provision should be made for supplementary measures governing the reintroduction of certain native species of fauna and flora and the possible introduction of non-native species;

Whereas education and general information relating to the objectives of this Directive are essential for ensuring its effective implementation,

HAS ADOPTED THIS DIRECTIVE:

Definitions

Article 1

For the purpose of this Directive:

(a) *conservation* means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status as defined in (e) and (i);

(b) *natural habitats* means terrestrial or aquatic areas distinguished by geographic, abiotic and biotic features, whether entirely natural or semi-natural;

Nature Protection

(c) *natural habitat types of Community interest* means those which, within the territory referred to in Article 2:

- (i) are in danger of disappearance in their natural range; or
- (ii) have a small natural range following their regression or by reason of their intrinsically restricted area; or
- (iii) present outstanding examples of typical characteristics of one or more of the nine following biogeographical regions: Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesian, Mediterranean, Pannonian and Steppic.

Such habitat types are listed or may be listed in Annex I;

(d) *priority natural habitat types* means natural habitat types in danger of disappearance, which are present on the territory referred to in Article 2 and for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory referred to in Article 2; these priority natural habitat types are indicated by an asterisk (*) in Annex I;

(e) *conservation status of a natural habitat* means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservation status of a natural habitat will be taken as ‘favourable’ when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined in (i);

(f) *habitat of a species* means an environment defined by specific abiotic and biotic factors, in which the species lives at any stage of its biological cycle;

(g) *species of Community interest* means species which, within the territory referred to in Article 2, are:

- (i) endangered, except those species whose natural range is marginal in that territory and which are not endangered or vulnerable in the western palearctic region; or
- (ii) vulnerable, i.e. believed likely to move into the endangered category in the near future if the causal factors continue operating; or
- (iii) rare, i.e. with small populations that are not at present endangered or vulnerable, but are at risk. The species are located within restricted geographical areas or are thinly scattered over a more extensive range; or
- (iv) endemic and requiring particular attention by reason of the specific nature of their habitat and/or the potential impact of their exploitation on their habitat and/or the potential impact of their exploitation on their conservation status.

Such species are listed or may be listed in Annex II and/or Annex IV or V;

(h) *priority species* means species referred to in (g) (i) for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory referred to in Article 2; these priority species are indicated by an asterisk (*) in Annex II;

(i) *conservation status of a species* means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;

The *conservation status* will be taken as 'favourable' when:

— population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and

— the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and

— there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis;

(j) *site* means a geographically defined area whose extent is clearly delineated;

(k) *site of Community importance* means a site which, in the biogeographical region or regions to which it belongs, contributes significantly to the maintenance or restoration at a favourable conservation

Nature Protection

status of a natural habitat type in Annex I or of a species in Annex II and may also contribute significantly to the coherence of Natura 2000 referred to in Article 3, and/or contributes significantly to the maintenance of biological diversity within the biogeographic region or regions concerned.

For animal species ranging over wide areas, sites of Community importance shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction;

(l) *special area of conservation* means a site of Community importance designated by the Member States through a statutory, administrative and/or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated;

(m) *specimen* means any animal or plant, whether alive or dead, of the species listed in Annex IV and Annex V, any part or derivative thereof, as well as any other goods which appear, from an accompanying document, the packaging or a mark or label, or from any other circumstances, to be parts or derivatives of animals or plants of those species;

(n) *the committee* means the committee set up pursuant to Article 20.

Article 2

1. The aim of this Directive shall be to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies.
2. Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest.
3. Measures taken pursuant to this Directive shall take account of economic, social and cultural requirements and regional and local characteristics.

Conservation of natural habitats and habitats of species

Article 3

1. A coherent European ecological network of special areas of conservation shall be set up under the title Natura 2000. This network, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species'

habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range.

The Natura 2000 network shall include the special protection areas classified by the Member States pursuant to Directive 79/409/EEC.

2. Each Member State shall contribute to the creation of Natura 2000 in proportion to the representation within its territory of the natural habitat types and the habitats of species referred to in paragraph 1. To that effect each Member State shall designate, in accordance with Article 4, sites as special areas of conservation taking account of the objectives set out in paragraph 1.

3. Where they consider it necessary, Member States shall endeavour to improve the ecological coherence of Natura 2000 by maintaining, and where appropriate developing, features of the landscape which are of major importance for wild fauna and flora, as referred to in Article 10.

Article 4

1. On the basis of the criteria set out in Annex III (Stage 1) and relevant scientific information, each Member State shall propose a list of sites indicating which natural habitat types in Annex I and which species in Annex II that are native to its territory the sites host. For animal species ranging over wide areas these sites shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction. For aquatic species which range over wide areas, such sites will be proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction. Where appropriate, Member States shall propose adaptation of the list in the light of the results of the surveillance referred to in Article 11.

The list shall be transmitted to the Commission, within three years of the notification of this Directive, together with information on each site. That information shall include a map of the site, its name, location, extent and the data resulting from application of the criteria specified in Annex III (Stage 1) provided in a format established by the Commission in accordance with the procedure laid down in Article 21.

2. On the basis of the criteria set out in Annex III (Stage 2) and in the framework both of each of the nine biogeographical regions referred to in Article 1 (c) (iii) and of the whole of the territory referred to in Article 2 (1), the Commission shall establish, in agreement with each Member State, a draft list of sites of Community importance drawn from the Member States' lists identifying those which host one or more priority natural habitat types or priority species.

Nature Protection

Member States whose sites hosting one or more priority natural habitat types and priority species represent more than 5 % of their national territory may, in agreement with the Commission, request that the criteria listed in Annex III (Stage 2) be applied more flexibly in selecting all the sites of Community importance in their territory.

The list of sites selected as sites of Community importance, identifying those which host one or more priority natural habitat types or priority species, shall be adopted by the Commission in accordance with the procedure laid down in Article 21.

3. The list referred to in paragraph 2 shall be established within six years of the notification of this Directive.

4. Once a site of Community importance has been adopted in accordance with the procedure laid down in paragraph 2, the Member State concerned shall designate that site as a special area of conservation as soon as possible and within six years at most, establishing priorities in the light of the importance of the sites for the maintenance or restoration, at a favourable conservation status, of a natural habitat type in Annex I or a species in Annex II and for the coherence of Natura 2000, and in the light of the threats of degradation or destruction to which those sites are exposed.

5. As soon as a site is placed on the list referred to in the third subparagraph of paragraph 2 it shall be subject to Article 6 (2), (3) and (4).

Article 5

1. In exceptional cases where the Commission finds that a national list as referred to in Article 4 (1) fails to mention a site hosting a priority natural habitat type or priority species which, on the basis of relevant and reliable scientific information, it considers to be essential for the maintenance of that priority natural habitat type or for the survival of that priority species, a bilateral consultation procedure shall be initiated between that Member State and the Commission for the purpose of comparing the scientific data used by each.

2. If, on expiry of a consultation period not exceeding six months, the dispute remains unresolved, the Commission shall forward to the Council a proposal relating to the selection of the site as a site of Community importance.

3. The Council, acting unanimously, shall take a decision within three months of the date of referral.

4. During the consultation period and pending a Council decision, the site concerned shall be subject to Article 6 (2).

Article 6

1. For special areas of conservation, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites.
2. Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.
3. Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.
4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

Article 7

Obligations arising under Article 6 (2), (3) and (4) of this Directive shall replace any obligations arising under the first sentence of Article 4 (4) of Directive 79/409/EEC in respect of areas classified pursuant to Article 4 (1) or similarly recognized under Article 4 (2) thereof, as from the date of implementation of this Directive or the date of classification or recognition by a Member State under Directive 79/409/EEC, where the latter date is later.

Nature Protection

Article 8

1. In parallel with their proposals for sites eligible for designation as special areas of conservation, hosting priority natural habitat types and/ or priority species, the Member States shall send, as appropriate, to the Commission their estimates relating to the Community co-financing which they consider necessary to allow them to meet their obligations pursuant to Article 6 (1).

2. In agreement with each of the Member States concerned, the Commission shall identify, for sites of Community importance for which co-financing is sought, those measures essential for the maintenance or re-establishment at a favourable conservation status of the priority natural habitat types and priority species on the sites concerned, as well as the total costs arising from those measures.

3. The Commission, in agreement with the Member States concerned, shall assess the financing, including co-financing, required for the operation of the measures referred to in paragraph 2, taking into account, amongst other things, the concentration on the Member State's territory of priority natural habitat types and/or priority species and the relative burdens which the required measures entail.

4. According to the assessment referred to in paragraphs 2 and 3, the Commission shall adopt, having regard to the available sources of funding under the relevant Community instruments and according to the procedure set out in Article 21, a prioritized action framework of measures involving co-financing to be taken when the site has been designated under Article 4 (4).

5. The measures which have not been retained in the action framework for lack of sufficient resources, as well as those included in the abovementioned action framework which have not received the necessary co-financing or have only been partially co-financed, shall be reconsidered in accordance with the procedure set out in Article 21, in the context of the two-yearly review of the action framework and may, in the meantime, be postponed by the Member States pending such review. This review shall take into account, as appropriate, the new situation of the site concerned.

6. In areas where the measures dependent on co-financing are postponed, Member States shall refrain from any new measures likely to result in deterioration of those areas.

Article 9

The Commission, acting in accordance with the procedure laid down in Article 21, shall periodically review the contribution of Natura 2000 towards achievement of the objectives set out in Article 2 and 3. In this context, a special area of conservation may be considered for

declassification where this is warranted by natural developments noted as a result of the surveillance provided for in Article 11.

Article 10

Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora.

Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

Article 11

Member States shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 2 with particular regard to priority natural habitat types and priority species.

Protection of species

Article 12

1. Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range, prohibiting:

- (a) all forms of deliberate capture or killing of specimens of these species in the wild;
- (b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;
- (c) deliberate destruction or taking of eggs from the wild;
- (d) deterioration or destruction of breeding sites or resting places.

2. For these species, Member States shall prohibit the keeping, transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild, except for those taken legally before this Directive is implemented.

3. The prohibition referred to in paragraph 1 (a) and (b) and paragraph 2 shall apply to all stages of life of the animals to which this Article applies.

1991-11

Nature Protection

4. Member States shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV (a). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.

Article 13

1. Member States shall take the requisite measures to establish a system of strict protection for the plant species listed in Annex IV (b), prohibiting:

(a) the deliberate picking, collecting, cutting, uprooting or destruction of such plants in their natural range in the wild;

(b) the keeping, transport and sale or exchange and offering for sale or exchange of specimens of such species taken in the wild, except for those taken legally before this Directive is implemented.

2. The prohibitions referred to in paragraph 1 (a) and (b) shall apply to all stages of the biological cycle of the plants to which this Article applies.

Article 14

1. If, in the light of the surveillance provided for in Article 11, Member States deem it necessary, they shall take measures to ensure that the taking in the wild of specimens of species of wild fauna and flora listed in Annex V as well as their exploitation is compatible with their being maintained at a favourable conservation status.

2. Where such measures are deemed necessary, they shall include continuation of the surveillance provided for in Article 11. Such measures may also include in particular:

— regulations regarding access to certain property,

— temporary or local prohibition of the taking of specimens in the wild and exploitation of certain populations,

— regulation of the periods and/or methods of taking specimens,

— application, when specimens are taken, of hunting and fishing rules which take account of the conservation of such populations,

— establishment of a system of licences for taking specimens or of quotas,

— regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens,

— breeding in captivity of animal species as well as artificial propagation of plant species, under strictly controlled conditions, with a view to reducing the taking of specimens of the wild,

— assessment of the effect of the measures adopted.

Article 15

In respect of the capture or killing of species of wild fauna listed in Annex V (a) and in cases where, in accordance with Article 16, derogations are applied to the taking, capture or killing of species listed in Annex IV (a), Member States shall prohibit the use of all indiscriminate means capable of causing local disappearance of, or serious disturbance to, populations of such species, and in particular:

- (a) use of the means of capture and killing listed in Annex VI (a);
- (b) any form of capture and killing from the modes of transport referred to in Annex VI (b).

Article 16

1. Provided that there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range, Member States may derogate from the provisions of Articles 12, 13, 14 and 15 (a) and (b):

- (a) in the interest of protecting wild fauna and flora and conserving natural habitats;
- (b) to prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property;
- (c) in the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- (d) for the purpose of research and education, of repopulating and reintroducing these species and for the breedings operations necessary for these purposes, including the artificial propagation of plants;
- (e) to allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species listed in Annex IV in limited numbers specified by the competent national authorities.

Nature Protection

2. Member States shall forward to the Commission every two years a report in accordance with the format established by the Committee on the derogations applied under paragraph 1. The Commission shall give its opinion on these derogations within a maximum time limit of 12 months following receipt of the report and shall give an account to the Committee.

3. The reports shall specify:

(a) the species which are subject to the derogations and the reason for the derogation, including the nature of the risk, with, if appropriate, a reference to alternatives rejected and scientific data used;

(b) the means, devices or methods authorized for the capture or killing of animal species and the reasons for their use;

(c) the circumstances of when and where such derogations are granted;

(d) the authority empowered to declare and check that the required conditions obtain and to decide what means, devices or methods may be used, within what limits and by what agencies, and which persons are to carry out the task;

(e) the supervisory measures used and the results obtained.

Information

Article 17

1. Every six years from the date of expiry of the period laid down in Article 23, Member States shall draw up a report on the implementation of the measures taken under this Directive. This report shall include in particular information concerning the conservation measures referred to in Article 6 (1) as well as evaluation of the impact of those measures on the conservation status of the natural habitat types of Annex I and the species in Annex II and the main results of the surveillance referred to in Article 11. The report, in accordance with the format established by the committee, shall be forwarded to the Commission and made accessible to the public.

2. The Commission shall prepare a composite report based on the reports referred to in paragraph 1. This report shall include an appropriate evaluation of the progress achieved and, in particular, of the contribution of Natura 2000 to the achievement of the objectives set out in Article 3. A draft of the part of the report covering the information supplied by a Member State shall be forwarded to the Member State in question for verification. After submission to the committee, the final version of the report shall be published by the Commission, not later than two years after receipt of the reports referred to in paragraph 1, and shall be forwarded to

the Member States, the European Parliament, the Council and the Economic and Social Committee.

3. Member States may mark areas designated under this Directive by means of Community notices designed for that purpose by the committee.

Research

Article 18

1. Member States and the Commission shall encourage the necessary research and scientific work having regard to the objectives set out in Article 2 and the obligation referred to in Article 11. They shall exchange information for the purposes of proper coordination of research carried out at Member State and at Community level.

2. Particular attention shall be paid to scientific work necessary for the implementation of Articles 4 and 10, and transboundary cooperative research between Member States shall be encouraged.

Procedure for amending the Annexes

Article 19

Such amendments as are necessary for adapting Annexes I, II, III, V and VI to technical and scientific progress shall be adopted by the Council acting by qualified majority on a proposal from the Commission.

Such amendments as are necessary for adapting Annex IV to technical and scientific progress shall be adopted by the Council acting unanimously on a proposal from the Commission.

Committee

Article 20

The Commission shall be assisted by a committee.

Article 21

1. Where reference is made to this Article, Articles 5 and 7 of Decision 1999/468/EC⁽¹⁾ shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

⁽¹⁾ Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission (OJ L 184, 17.7.1999, p. 23).

Nature Protection

2. The Committee shall adopt its rules of procedure.

Supplementary provisions

Article 22

In implementing the provisions of this Directive, Member States shall:

(a) study the desirability of re-introducing species in Annex IV that are native to their territory where this might contribute to their conservation, provided that an investigation, also taking into account experience in other Member States or elsewhere, has established that such re-introduction contributes effectively to re-establishing these species at a favourable conservation status and that it takes place only after proper consultation of the public concerned;

(b) ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction. The results of the assessment undertaken shall be forwarded to the committee for information;

(c) promote education and general information on the need to protect species of wild fauna and flora and to conserve their habitats and natural habitats.

Final provisions

Article 23

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive within two years of its notification. They shall forthwith inform the Commission thereof.

2. When Member States adopt such measures, they shall contain a reference to this Directive or be accompanied by such reference on the occasion of their official publication. The methods of making such a reference shall be laid down by the Member States.

3. Member States shall communicate to the Commission the main provisions of national law which they adopt in the field covered by this Directive.

Article 24

This Directive is addressed to the Member States.

ANNEX I

**NATURAL HABITAT TYPES OF COMMUNITY INTEREST
WHOSE CONSERVATION REQUIRES THE DESIGNATION OF
SPECIAL AREAS OF CONSERVATION**

Interpretation

Guidance on the interpretation of habitat types is given in the “Interpretation Manual of European Union Habitats” as approved by the committee set up under Article 20 (“Habitats Committee”) and published by the European Commission^(*).

The code corresponds to the NATURA 2000 code.

The sign “*” indicates priority habitat types.

1. COASTAL AND HALOPHYTIC HABITATS

11. Open sea and tidal areas

- 1110 Sandbanks which are slightly covered by sea water all the time
- 1120 * *Posidonia* beds (*Posidonium oceanicae*)
- 1130 Estuaries
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1150 * Coastal lagoons
- 1160 Large shallow inlets and bays
- 1170 Reefs
- 1180 Submarine structures made by leaking gases

12. Sea cliffs and shingle or stony beaches

- 1210 Annual vegetation of drift lines
- 1220 Perennial vegetation of stony banks
- 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts
- 1240 Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.
- 1250 Vegetated sea cliffs with endemic flora of the Macaronesian coasts

13. Atlantic and continental salt marshes and salt meadows

- 1310 *Salicornia* and other annuals colonizing mud and sand
- 1320 *Spartina* swards (*Spartinion maritimae*)
- 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

^(*)“Interpretation Manual of European Union Habitats”, version EUR 15/2” adopted by the Habitats Committee on 4 October 1999 and “Amendments to the “Interpretation Manual of European Union Habitats” with a view to EU enlargement” (Hab. 01/11b-rev. 1) adopted by the Habitats Committee on 24 April 2002 after written consultation, European Commission, Directorate General for Environment.

1340 * Inland salt meadows

14. Mediterranean and thermo-Atlantic salt marshes and salt meadows

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

1420 Mediterranean and thermo-Atlantic halophilous scrubs
(*Sarcocornetea fruticosi*)

1430 Halo-nitrophilous scrubs (*Pegano-Salsoletea*)

15. Salt and gypsum inland steppes

1510 * Mediterranean salt steppes (*Limonietalia*)

1520 * Iberian gypsum vegetation (*Gypsophiletalia*)

1530 * Pannonic salt steppes and salt marshes

16. Boreal Baltic archipelago, coastal and landupheaval areas

1610 Baltic esker islands with sandy, rocky and shingle beach vegetation
and sublittoral vegetation

1620 Boreal Baltic islets and small islands

1630 * Boreal Baltic coastal meadows

1640 Boreal Baltic sandy beaches with perennial vegetation

1650 Boreal Baltic narrow inlets

2. COASTAL SAND DUNES AND INLAND DUNES

21. Sea dunes of the Atlantic, North Sea and Baltic coasts

2110 Embryonic shifting dunes

2120 Shifting dunes along the shoreline with *Ammophila arenaria* (“white
dunes”)

2130 * Fixed coastal dunes with herbaceous vegetation (“grey dunes”)

2140 * Decalcified fixed dunes with *Empetrum nigrum*

2150 * Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)

2160 Dunes with *Hippophaë rhamnoides*

2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)

2180 Wooded dunes of the Atlantic, Continental and Boreal region

2190 Humid dune slacks

21A0 Machairs (* in Ireland)

22. Sea dunes of the Mediterranean coast

2210 Crucianellion maritimae fixed beach dunes

2220 Dunes with *Euphorbia terracina*

2230 Malcolmietalia dune grasslands

2240 Brachypodietalia dune grasslands with annuals

2250 * Coastal dunes with *Juniperus* spp.

2260 Cisto-Lavenduletalia dune sclerophyllous scrubs

2270 * Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*

23. Inland dunes, old and decalcified

2310 Dry sand heaths with *Calluna* and *Genista*

2320 Dry sand heaths with *Calluna* and *Empetrum nigrum*

2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands

2340 * Pannonic inland dunes

3. FRESHWATER HABITATS

31. Standing water

3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)

3120 Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoetes* spp.

3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*

3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.

3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* — type vegetation

3160 Natural dystrophic lakes and ponds

3170 * Mediterranean temporary ponds

3180 * Turloughs

3190 Lakes of gypsum karst

31A0 * Transylvanian hot-spring lotus beds

32. Running water—sections of water courses with natural or semi-natural dynamics (minor, average and major beds) where the water quality shows no significant deterioration

3210 Fennoscandian natural rivers

3220 Alpine rivers and the herbaceous vegetation along their banks

3230 Alpine rivers and their ligneous vegetation with *Myricaria germanica*

3240 Alpine rivers and their ligneous vegetation with *Salix elaeagnos*

3250 Constantly flowing Mediterranean rivers with *Glaucium flavum*

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

3270 Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. vegetation

3280 Constantly flowing Mediterranean rivers with *Paspalo-Agrostidion* species and hanging curtains of *Salix* and *Populus alba*

3290 Intermittently flowing Mediterranean rivers of the *Paspalo-Agrostidion*

32A0 Tufa cascades of karstic rivers in the Dinaric Alps

Nature Protection

4. TEMPERATE HEATH AND SCRUB

- 4010 Northern Atlantic wet heaths with *Erica tetralix*
- 4020 * Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*
- 4030 European dry heaths
- 4040 * Dry Atlantic coastal heaths with *Erica vagans*
- 4050 * Endemic macaronesian heaths
- 4060 Alpine and Boreal heaths
- 4070 * Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*)
- 4080 Sub-Arctic *Salix* spp. Scrub
- 4090 Endemic oro-Mediterranean heaths with gorse
- 40A0 * Subcontinental peri-Pannonic scrub
- 40B0 Rhodope *Potentilla fruticosa* thickets
- 40C0 * Ponto-Sarmatic deciduous thickets

5. SCLEROPHYLLOUS SCRUB (MATORRAL)

51. Sub-Mediterranean and temperate scrub

- 5110 Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (*Berberidion* p.p.)
- 5120 Mountain *Cytisus purgans* formations
- 5130 *Juniperus communis* formations on heaths or calcareous grasslands
- 5140 * *Cistus palhinhae* formations on maritime wet heaths

52. Mediterranean arborescent matorral

- 5210 Arborescent matorral with *Juniperus* spp.
- 5220 * Arborescent matorral with *Zyziphus*
- 5230 * Arborescent matorral with *Laurus nobilis*

53. Thermo-Mediterranean and pre-steppe brush

- 5310 *Laurus nobilis* thickets
- 5320 Low formations of *Euphorbia* close to cliffs
- 5330 Thermo-Mediterranean and pre-desert scrub

54. Phrygana

- 5410 West Mediterranean clifftop phrygas (*Astragalo-Plantaginetum subulatae*)
- 5420 *Sarcopoterium spinosum* phrygas
- 5430 Endemic phrygas of the *Euphorbio-Verbascion*

6. NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS

61. Natural grasslands

- 6110 * Rupicolous calcareous or basophilic grasslands of the *Alyso-Sedion albi*
- 6120 * Xeric sand calcareous grasslands
- 6130 Calaminarian grasslands of the *Violetalia calaminariae*
- 6140 Siliceous Pyrenean *Festuca eskia* grasslands
- 6150 Siliceous alpine and boreal grasslands
- 6160 Oro-Iberian *Festuca indigesta* grasslands
- 6170 Alpine and subalpine calcareous grasslands
- 6180 Macaronesian mesophile grasslands
- 6190 Rupicolous pannonic grasslands (*Stipo-Festucetalia pallentis*)

62. Semi-natural dry grasslands and scrubland facies

- 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)
- 6220 * Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*
- 6230 * Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
- 6240 * Sub-Pannonic steppic grasslands
- 6250 * Pannonic loess steppic grasslands
- 6260 * Pannonic sand steppes
- 6270 * Fennoscandian lowland species-rich dry to mesic grasslands
- 6280 * Nordic alvar and precambrian calcareous flatrocks
- 62A0 Eastern sub-Mediterranean dry grasslands (*Scorzoneratalia villosae*)
- 62B0 * Serpentinophilous grassland of Cyprus
- 62C0 * Ponto-Sarmatic steppes
- 62D0 Oro-Moesian acidophilous grasslands

63. Sclerophyllous grazed forests (dehesas)

- 6310 Dehesas with evergreen *Quercus* spp.

64. Semi-natural tall-herb humid meadows

- 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- 6420 Mediterranean tall humid grasslands of the *Molinio-Holoschoenion*
- 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- 6440 Alluvial meadows of river valleys of the *Cnidion dubii*
- 6450 Northern boreal alluvial meadows
- 6460 Peat grasslands of Troodos

65. Mesophile grasslands

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- 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
- 6520 Mountain hay meadows
- 6530 * Fennoscandian wooded meadows
- 6540 Sub-Mediterranean grasslands of the *Molinio-Hordeion secalini*

7. RAISED BOGS AND MIRES AND FENS

71. **Sphagnum acid bogs**

- 7110 * Active raised bogs
- 7120 Degraded raised bogs still capable of natural regeneration
- 7130 Blanket bogs (* if active bog)
- 7140 Transition mires and quaking bogs
- 7150 Depressions on peat substrates of the *Rhynchosporion*
- 7160 Fennoscandian mineral-rich springs and springfens

72. **Calcareous fens**

- 7210 * Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*
- 7220 * Petrifying springs with tufa formation (*Cratoneurion*)
- 7230 Alkaline fens
- 7240 * Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*

73. **Boreal mires**

- 7310 * Aapa mires
- 7320 * Palsa mires

8. ROCKY HABITATS AND CAVES

81. **Scree**

- 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)
- 8120 Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)
- 8130 Western Mediterranean and thermophilous scree
- 8140 Eastern Mediterranean screes
- 8150 Medio-European upland siliceous screes
- 8160 * Medio-European calcareous scree of hill and montane levels

82. **Rocky slopes with chasmophytic vegetation**

- 8210 Calcareous rocky slopes with chasmophytic vegetation
- 8220 Siliceous rocky slopes with chasmophytic vegetation

- 8230 Siliceous rock with pioneer vegetation of the *Sedo-Scleranthion* or of the *Sedo albi-Veronicion dillenii*
 8240 * Limestone pavements

83. Other rocky habitats

- 8310 Caves not open to the public
 8320 Fields of lava and natural excavations
 8330 Submerged or partially submerged sea caves
 8340 Permanent glaciers

9. FORESTS

(Sub)natural woodland vegetation comprising native species forming forests of tall trees, with typical undergrowth, and meeting the following criteria: rare or residual, and/or hosting species of Community interest

90. Forests of Boreal Europe

- 9010 * Western Taiga
 9020 * Fennoscandian hemiboreal natural old broad-leaved deciduous forests (*Quercus*, *Tilia*, *Acer*, *Fraxinus* or *Ulmus*) rich in epiphytes
 9030 * Natural forests of primary succession stages of landupheaval coast
 9040 Nordic subalpine/subarctic forests with *Betula pubescens* ssp. *czerepanovii*
 9050 Fennoscandian herb-rich forests with *Picea abies*
 9060 Coniferous forests on, or connected to, glaciofluvial eskers
 9070 Fennoscandian wooded pastures
 9080 * Fennoscandian deciduous swamp woods

91. Forests of Temperate Europe

- 9110 *Luzulo-Fagetum* beech forests
 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion roboripetraeae* or *Ilici-Fagenion*)
 9130 *Asperulo-Fagetum* beech forests
 9140 Medio-European subalpine beech woods with *Acer* and *Rumex arifolius*
 9150 Medio-European limestone beech forests of the *Cephalanthero-Fagion*
 9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*
 9170 *Galio-Carpinetum* oak-hornbeam forests
 9180 * *Tilio-Acerion* forests of slopes, screes and ravines
 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains
 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
 91B0 Thermophilous *Fraxinus angustifolia* woods
 91C0 * Caledonian forest
 91D0 * Bog woodland

1991-11

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- 91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
- 91F0 Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)
- 91G0 * Pannonic woods with *Quercus petraea* and *Carpinus betulus*
- 91H0 * Pannonian woods with *Quercus pubescens*
- 91I0 * Euro-Siberian steppic woods with *Quercus* spp.
- 91J0 * *Taxus baccata* woods of the British Isles
- 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*)
- 91L0 Illyrian oak-hornbeam forests (*Erythronio-Carpinion*)
- 91M0 Pannonian-Balkan turkey oak –sessile oak forests
- 91N0 * Pannonic inland sand dune thicket (*Junipero-Populetum albae*)
- 91P0 Holy Cross fir forest (*Abietetum polonicum*)
- 91Q0 Western Carpathian calcicolous *Pinus sylvestris* forests
- 91R0 Dinaric dolomite Scots pine forests (*Genisto januensis-Pinetum*)
- 91S0 * Western Pontic beech forests
- 91T0 Central European lichen Scots pine forests
- 91U0 Sarmatic steppe pine forest
- 91V0 Dacian Beech forests (*Symphyto-Fagion*)
- 91W0 Moesian beech forests
- 91X0 * Dobrogean beech forests
- 91Y0 Dacian oak & hornbeam forests
- 91Z0 Moesian silver lime woods
- 91AA * Eastern white oak woods
- 91BA Moesian silver fir forests
- 91CA Rhodopide and Balkan Range Scots pine forests

92. Mediterranean deciduous forests

- 9210 * Apennine beech forests with *Taxus* and *Ilex*
- 9220 * Apennine beech forests with *Abies alba* and beech forests with *Abies nebrodensis*
- 9230 Galicio-Portuguese oak woods with *Quercus robur* and *Quercus pyrenaica*
- 9240 *Quercus faginea* and *Quercus canariensis* Iberian woods
- 9250 *Quercus trojana* woods
- 9260 *Castanea sativa* woods
- 9270 Hellenic beech forests with *Abies borisii-regis*
- 9280 *Quercus frainetto* woods
- 9290 *Cupressus* forests (*Acero-Cupression*)
- 92A0 *Salix alba* and *Populus alba* galleries
- 92B0 Riparian formations on intermittent Mediterranean water courses with *Rhododendron ponticum*, *Salix* and others
- 92C0 *Platanus orientalis* and *Liquidambar orientalis* woods (*Platanion orientalis*)
- 92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)

93. Mediterranean sclerophyllous forests

- 9310 Aegean *Quercus brachyphylla* woods
- 9320 *Olea* and *Ceratonia* forests
- 9330 *Quercus suber* forests
- 9340 *Quercus ilex* and *Quercus rotundifolia* forests
- 9350 *Quercus macrolepis* forests
- 9360 * Macaronesian laurel forests (*Laurus*, *Ocotea*)
- 9370 * Palm groves of Phoenix
- 9380 Forests of *Ilex aquifolium*
- 9390 * Scrub and low forest vegetation with *Quercus alnifolia*
- 93A0 Woodlands with *Quercus infectoria* (*Anagyro foetidae-Quercetum infectoriae*)

94. Temperate mountainous coniferous forests

- 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)
- 9420 Alpine *Larix decidua* and/or *Pinus cembra* forests
- 9430 Subalpine and montane *Pinus uncinata* forests (* if on gypsum or limestone)

95. Mediterranean and Macaronesian mountainous coniferous forests

- 9510 * Southern Apennine *Abies alba* forests
- 9520 *Abies pinsapo* forests
- 9530 * (Sub-) Mediterranean pine forests with endemic black pines
- 9540 Mediterranean pine forests with endemic Mesogean pines
- 9550 Canarian endemic pine forests
- 9560 * Endemic forests with *Juniperus* spp.
- 9570 * *Tetraclinis articulata* forests
- 9580 * Mediterranean *Taxus baccata* woods
- 9590 * *Cedrus brevifolia* forests (*Cedrosetum brevifoliae*)
- 95A0 High oro-Mediterranean pine forests

*ANNEX II***ANIMAL AND PLANT SPECIES OF COMMUNITY INTEREST WHOSE CONSERVATION REQUIRES THE DESIGNATION OF SPECIAL AREAS OF CONSERVATION****Interpretation**

(a) Annex II follows on from Annex I for the establishment of a consistent network of special areas of conservation.

(b) The species listed in this Annex are indicated:

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- by the name of the species or subspecies, or
- by all the species belonging to a higher taxon or to a designated part of that taxon.

The abbreviation “spp.” after the name of a family or genus designates all the species belonging to that family or genus.

(c) Symbols

An asterisk (*) before the name of a species indicates that it is a priority species.

Most species listed in this Annex are also listed in Annex IV. Where a species appears in this Annex but does not appear in either Annex IV or Annex V, the species name is followed by the symbol (o); where a species which appears in this Annex also appears in Annex V but does not appear in Annex IV, its name is followed by the symbol (V).

(a) ANIMALS

VERTEBRATES

MAMMALS

INSECTIVORA

Talpidae

Galemys pyrenaicus

CHIROPTERA

Rhinolophidae

Rhinolophus blasii
Rhinolophus euryale
Rhinolophus ferrumequinum
Rhinolophus hipposideros
Rhinolophus mehelyi

Vespertilionidae

Barbastella barbastellus
Miniopterus schreibersii
Myotis bechsteinii
Myotis blythii
Myotis capaccinii
Myotis dasycneme
Myotis emarginatus
Myotis myotis

Pteropodidae

Rousettus aegyptiacus

RODENTIA

Gliridae

Myomimus roachi

Sciuridae

- * *Marmota marmota latirostris*
- * *Pteromys volans* (*Sciuropterus ruscicus*)
- Spermophilus citellus* (*Citellus citellus*)
- * *Spermophilus suslicus* (*Citellus suslicus*)

Castoridae

Castor fiber (except the Estonian, Latvian, Lithuanian, Finnish and Swedish populations)

Cricetidae

Mesocricetus newtoni

Microtidae

- Dinaromys bogdanovi*
- Microtus cabrerai*
- * *Microtus oeconomus arenicola*
- * *Microtus oeconomus mehelyi*
- Microtus tatricus*

Zapodidae

Sicista subtilis

CARNIVORA

Canidae

- * *Alopex lagopus*
- * *Canis lupus* (except the Estonian population; Greek populations: only south of the 39th parallel; Spanish populations: only those south of the Duero; Latvian, Lithuanian and Finnish populations).

Ursidae

- * *Ursus arctos* (except the Estonian, Finnish, and Swedish populations)

Mustelidae

- * *Gulo gulo*
- Lutra lutra*
- Mustela eversmannii*

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* *Mustela lutreola*
Vormela peregusna

Felidae

Lynx lynx (except the Estonian, Latvian and Finnish populations)
 * *Lynx pardinus*

Phocidae

Halichoerus grypus (V)
 * *Monachus monachus*
Phoca hispida bottnica (V)
 * *Phoca hispida saimensis*
Phoca vitulina (V)

ARTIODACTYLA

Cervidae

* *Cervus elaphus corsicanus*
Rangifer tarandus fennicus (o)

Bovidae

* *Bison bonasus*
Capra aegagrus (natural populations)
 * *Capra pyrenaica pyrenaica*
Ovis gmelini musimon (*Ovis ammon musimon*) (natural populations
 — Corsica and Sardinia)
Ovis orientalis ophion (*Ovis gmelini ophion*)
 * *Rupicapra pyrenaica ornata* (*Rupicapra rupicapra ornata*)
Rupicapra rupicapra balcanica
 * *Rupicapra rupicapra tatica*

CETACEA

Phocoena phocoena
Tursiops truncatus

REPTILES

CHELONIA (TESTUDINES)

Testudinidae

Testudo graeca
Testudo hermanni
Testudo marginata

Cheloniidae

* *Caretta caretta*
 * *Chelonia mydas*

Emydidae

- Emys orbicularis*
- Mauremys caspica*
- Mauremys leprosa*

SAURIA

Lacertidae

- Dinarolacerta mosorensis*
- Lacerta bonnali* (*Lacerta monticola*)
- Lacerta monticola*
- Lacerta schreiberi*
- Gallotia galloti insulanagae*
- * *Gallotia simonyi*
- Podarcis lilfordi*
- Podarcis pityusensis*

Scincidae

- Chalcides simonyi* (*Chalcides occidentalis*)

Gekkonidae

- Phyllodactylus europaeus*

OPHIDIA (SERPENTES)

Colubridae

- * *Coluber cypriensis*
- Elaphe quatuorlineata*
- Elaphe situla*
- * *Natrix natrix cypriaca*

Viperidae

- * *Macrovipera schweizeri* (*Vipera lebetina schweizeri*)
- Vipera ursinii* (except *Vipera ursinii rakosiensis* and *Vipera ursinii macrops*)
- * *Vipera ursinii macrops*
- * *Vipera ursinii rakosiensis*

AMPHIBIANS

CAUDATA

Salamandridae

- Chioglossa lusitanica*
- Mertensiella luschani* (*Salamandra luschani*)
- * *Salamandra aurorae* (*Salamandra atra aurorae*)
- Salamandrina terdigitata*

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Triturus carnifex (*Triturus cristatus carnifex*)
Triturus cristatus (*Triturus cristatus cristatus*)
Triturus dobrogicus (*Triturus cristatus dobrogicus*)
Triturus karelinii (*Triturus cristatus karelinii*)
Triturus montandoni
Triturus vulgaris ampelensis

Proteidae

* *Proteus anguinus*

Plethodontidae

Hydromantes (*Speleomantes*) *ambrosii*
Hydromantes (*Speleomantes*) *flavus*
Hydromantes (*Speleomantes*) *genei*
Hydromantes (*Speleomantes*) *imperialis*
Hydromantes (*Speleomantes*) *strinatii*
Hydromantes (*Speleomantes*) *supramontis*

ANURA

Discoglossidae

* *Alytes muletensis*
Bombina bombina
Bombina variegata
Discoglossus galganoi (including *Discoglossus "jeanneae"*)
Discoglossus montalentii
Discoglossus sardus

Ranidae

Rana latastei

Pelobatidae

* *Pelobates fuscus insubricus*

FISH

PETROMYZONIFORMES

Petromyzonidae

Eudontomyzon spp. (o)
Lampetra fluviatilis (V) (except the Finnish and Swedish populations)
Lampetra planeri (o) (except the Estonian, Finnish, and Swedish populations)
Lethenteron zanandreaei (V)
Petromyzon marinus (o) (except the Swedish populations)

ACIPENSERIFORMES

Acipenseridae

* *Acipenser naccarii** *Acipenser sturio*

CLUPEIFORMES

Clupeidae

Alosa spp. (V)

SALMONIFORMES

Salmonidae

Hucho hucho (natural populations) (V)*Salmo macrostigma* (o)*Salmo marmoratus* (o)*Salmo salar* (only in fresh water) (V) (except the Finnish populations)*Salmothymus obtusirostris* (o)

Coregonidae

* *Coregonus oxyrhynchus* (anadromous populations in certain sectors of the North Sea)

Umbridae

Umbra krameri (o)

CYPRINIFORMES

Cyprinidae

Alburnus albidus (o) (*Alburnus vulturius*)*Aulopyge huegelii* (o)*Anaocypris hispanica**Aspius aspius* (V) (except the Finnish populations)*Barbus comiza* (V)*Barbus meridionalis* (V)*Barbus plebejus* (V)*Chalcalburnus chalcoides* (o)*Chondrostoma genei* (o)*Chondrostoma knerii* (o)*Chondrostoma lusitanicum* (o)*Chondrostoma phoxinus* (o)*Chondrostoma polylepis* (o) (including *C. willkommi*)*Chondrostoma soetta* (o)*Chondrostoma toxostoma* (o)*Gobio albipinnatus* (o)*Gobio kessleri* (o)*Gobio uranoscopus* (o)

Iberocypris palaciosi (o)
 * *Ladigesocypris ghigii* (o)
Leuciscus lucumonis (o)
Leuciscus souffia (o)
Pelecus cultratus (V)
Phoxinellus spp. (o)
 * *Phoxinus percnurus*
Rhodeus sericeus amarus (o)
Rutilus pigus (V)
Rutilus rubilio (o)
Rutilus arcasii (o)
Rutilus macrolepidotus (o)
Rutilus lemmingii (o)
Rutilus frisii meidingeri (V)
Rutilus alburnoides (o)
Scardinius graecus (o)
Squalius microlepis (o)
Squalius svallize (o)

Cobitidae

Cobitis elongata (o)
Cobitis taenia (o) (except the Finnish populations)
Cobitis trichonica (o)
Misgurnus fossilis (o)
Sabanejewia aurata (o)
Sabanejewia larvata (o) (*Cobitis larvata* and *Cobitis conspersa*)

SILURIFORMES

Siluridae

Silurus aristotelis (V)

ATHERINIFORMES

Cyprinodontidae

Aphanius iberus (o)
Aphanius fasciatus (o)
 * *Valencia hispanica*
 * *Valencia letourneuxi* (*Valencia hispanica*)

PERCIFORMES

Percidae

Gymnocephalus baloni
Gymnocephalus schraetzer (V)
 * *Romanichthys valsanicola*
Zingel spp. ((o) except *Zingel asper* and *Zingel zingel* (V))

Gobiidae

- Knipowitschia croatica* (o)
- Knipowitschia (Padogobius) panizzae* (o)
- Padogobius nigricans* (o)
- Pomatoschistus canestrini* (o)

SCORPAENIFORMES

Cottidae

- Cottus gobio* (o) (except the Finnish populations)
- Cottus petiti* (o)

INVERTEBRATES

ARTHROPODS

CRUSTACEA

Decapoda

- Austropotamobius pallipes* (V)
- * *Austropotamobius torrentium* (V)

Isopoda

- * *Armadillidium ghardalamensis*

INSECTA

Coleoptera

- Agathidium pulchellum* (o)
- Bolbelasmus unicornis*
- Boros schneideri* (o)
- Buprestis splendens*
- Carabus hampei*
- Carabus hungaricus*
- * *Carabus menetriesi pacholei*
- * *Carabus olympiae*
- Carabus variolosus*
- Carabus zawadzskii*
- Cerambyx cerdo*
- Corticaria planula* (o)
- Cucujus cinnaberinus*
- Dorcadion fulvum cervae*
- Duvalius gebhardti*
- Duvalius hungaricus*
- Dytiscus latissimus*
- Graphoderus bilineatus*
- Leptodirus hochenwarti*
- Limoniscus violaceus* (o)

1991-11

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Lucanus cervus (o)*Macrolea pubipennis* (o)*Mesosa myops* (o)*Morimus funereus* (o)* *Osmoderma eremita**Oxyporus mannerheimii* (o)*Pilemia tigrina** *Phryganophilus ruficollis**Probaticus subrugosus**Propomacrus cypriacus** *Pseudogaurotina excellens**Pseudoseriscius cameroni**Pytho kolwensis**Rhysodes sulcatus* (o)* *Rosalia alpina**Stephanopachys linearis* (o)*Stephanopachys substriatus* (o)*Xyletinus tremulicola* (o)

Hemiptera

Aradus angularis (o)

Lepidoptera

Agriades glandon aquilo (o)*Arytrura musculus** *Callimorpha (Euplagia, Panaxia) quadripunctaria* (o)*Catopta thrips**Chondrosoma fiduciarium**Clossiana improba* (o)*Coenonympha oedippus**Colias myrmidone**Cucullia mixta**Dioszeghyana schmidtii**Erannis ankeraria**Erebia calcaria**Erebia christi**Erebia medusa polaris* (o)*Eriogaster catax**Euphydryas (Eurodryas, Hypodryas) aurinia* (o)*Glyphipterix loricatella**Gortyna borelii lunata**Graellsia isabellae* (V)*Hesperia comma catena* (o)*Hypodryas maturna**Leptidea morsei**Lignyopectera fumidaria**Lycaena dispar**Lycaena helle*

Maculinea nausithous
Maculinea teleius
Melanargia arge
 * *Nymphalis vaualbum*
Papilio hospiton
Phyllometra culminaria
Plebicula golgus
Polymixis rufocincta isolata
Polyommatus eroides
Proterebia afra dalmata
Pseudophilotes bavius
Xestia borealis (o)
Xestia brunneopicta (o)
 * *Xylomoia strix*

Mantodea

Apteromantis aptera

Odonata

Coenagrion hylas (o)
Coenagrion mercuriale (o)
Coenagrion ornatum (o)
Cordulegaster heros
Cordulegaster trinacriae
Gomphus graslinii
Leucorrhinia pectoralis
Lindenia tetraphylla
Macromia splendens
Ophiogomphus cecilia
Oxygastra curtisii

Orthoptera

Baetica ustulata
Brachytrupes megacephalus
Isophya costata
Isophya harzi
Isophya stysi
Myrmecophilus baronii
Odontopodisma rubripes
Paracaloptenus caloptenoides
Pholidoptera transsylvanica
Stenobothrus (Stenobothrodes) eurasius

ARACHNIDA

Pseudoscorpiones

Anthrenochernes stellae (o)

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MOLLUSCS

GASTROPODA

Anisus vorticulus
Caseolus calculus
Caseolus commixta
Caseolus sphaerula
Chilostoma banaticum
Discula leacockiana
Discula tabellata
Discus guerinianus
Elona quimperiana
Geomalacus maculosus
Geomitra moniziana
Gibbula nivosa
 * *Helicopsis striata austriaca* (o)
Hygromia kovacsi
Idiomela (Helix) subplicata
Lampedusa imitatrix
 * *Lampedusa melitensis*
Leiostyla abbreviata
Leiostyla cassida
Leiostyla corneocostata
Leiostyla gibba
Leiostyla lamellosa
 * *Paladilhia hungarica*
Sadleriana pannonica
Theodoxus transversalis
Vertigo angustior (o)
Vertigo genesii (o)
Vertigo geyeri (o)
Vertigo moulinsiana (o)

BIVALVIA

Unionoida

Margaritifera durrovensis (Margaritifera margaritifera) (V)
Margaritifera margaritifera (V)
Unio crassus

Dreissenidae

Congeria kusceri

(b) PLANTS

PTERIDOPHYTA

ASPLENIACEAE

Asplenium jahandiezii (Litard.) Rouy
Asplenium adulterinum Milde

BLECHNACEAE

Woodwardia radicans (L.) Sm.

DICKSONIACEAE

Culcita macrocarpa C. Presl

DRYOPTERIDACEAE

Diplazium sibiricum (Turcz. ex Kunze) Kurata
* *Dryopteris corleyi* Fraser-Jenk.
Dryopteris fragans (L.) Schott

HYMENOPHYLLACEAE

Trichomanes speciosum Willd.

ISOETACEAE

Isoetes boryana Durieu
Isoetes malinverniana Ces. & De Not.

MARSILEACEAE

Marsilea batardae Launert
Marsilea quadrifolia L.
Marsilea strigosa Willd.

OPHIOGLOSSACEAE

Botrychium simplex Hitchc.
Ophioglossum polyphyllum A. Braun

GYMNOSPERMAE**PINACEAE**

* *Abies nebrodensis* (Lojac.) Mattei

ANGIOSPERMAE**ALISMATACEAE**

* *Alisma wahlenbergii* (Holmberg) Juz.
Caldesia parnassifolia (L.) Parl.
Luronium natans (L.) Raf.

AMARYLLIDACEAE

Leucojum nicaeense Ard.
Narcissus asturiensis (Jordan) Pugsley
Narcissus calcicola Mendonça
Narcissus cyclamineus DC.
Narcissus fernandesii G. Pedro
Narcissus humilis (Cav.) Traub
* *Narcissus nevadensis* Pugsley
Narcissus pseudonarcissus L. subsp. *nobilis* (Haw.) A. Fernandes
Narcissus scaberulus Henriq.
Narcissus triandrus L. subsp. *capax* (Salisb.) D. A. Webb.
Narcissus viridiflorus Schousboe

ASCLEPIADACEAE

Vincetoxicum pannonicum (Borhidi) Holub

BORAGINACEAE

* *Anchusa crispa* Viv.
Echium russicum J.F.Gemlin
* *Lithodora nitida* (H. Ern) R. Fernandes
Myosotis lusitanica Schuster
Myosotis rehsteineri Wartm.
Myosotis retusifolia R. Afonso
Omphalodes kuzinskyanae Willk.
* *Omphalodes littoralis* Lehm.
* *Onosma tornensis* Javorka
Solenanthus albanicus (Degen & al.) Degen & Baldacci
* *Symphytum cycladense* Pawl.

CAMPANULACEAE

Adenophora lilifolia (L.) Ledeb.
Asyneuma giganteum (Boiss.) Bornm.
* *Campanula bohemica* Hruby
* *Campanula gelida* Kovanda
Campanula romanica Săvul.
* *Campanula sabatia* De Not.
* *Campanula serrata* (Kit.) Hendrych
Campanula zoyssii Wulfen
Jasione crispa (Pourret) Samp. subsp. *serpentinica* Pinto da Silva
Jasione lusitanica A. DC.

CARYOPHYLLACEAE

- Arenaria ciliata* L. subsp. *pseudofrigida* Ostenf. & O.C. Dahl
Arenaria humifusa Wahlenberg
 * *Arenaria nevadensis* Boiss. & Reuter
Arenaria provincialis Chater & Halliday
 * *Cerastium alsinifolium* Tausch
Cerastium dinaricum G. Beck & Szysz.
Dianthus arenarius L. subsp. *arenarius*
 * *Dianthus arenarius* subsp. *bohemicus* (Novak) O.Schwarz
Dianthus cintranus Boiss. & Reuter subsp. *Cintranus* Boiss. & Reuter
 * *Dianthus diutinus* Kit.
 * *Dianthus lumnitzeri* Wiesb.
Dianthus marizii (Samp.) Samp.
 * *Dianthus moravicus* Kovanda
 * *Dianthus nitidus* Waldst. et Kit.
Dianthus plumarius subsp. *regis-stephani* (Rapcs.) Baksay
Dianthus rupicola Biv.
 * *Gypsophila papillosa* P. Porta
Herniaria algarvica Chaudhri
 * *Herniaria latifolia* Lapeyr. subsp. *litardierei* Gamis
Herniaria lusitanica (Chaudhri) subsp. *Berlengiana* Chaudhri
Herniaria maritima Link
 * *Minuartia smejkalii* Dvorakova
Moehringia jankae Griseb. ex Janka
Moehringia lateriflora (L.) Fenzl.
Moehringia tommasinii Marches.
Moehringia villosa (Wulfen) Fenzl
Petrocoptis grandiflora Rothm.
Petrocoptis montsicciana O. Bolos & Rivas Mart.
Petrocoptis pseudoviscosa Fernández Casas
Silene furcata Rafin. subsp. *angustiflora* (Rupr.) Walters
 * *Silene hicesiae* Brullo & Signorello
Silene hifacensis Rouy ex Willk.
 * *Silene holzmanii* Heldr. ex Boiss.
Silene longicilia (Brot.) Otth.
Silene mariana Pau
 * *Silene orphanidis* Boiss
 * *Silene rothmaleri* Pinto da Silva
 * *Silene velutina* Pourret ex Loisel.

CHENOPODIACEAE

- * *Bassia (Kochia) saxicola* (Guss.) A. J. Scott
 * *Cremnophyton lanfranconi* Brullo et Pavone
 * *Salicornia veneta* Pignatti & Lausi

CISTACEAE

- Cistus palhinhae* Ingram
Halimium verticillatum (Brot.) Sennen
Helianthemum alypoides Losa & Rivas Goday
Helianthemum caput-felis Boiss.
 * *Tuberaria major* (Willk.) Pinto da Silva & Rozeira

COMPOSITAE

- * *Anthemis glaberrima* (Rech. f.) Greuter
Artemisia campestris L. subsp. *bottnica* A.N. Lundström ex Kindb.
 * *Artemisia granatensis* Boiss.
 * *Artemisia laciniata* Willd.
Artemisia oelandica (Besser) Komaror
 * *Artemisia pancicii* (Janka) Ronn.
 * *Aster pyrenaicus* Desf. ex DC
 * *Aster sorrentinii* (Tod) Lojac.
Carlina onopordifolia Besser
 * *Carduus myriacanthus* Salzm. ex DC.
 * *Centaurea alba* L. subsp. *heldreichii* (Halacsy) Dostal
 * *Centaurea alba* L. subsp. *princeps* (Boiss. & Heldr.) Gugler
 * *Centaurea akamantis* T. Georgiadis & G. Chatzikyriakou
 * *Centaurea attica* Nyman subsp. *megarensis* (Halacsy & Hayek) Dostal
 * *Centaurea balearica* J. D. Rodriguez
 * *Centaurea borjajae* Valdes-Berm. & Rivas Goday
 * *Centaurea citricolor* Font Quer
Centaurea corymbosa Pourret
Centaurea gadorensis G. Blanca
 * *Centaurea horrida* Badaro
Centaurea immanuelis-loewii Degen
Centaurea jankae Brandza
 * *Centaurea kalambakensis* Freyn & Sint.
Centaurea kartschiana Scop.
 * *Centaurea lactiflora* Halacsy
Centaurea micrantha Hoffmanns. & Link subsp. *Herminii* (Rouy) Dostál
 * *Centaurea niederi* Heldr.
 * *Centaurea peucedanifolia* Boiss. & Orph.
 * *Centaurea pinnata* Pau
Centaurea pontica Prodan & E. I. Nyárády
Centaurea pulvinata (G. Blanca) G. Blanca
Centaurea rothmalerana (Arènes) Dostál
Centaurea vicentina Mariz
Cirsium brachycephalum Juratzka
 * *Crepis crocifolia* Boiss. & Heldr.

Crepis granatensis (Willk.) B. Blanca & M. Cueto
Crepis pusilla (Sommier) Merxmüller
Crepis tectorum L. subsp. *nigrescens*
Erigeron frigidus Boiss. ex DC.
 * *Helichrysum melitense* (Pignatti) Brullo et al
Hymenostemma pseudanthemis (Kunze) Willd.
Hyoseris frutescens Brullo et Pavone
 * *Jurinea cyanoides* (L.) Reichenb.
 * *Jurinea fontqueri* Cuatrec.
 * *Lamyropsis microcephala* (Moris) Dittrich & Greuter
Leontodon microcephalus (Boiss. ex DC.) Boiss.
Leontodon boryi Boiss.
 * *Leontodon siculus* (Guss.) Finch & Sell
Leuzea longifolia Hoffmanns. & Link
Ligularia sibirica (L.) Cass.
 * *Palaeocyanus crassifolius* (Bertoloni) Dostal
Santolina impressa Hoffmanns. & Link
Santolina semidentata Hoffmanns. & Link
Saussurea alpina subsp. *esthonica* (Baer ex Rupr) Kupffer
 * *Senecio elodes* Boiss. ex DC.
Senecio jacobea L. subsp. *gotlandicus* (Neuman) Sterner
Senecio nevadensis Boiss. & Reuter
 * *Serratula lycopifolia* (Vill.) A.Kern
Tephroseris longifolia (Jacq.) Griseb et Schenk subsp. *moravica*

CONVOLVULACEAE

* *Convolvulus argyrothamnus* Greuter
 * *Convolvulus fernandesii* Pinto da Silva & Teles

CRUCIFERAE

Alyssum pyrenaicum Lapeyr.
 * *Arabis kennedyae* Meikle
Arabis sadina (Samp.) P. Cout.
Arabis scopoliana Boiss
 * *Biscutella neustriaca* Bonnet
Biscutella vincentina (Samp.) Rothm.
Boleum asperum (Pers.) Desvaux
Brassica glabrescens Poldini
Brassica hilarionis Post
Brassica insularis Moris
 * *Brassica macrocarpa* Guss.
Braya linearis Rouy
 * *Cochlearia polonica* E. Fröhlich
 * *Cochlearia tatrae* Borbas
 * *Coincya rupestris* Rouy
 * *Coronopus navasii* Pau

Crambe tataria Sebeok
 **Degenia velebitica* (Degen) Hayek
Diploaxis ibicensis (Pau) Gómez-Campo
 * *Diploaxis siettiana* Maire
Diploaxis vicentina (P. Cout.) Rothm.
Draba cacuminum Elis Ekman
Draba cinerea Adams
Draba dorneri Heuffel.
Erucastrum palustre (Pirona) Vis.
 * *Erysimum pieninicum* (Zapal.) Pawl.
 * *Iberis arbuscula* Runemark
Iberis procumbens Lange subsp. *microcarpa* Franco & Pinto da Silva
 * *Jonopsidium acaule* (Desf.) Reichenb.
Jonopsidium savianum (Caruel) Ball ex Arcang.
Rhynchosinapis erucastrum (L.) Dandy ex Clapham subsp. *cintrana* (Coutinho) Franco & P. Silva (*Coincya cintrana* (P. Cout.) Pinto da Silva)
Sisymbrium cavanillesianum Valdés & Castroviejo
Sisymbrium supinum L.
Thlaspi jankae A.Kern.

CYPERACEAE

Carex holostoma Drejer
 * *Carex panormitana* Guss.
Eleocharis carniolica Koch

DIOSCOREACEAE

* *Borderea chouardii* (Gaussen) Heslot

DROSERACEAE

Aldrovanda vesiculosa L.

ELATINACEAE

Elatine gussonei (Sommier) Brullo et al

ERICACEAE

Rhododendron luteum Sweet

EUPHORBIACEAE

* *Euphorbia margalidiana* Kuhbier & Lewejohann
Euphorbia transtagana Boiss.

GENTIANACEAE

- * *Centaurium rigualii* Esteve
- * *Centaurium somedanum* Lainz
- Gentiana ligustica* R. de Vilm. & Chopinet
- Gentianella anglica* (Pugsley) E. F. Warburg
- * *Gentianella bohemica* Skalicky

GERANIACEAE

- * *Erodium astragaloides* Boiss. & Reuter
- Erodium paularense* Fernández-González & Izco
- * *Erodium rupicola* Boiss.

GLOBULARIACEAE

- * *Globularia stygia* Orph. ex Boiss.

GRAMINEAE

- Arctagrostis latifolia* (R. Br.) Griseb.
- Arctophila fulva* (Trin.) N. J. Anderson
- Avenula hackelii* (Henriq.) Holub
- Bromus grossus* Desf. ex DC.
- Calamagrostis chalybaea* (Laest.) Fries
- Cinna latifolia* (Trev.) Griseb.
- Coleanthus subtilis* (Tratt.) Seidl
- Festuca brigantina* (Markgr.-Dannenb.) Markgr.-Dannenb.
- Festuca duriotagana* Franco & R. Afonso
- Festuca elegans* Boiss.
- Festuca henriquesii* Hack.
- Festuca summilusitana* Franco & R. Afonso
- Gaudinia hispanica* Stace & Tutin
- Holcus setiglumis* Boiss. & Reuter subsp. *duriensis* Pinto da Silva
- Micropyropsis tuberosa* Romero — Zarco & Cabezudo
- Poa granitica* Br.-Bl. subsp. *disparilis* (E. I. Nyárády) E. I. Nyárády
- * *Poa riphaea* (Ascher et Graebner) Fritsch
- Pseudarrhenatherum pallens* (Link) J. Holub
- Puccinellia phryganodes* (Trin.) Scribner + Merr.
- Puccinellia pungens* (Pau) Paunero
- * *Stipa austroitalica* Martinovsky
- * *Stipa bavarica* Martinovsky & H. Scholz
- Stipa danubialis* Dihoru & Roman
- * *Stipa styriaca* Martinovsky
- * *Stipa veneta* Moraldo
- * *Stipa zalesskii* Wilensky
- Trisetum subalpestre* (Hartman) Neuman

GROSSULARIACEAE

* *Ribes sardoum* Martelli

HIPURIDACEAE

Hippuris tetraphylla L. Fil.

HYPERICACEAE

* *Hypericum aciferum* (Greuter) N.K.B. Robson

IRIDACEAE

Crocus cyprius Boiss. et Kotschy

Crocus hartmannianus Holmboe

Gladiolus palustris Gaud.

Iris aphylla L. subsp. *hungarica* Hegi

Iris humilis Georgi subsp. *arenaria* (Waldst. et Kit.) A. et D.Löve

JUNCACEAE

Juncus valvatus Link

Luzula arctica Blytt

LABIATAE

Dracocephalum austriacum L.

* *Micromeria taygetea* P. H. Davis

Nepeta dirphya (Boiss.) Heldr. ex Halacsy

* *Nepeta sphaciotica* P. H. Davis

Origanum dictamnus L.

Phlomis brevibracteata Turril

Phlomis cypria Post

Salvia veneris Hedge

Sideritis cypria Post

Sideritis incana subsp. *glauca* (Cav.) Malagarriga

Sideritis javalambrensis Pau

Sideritis serrata Cav. ex Lag.

Teucrium lepicephalum Pau

Teucrium turredanum Losa & Rivas Goday

* *Thymus camphoratus* Hoffmanns. & Link

Thymus carnosus Boiss.

* *Thymus lotocephalus* G. López & R. Morales (*Thymus cephalotos* L.)

LEGUMINOSAE

Anthyllis hystrix Cardona, Contandr. & E. Sierra
 * *Astragalus algarbiensis* Coss. ex Bunge
 * *Astragalus aquilanus* Anzalone
Astragalus centralpinus Braun-Blanquet
 * *Astragalus macrocarpus* DC. subsp. *lefkarensis*
 * *Astragalus maritimus* Moris
Astragalus peterfii Jáv.
Astragalus tremolsianus Pau
 * *Astragalus verrucosus* Moris
 * *Cytisus aeolicus* Guss. ex Lindl.
Genista dorycnifolia Font Quer
Genista holopetala (Fleischm. ex Koch) Baldacci
Melilotus segetalis (Brot.) Ser. subsp. *fallax* Franco
 * *Ononis hackelii* Lange
Trifolium saxatile All.
 * *Vicia bifoliolata* J.D. Rodríguez

LENTIBULARIACEAE

* *Pinguicula crystallina* Sm.
Pinguicula nevadensis (Lindb.) Casper

LILIACEAE

Allium grosii Font Quer
 * *Androcymbium rechingeri* Greuter
 * *Asphodelus bento-rainhae* P. Silva
 * *Chionodoxa lochiai* Meikle in Kew Bull.
Colchicum arenarium Waldst. et Kit.
Hyacinthoides vicentina (Hoffmans. & Link) Rothm.
 * *Muscari gussonei* (Parl.) Tod.
Scilla litardierei Breist.
 * *Scilla morrisii* Meikle
Tulipa cypria Stapf
Tulipa hungarica Borbas

LINACEAE

* *Linum dolomiticum* Borbas
 * *Linum muelleri* Moris (*Linum maritimum muelleri*)

LYTHRACEAE

* *Lythrum flexuosum* Lag.

MALVACEAE

Nature Protection

Kosteletzkya pentacarpos (L.) Ledeb.

NAJADACEAE

Najas flexilis (Willd.) Rostk. & W.L. Schmidt

Najas tenuissima (A. Braun) Magnus

OLEACEAE

Syringa josikaea Jacq. Fil. ex Reichenb.

ORCHIDACEAE

Anacamptis urvilleana Sommier et Caruana Gatto

Calypso bulbosa L.

* *Cephalanthera cucullata* Boiss. & Heldr.

Cypripedium calceolus L.

Dactylorhiza kalopissii E.Nelson

Gymnigritella runei Teppner & Klein

Himantoglossum adriaticum Baumann

Himantoglossum caprinum (Bieb.) V.Koch

Liparis loeselii (L.) Rich.

* *Ophrys kotschyi* H.Fleischm. et Soo

* *Ophrys lunulata* Parl.

Ophrys melitensis (Salkowski) J et P Devillers-Terschuren

Platanthera obtusata (Pursh) subsp. *oligantha* (Turez.) Hulten

OROBANCHACEAE

Orobanche densiflora Salzm. ex Reut.

PAEONIACEAE

Paeonia cambessedesii (Willk.) Willk.

Paeonia clusii F.C. Stern subsp. *rhodia* (Stearn) Tzanoudakis

Paeonia officinalis L. subsp. *banatica* (Rachel) Soo

Paeonia parnassica Tzanoudakis

PALMAE

Phoenix theophrasti Greuter

PAPAVERACEAE

Corydalis gotlandica Lidén

Papaver laestadianum (Nordh.) Nordh.

Papaver radicum Rottb. subsp. *hyperboreum* Nordh.

PLANTAGINACEAE

Plantago algarbiensis Sampaio (*Plantago bracteosa* (Willk.) G. Sampaio)
Plantago almogravensis Franco

PLUMBAGINACEAE

Armeria berlengensis Daveau
 * *Armeria helodes* Martini & Pold
Armeria neglecta Girard
Armeria pseudarmeria (Murray) Mansfeld
 * *Armeria rouyana* Daveau
Armeria soleirolii (Duby) Godron
Armeria velutina Welw. ex Boiss. & Reuter
Limonium dodartii (Girard) O. Kuntze subsp. *lusitanicum* (Daveau) Franco
 * *Limonium insulare* (Beg. & Landi) Arrig. & Diana
Limonium lanceolatum (Hoffmans. & Link) Franco
Limonium multiflorum Erben
 * *Limonium pseudolaetum* Arrig. & Diana
 * *Limonium strictissimum* (Salzmann) Arrig.

POLYGONACEAE

Persicaria foliosa (H. Lindb.) Kitag.
Polygonum praelongum Coode & Cullen
Rumex rupestris Le Gall

PRIMULACEAE

Androsace mathildae Levier
Androsace pyrenaica Lam.
 * *Cyclamen fatrense* Halda et Sojak
 * *Primula apennina* Widmer
Primula carniolica Jacq.
Primula nutans Georgi
Primula palinuri Petagna
Primula scandinavica Bruun
Soldanella villosa Darracq.

RANUNCULACEAE

* *Aconitum corsicum* Gayer (*Aconitum napellus* subsp. *corsicum*)
Aconitum firmum (Reichenb.) Neilr subsp. *moravicum* Skalicky
Adonis distorta Ten.
Aquilegia bertolonii Schott
Aquilegia kitaibelii Schott

1991-11

Nature Protection

- * *Aquilegia pyrenaica* D.C. subsp. *cazorlensis* (Heywood) Galiano
- * *Consolida samia* P.H. Davis
- * *Delphinium caseyi* B.L. Burtt
- Pulsatilla grandis* Wenderoth *Pulsatilla patens* (L.) Miller
- * *Pulsatilla pratensis* (L.) Miller subsp. *hungarica* Soo
- * *Pulsatilla slavica* G. Reuss.
- * *Pulsatilla subslavica* Futak ex Goliasova
- Pulsatilla vulgaris* Hill. subsp. *gotlandica* (Johanss.) Zaemelis & Paegle
- Ranunculus kykkoensis* Meikle
- Ranunculus lapponicus* L.
- * *Ranunculus weyleri* Mares

RESEDACEAE

- * *Reseda decursiva* Forssk.

ROSACEAE

- Agrimonia pilosa* Ledebour
- Potentilla delphinensis* Gren. & Godron
- Potentilla emilii-popii* Nyárády
- * *Pyrus magyarica* Terpo
- Sorbus teodorii* Liljefors

RUBIACEAE

- Galium cracoviense* Ehrend.
- * *Galium litorale* Guss.
- Galium moldavicum* (Dobrescu) Franco
- * *Galium sudeticum* Tausch
- * *Galium viridiflorum* Boiss. & Reuter

SALICACEAE

- Salix salvifolia* Brot. subsp. *australis* Franco

SANTALACEAE

- Thesium ebracteatum* Hayne

SAXIFRAGACEAE

- Saxifraga berica* (Beguinot) D.A. Webb
- Saxifraga florulenta* Moretti
- Saxifraga hirculus* L.
- Saxifraga osloënsis* Knaben
- Saxifraga tombeanensis* Boiss. ex Engl.

SCROPHULARIACEAE

Antirrhinum charidemi Lange

Chaenorhinum serpyllifolium (Lange) Lange subsp. *lusitanicum* R.

Fernandes

* *Euphrasia genargentea* (Feoli) Diana

Euphrasia marchesettii Wettst. ex Marches.

Linaria algarviana Chav.

Linaria coutinhoi Valdés

Linaria loeselii Schweigger

* *Linaria ficalhoana* Rouy

Linaria flava (Poiret) Desf.

* *Linaria hellenica* Turrill

Linaria pseudolaxiflora Lojacono

* *Linaria ricardoï* Cout.

Linaria tonzigii Lona

* *Linaria tursica* B. Valdés & Cabezudo *Odontites granatensis*

Boiss.

* *Pedicularis sudetica* Willd.

Rhinanthus oesilensis (Ronniger & Saarsoo) Vassilcz

Tozzia carpathica Wol.

Verbascum litigiosum Samp.

Veronica micrantha Hoffmanns. & Link

* *Veronica oetaea* L.-A. Gustavsson

SOLANACEAE

* *Atropa baetica* Willk.

THYMELAEACEAE

* *Daphne arbuscula* Celak

Daphne petraea Leybold

* *Daphne rodriguezii* Texidor

ULMACEAE

Zelkova abelicea (Lam.) Boiss.

UMBELLIFERAE

* *Angelica heterocarpa* Lloyd

Angelica palustris (Besser) Hoffm.

* *Apium bermejoi* Llorens

Apium repens (Jacq.) Lag.

Athamanta cortiana Ferrarini

* *Bupleurum capillare* Boiss. & Heldr.

- * *Bupleurum kakiskalae* Greuter
- Eryngium alpinum* L.
- * *Eryngium viviparum* Gay
- * *Ferula sadleriana* Lebed.
- Hladnikia pastinacifolia* Reichenb.
- * *Laserpitium longiradium* Boiss.
- * *Naufraga balearica* Constans & Cannon
- * *Oenanthe conioides* Lange
- Petagnia saniculifolia* Guss.
- Rouya polygama* (Desf.) Coincy
- * *Seseli intricatum* Boiss.
- Seseli leucospermum* Waldst. et Kit
- Thorella verticillatinundata* (Thore) Briq.

VALERIANACEAE

- Centranthus trinervis* (Viv.) Beguinot

VIOLACEAE

- Viola delphinantha* Boiss.
- * *Viola hispida* Lam.
- Viola jaubertiana* Mares & Vigineix
- Viola rupestris* F.W. Schmidt subsp. *relicta* Jalas

LOWER PLANTS

BRYOPHYTA

- Bruchia vogesiaca* Schwaegr. (o)
- Bryhnia novae-angliae* (Sull & Lesq.) Grout (o)
- * *Bryoerythrophyllum campylocarpum* (C. Müll.) Crum.
- (*Bryoerythrophyllum machadoanum* (Sergio) M. O. Hill) (o)
- Buxbaumia viridis* (Moug.) Moug. & Nestl. (o)
- Cephalozia macounii* (Aust.) Aust. (o)
- Cynodontium suecicum* (H. Arn. & C. Jens.) I. Hag. (o)
- Dichelyma capillaceum* (Dicks) Myr. (o)
- Dicranum viride* (Sull. & Lesq.) Lindb. (o)
- Distichophyllum carinatum* Dix. & Nich. (o)
- Drepanocladus (Hamatocaulis) vernicosus* (Mitt.) Warnst. (o)
- Encalypta mutica* (I. Hagen) (o)
- Hamatocaulis lapponicus* (Norrl.) Hedenäs (o)
- Herzogiella turfacea* (Lindb.) I. Wats. (o)
- Hygrohypnum montanum* (Lindb.) Broth. (o)
- Jungermannia handelii* (Schiffn.) Amak. (o)
- Mannia triandra* (Scop.) Grolle (o)
- * *Marsupella profunda* Lindb. (o)
- Meesia longiseta* Hedw. (o)
- Nothothylas orbicularis* (Schwein.) Sull. (o)

Ochyraea tatrensis Vana (o)
Orthothecium lapponicum (Schimp.) C. Hartm. (o)
Orthotrichum rogeri Brid. (o)
Petalophyllum ralfsii (Wils.) Nees & Gott. (o)
Plagiomnium drummondii (Bruch & Schimp.) T. Kop. (o)
Riccia breidleri Jur. (o)
Riella helicophylla (Bory & Mont.) Mont. (o)
Scapania massolongi (K. Müll.) K. Müll. (o)
Sphagnum pylaisii Brid. (o)
Tayloria rudolphiana (Garov) B. & S. (o)
Tortella rigens (N. Albers) (o)

SPECIES FOR MACARONESIA

PTERIDOPHYTA

HYMENOPHYLLACEAE

Hymenophyllum maderensis Gibby & Lovis

DRYOPTERIDACEAE

* *Polystichum drepanum* (Sw.) C. Presl.

ISOETACEAE

Isoetes azorica Durieu & Paiva ex Milde

MARSILEACEAE

* *Marsilea azorica* Launert & Paiva

ANGIOSPERMAE

ASCLEPIADACEAE

Caralluma burchardii N. E. Brown
 * *Ceropegia chrysantha* Svent.

BORAGINACEAE

Echium candicans L. fil.
 * *Echium gentianoides* Webb & Coincy
Myosotis azorica H. C. Watson
Myosotis maritima Hochst. in Seub.

CAMPANULACEAE

1991-11

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- * *Azorina vidalii* (H. C. Watson) Feer
- Musschia aurea* (L. f.) DC.
- * *Musschia wollastonii* Lowe

CAPRIFOLIACEAE

- * *Sambucus palmensis* Link

CARYOPHYLLACEAE

- Spergularia azorica* (Kindb.) Lebel

CELASTRACEAE

- Maytenus umbellata* (R. Br.) Mabb.

CHENOPODIACEAE

- Beta patula* Ait.

CISTACEAE

- Cistus chinamadensis* Banares & Romero
- * *Helianthemum bystropogophyllum* Svent.

COMPOSITAE

- Andryala crithmifolia* Ait.
- * *Argyranthemum lidii* Humphries
- Argyranthemum thalassophyllum* (Svent.) Hump.
- Argyranthemum winterii* (Svent.) Humphries
- * *Atractylis arbuscula* Svent. & Michaelis
- Atractylis preauxiana* Schultz.
- Calendula maderensis* DC.
- Cheirolophus duranii* (Burchard) Holub
- Cheirolophus ghomerytus* (Svent.) Holub
- Cheirolophus junonianus* (Svent.) Holub
- Cheirolophus massonianus* (Lowe) Hansen & Sund.
- Cirsium latifolium* Lowe
- Helichrysum gossypinum* Webb
- Helichrysum monogynum* Burt & Sund.
- Hypochoeris oligocephala* (Svent. & Bramw.) Lack
- * *Lactuca watsoniana* Trel.
- * *Onopordum nogalesii* Svent.
- * *Onopordum carduelinum* Bolle
- * *Pericallis hadrosoma* (Svent.) B. Nord.
- Phagnalon benettii* Lowe
- Stemmacantha cynaroides* (Chr. Son. in Buch) Ditt

Sventenia bupleuroides Font Quer
* *Tanacetum ptarmiciflorum* Webb & Berth

CONVOLVULACEAE

* *Convolvulus caput-medusae* Lowe
* *Convolvulus lopez-socasii* Svent.
* *Convolvulus massonii* A. Dietr.

CRASSULACEAE

Aeonium gomeraense Praeger
Aeonium saundersii Bolle
Aichryson dumosum (Lowe) Praeg.
Monanthes wildpretii Banares & Scholz
Sedum brissemoretii Raymond-Hamet

CRUCIFERAE

* *Crambe arborea* Webb ex Christ
Crambe laevigata DC. ex Christ
* *Crambe sventenii* R. Petters ex Bramwell & Sund.
* *Parolinia schizogynoides* Svent.
Sinapidendron rupestre (Ait.) Lowe

CYPERACEAE

Carex malato-belizii Raymond

DIPSACACEAE

Scabiosa nitens Roemer & J. A. Schultes

ERICACEAE

Erica scoparia L. subsp. *azorica* (Hochst.) D. A. Webb

EUPHORBIACEAE

* *Euphorbia handiensis* Burchard
Euphorbia lambii Svent.
Euphorbia stygiana H. C. Watson

GERANIACEAE

* *Geranium maderense* P. F. Yeo

GRAMINEAE

Deschampsia maderensis (Haeck. & Born.) Buschm.
Phalaris maderensis (Menezes) Menezes

GLOBULARIACEAE

* *Globularia ascanii* D. Bramwell & Kunkel
 * *Globularia sarcophylla* Svent.

LABIATAE

* *Sideritis cystosiphon* Svent.
 * *Sideritis discolor* (Webb ex de Noe) Bolle
Sideritis infernalis Bolle
Sideritis marmorea Bolle
Teucrium abutiloides L'Hér.
Teucrium betonicum L'Hér.

LEGUMINOSAE

* *Anagyris latifolia* Brouss. ex. Willd.
Anthyllis lemanniana Lowe
 * *Dorycnium spectabile* Webb & Berthel
 * *Lotus azoricus* P. W. Ball
Lotus callis-viridis D. Bramwell & D. H. Davis
 * *Lotus kunkelii* (E. Chueca) D. Bramwell & al.
 * *Teline rosmarinifolia* Webb & Berthel.
 * *Teline salsoloides* Arco & Acebes.
Vicia dennesiana H. C. Watson

LILIACEAE

* *Androcymbium psammophilum* Svent.
Scilla maderensis Menezes
Semele maderensis Costa

LORANTHACEAE

Arceuthobium azoricum Wiens & Hawksw.

MYRICACEAE

* *Myrica rivas-martinezii* Santos.

OLEACEAE

Jasminum azoricum L.
Picconia azorica (Tutin) Knobl.

ORCHIDACEAE

Goodyera macrophylla Lowe

PITTOSPORACEAE

* *Pittosporum coriaceum* Dryand. ex. Ait.

PLANTAGINACEAE

Plantago malato-belizii Lawalree

PLUMBAGINACEAE

* *Limonium arborescens* (Brouss.) Kuntze

Limonium dendroides Svent.

* *Limonium spectabile* (Svent.) Kunkel & Sunding

* *Limonium sventenii* Santos & Fernández Galván

POLYGONACEAE

Rumex azoricus Rech. fil.

RHAMNACEAE

Frangula azorica Tutin

ROSACEAE

* *Bencomia brachystachya* Svent.

Bencomia sphaerocarpa Svent.

* *Chamaemeles coriacea* Lindl.

Dendriopoterium pulidoi Svent.

Marcetella maderensis (Born.) Svent.

Prunus lusitanica L. subsp. *azorica* (Mouillef.) Franco

Sorbus maderensis (Lowe) Dode

SANTALACEAE

Kunkeliella subsucculenta Kammer

SCROPHULARIACEAE

* *Euphrasia azorica* H.C. Watson

Euphrasia grandiflora Hochst. in Seub.

* *Isoplexis chalcantha* Svent. & O'Shanahan

Isoplexis isabelliana (Webb & Berthel.) Masferrer

Nature Protection

Odontites holliana (Lowe) Benth.
Sibthorpia peregrina L.

SOLANACEAE

* *Solanum lidii* Sunding

UMBELLIFERAE

Ammi trifoliatum (H. C. Watson) Trelease
Bupleurum handiense (Bolle) Kunkel
Chaerophyllum azoricum Trelease
Ferula latipinna Santos
Melanoselinum decipiens (Schrader & Wendl.) Hoffm.
Monizia edulis Lowe
Oenanthe divaricata (R. Br.) Mabb.
Sanicula azorica Guthnick ex Seub.

VIOLACEAE

Viola paradoxa Lowe

LOWER PLANTS

BRYOPHYTA

* *Echinodium spinosum* (Mitt.) Jur. (o)
* *Thamnobryum fernandesii* Sergio (o).

ANNEX III

CRITERIA FOR SELECTING SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE AND DESIGNATION AS SPECIAL AREAS OF CONSERVATION

STAGE 1: Assessment at national level of the relative importance of sites for each natural habitat type in Annex I and each species in Annex II (including priority natural habitat types and priority species)

A. *Site assessment criteria for a given natural habitat type in Annex I*

- (a) Degree of representativity of the natural habitat type on the site.
- (b) Area of the site covered by the natural habitat type in relation to the total area covered by that natural habitat type within national territory.

(c) Degree of conservation of the structure and functions of the natural habitat type concerned and restoration possibilities.

(d) Global assessment of the value of the site for conservation of the natural habitat type concerned.

B. Site assessment criteria for a given species in Annex II

(a) Size and density of the population of the species present on the site in relation to the populations present within national territory.

(b) Degree of conservation of the features of the habitat which are important for the species concerned and restoration possibilities.

(c) Degree of isolation of the population present on the site in relation to the natural range of the species.

(d) Global assessment of the value of the site for conservation of the species concerned.

C. On the basis of these criteria, Member States will classify the sites which they propose on the national list as sites eligible for identification as sites of Community importance according to their relative value for the conservation of each natural habitat type in Annex I or each species in Annex II.

D. That list will show the sites containing the priority natural habitat types and priority species selected by the Member States on the basis of the criteria in A and B above.

STAGE 2: Assessment of the Community importance of the sites included on the national lists

1. All the sites identified by the Member States in Stage 1 which contain priority natural habitat types and/or species will be considered as sites of Community importance.

2. The assessment of the Community importance of other sites on Member States' lists, i.e. their contribution to maintaining or re-establishing, at a favourable conservation status, a natural habitat in Annex I or a species in Annex II and/or to the coherence of Natura 2000 will take account of the following criteria:

(a) relative value of the site at national level;

(b) geographical situation of the site in relation to migration routes of species in Annex II and whether it belongs to a continuous ecosystem situated on both sides of one or more internal Community frontiers;

- (c) total area of the site;
- (d) number of natural habitat types in Annex I and species in Annex II present on the site;
- (e) global ecological value of the site for the biogeographical regions concerned and/or for the whole of the territory referred to in Article 2, as regards both the characteristic or unique aspect of its features and the way they are combined.

ANNEX IV

**ANIMAL AND PLANT SPECIES OF COMMUNITY INTEREST IN
NEED OF STRICT PROTECTION**

The species listed in this Annex are indicated:

- by the name of species or subspecies, or
- by the body of species belonging to a higher taxon or to a designated part of that taxon.

The abbreviation “spp.” after the name of a family or genus designates all the species belonging to that family or genus.

(a) **ANIMALS**

VERTEBRATES

MAMMALS

INSECTIVORA

Erinaceidae

Erinaceus algirus

Soricidae

Crocidura canariensis

Crocidura sicula

Talpidae

Galemys pyrenaicus

MICROCHIROPTERA

All species

MEGACHIROPTERA

Pteropodidae

Rousettus aegyptiacus

RODENTIA

Gliridae

All species except *Glis glis* and *Eliomys quercinus*

Sciuridae

Marmota marmota latirostris

Pteromys volans (*Sciuropterus russicus*)

Spermophilus citellus (*Citellus citellus*)

Spermophilus suslicus (*Citellus suslicus*)

Sciurus anomalus

Castoridae

Castor fiber (except the Estonian, Latvian, Lithuanian, Polish, Finnish and Swedish, populations)

Cricetidae

Cricetus cricetus (except the Hungarian populations)

Mesocricetus newtoni

Microtidae

Dinaromys bogdanovi

Microtus cabrerai

Microtus oeconomus arenicola

Microtus oeconomus mehelyi

Microtus tatricus

Zapodidae

Sicista betulina

Sicista subtilis

Hystricidae

Hystrix cristata

CARNIVORA

Canidae

Alopex lagopus

Canis lupus (except the Greek populations north of the 39th parallel; Estonian populations, Spanish populations north of the Duero; Bulgarian, Latvian, Lithuanian, Polish, Slovak populations and Finnish populations within the reindeer management area as defined

1991-11

Nature Protection

in paragraph 2 of the Finnish Act No 848/90 of 14 September 1990
on reindeer management)

Ursidae

Ursus arctos

Mustelidae

Lutra lutra

Mustela eversmanii

Mustela lutreola

Vormela peregusna

Felidae

Felis silvestris

Lynx lynx (except the Estonian population)

Lynx pardinus

Phocidae

Monachus monachus

Phoca hispida saimensis

ARTIODACTYLA

Cervidae

Cervus elaphus corsicanus

Bovidae

Bison bonasus

Capra aegagrus (natural populations)

Capra pyrenaica pyrenaica

Ovis gmelini musimon (*Ovis ammon musimon*) (natural populations
— Corsica and Sardinia)

Ovis orientalis ophion (*Ovis gmelini ophion*)

Rupicapra pyrenaica ornata (*Rupicapra rupicapra ornata*)

Rupicapra rupicapra balcanica

Rupicapra rupicapra tatraica

CETACEA

All species

REPTILES

TESTUDINATA

Testudinidae

Testudo graeca

Testudo hermanni

Testudo marginata

Cheloniidae

Caretta caretta

Chelonia mydas

Lepidochelys kempii

Eretmochelys imbricata

Dermochelyidae

Dermochelys coriacea

Emydidae

Emys orbicularis

Mauremys caspica

Mauremys leprosa

SAURIA

Lacertidae

Algyroides fitzingeri

Algyroides marchi

Algyroides moreoticus

Algyroides nigropunctatus

Dalmatolacerta oxycephala

Dinarolacerta mosorensis

Gallotia atlantica

Gallotia galloti

Gallotia galloti insulanagae

Gallotia simonyi

Gallotia stehlini

Lacerta agilis

Lacerta bedriagae

Lacerta bonnali (*Lacerta monticola*)

Lacerta monticola

Lacerta danfordi

Lacerta dugesi

Lacerta graeca

Lacerta horvathi

Lacerta schreiberi

Lacerta trilineata

Lacerta viridis

Lacerta vivipara pannonica

Ophisops elegans

Podarcis erhardii

Podarcis filfolensis

Podarcis hispanica atrata

Podarcis lilfordi

Podarcis melisellensis

1991-11

Nature Protection

Podarcis milensis
Podarcis muralis
Podarcis peloponnesiaca
Podarcis pityusensis
Podarcis sicula
Podarcis taurica
Podarcis tiliguerta
Podarcis wagleriana

Scincidae

Ablepharus kitaibelii
Chalcides bedriagai
Chalcides ocellatus
Chalcides sexlineatus
Chalcides simonyi (Chalcides occidentalis)
Chalcides viridianus
Ophiomorus punctatissimus
 Gekkonidae
Cyrtopodion kotschy
Phyllodactylus europaeus
Tarentola angustimentalis
Tarentola boettgeri
Tarentola delalandii
Tarentola gomerensis

Agamidae

Stellio stellio

Chamaeleontidae

Chamaeleo chamaeleon

Anguidae

Ophisaurus apodus

OPHIDIA

Colubridae
Coluber caspius
Coluber cypriensis
Coluber hippocrepis
Coluber jugularis
Coluber laurenti
Coluber najadum
Coluber nummifer
Coluber viridiflavus
Coronella austriaca
Eirenis modesta
Elaphe longissima
Elaphe quatuorlineata

Elaphe situla
Natrix natrix cetti
Natrix natrix corsa
Natrix natrix cypriaca
Natrix tessellata
Telescopus falax

Viperidae

Vipera ammodytes
Macrovipera schweizeri (*Vipera lebetina schweizeri*)
Vipera seoanni (except Spanish populations)
Vipera ursinii
Vipera xanthina

Boidae

Eryx jaculus

AMPHIBIANS

CAUDATA

Salamandridae

Chioglossa lusitanica
Euproctus asper
Euproctus montanus
Euproctus platycephalus
Mertensiella luschani (*Salamandra luschani*)
Salamandra atra
Salamandra aurorae
Salamandra lanzai
Salamandrina terdigitata
Triturus carnifex (*Triturus cristatus carnifex*)
Triturus cristatus (*Triturus cristatus cristatus*)
Triturus italicus
Triturus karelinii (*Triturus cristatus karelinii*)
Triturus marmoratus
Triturus montandoni
Triturus vulgaris ampelensis

Proteidae

Proteus anguinus

Plethodontidae

Hydromantes (*Speleomantes*) *ambrosii*
Hydromantes (*Speleomantes*) *flavus*
Hydromantes (*Speleomantes*) *genei*
Hydromantes (*Speleomantes*) *imperialis*
Hydromantes (*Speleomantes*) *strinatii* (*Hydromantes*)

1991-11

Nature Protection

*(Speleomantes) italicus)**Hydromantes (Speleomantes) supramontis*

ANURA

*Discoglossidae**Alytes cisternasii**Alytes muletensis**Alytes obstetricans**Bombina bombina**Bombina variegata**Discoglossus galganoi* (including *Discoglossus "jeanneae"*)*Discoglossus montalentii**Discoglossus pictus**Discoglossus sardus*

Ranidae

*Rana arvalis**Rana dalmatina**Rana graeca**Rana iberica**Rana italica**Rana latastei**Rana lessonae**Pelobatidae**Pelobates cultripes**Pelobates fuscus**Pelobates syriacus*

Bufonidae

*Bufo calamita**Bufo viridis**Hylidae**Hyla arborea**Hyla meridionalis**Hyla sarda***FISH**

ACIPENSERIFORMES

Acipenseridae

*Acipenser naccarii**Acipenser sturio*

SALMONIFORMES

Coregonidae

Coregonus oxyrhynchus (anadromous populations in certain sectors of the North Sea, except the Finnish populations)

CYPRINIFORMES

Cyprinidae

Anaocypris hispanica
Phoxinus phoxinus

ATHERINIFORMES

Cyprinodontidae

Valencia hispanica

PERCIFORMES

Percidae

Gymnocephalus baloni
Romanichthys valsanicola
Zingel asper

INVERTEBRATES

ARTHROPODS

CRUSTACEA

Isopoda

Armadillidium ghardalamensis

INSECTA

Coleoptera

Bolbelasmus unicornis
Buprestis splendens
Carabus hampei
Carabus hungaricus
Carabus olympiae
Carabus variolosus
Carabus zawadzskii
Cerambyx cerdo
Cucujus cinnaberinus
Dorcadion fulvum cervae
Duvalius gebhardti
Duvalius hungaricus
Dytiscus latissimus
Graphoderus bilineatus
Leptodirus hochenwarti
Pilemia tigrina

1991-11

Nature Protection

Osmoderma eremita
Phryganophilus ruficollis
Probaticus subrugosus
Propomacrus cypriacus
Pseudogaurotina excellens
Pseudoseriscius cameroni
Pytho kolwensis
Rosalia alpina
 Lepidoptera
Apatura metis
Arytrura musculus
Catopta thrips
Chondrosoma fiduciarium
Coenonympha hero
Coenonympha oedippus
Colias myrmidone
Cucullia mixta
Dioszeghyana schmidtii
Erannis ankeraria
Erebia calcaria
Erebia christi
Erebia sudetica
Eriogaster catax
Fabriciana elisa
Glyphipterix loricatella
Gortyna borelii lunata
Hypodryas maturna
Hyles hippophaes
Leptidea morsei
Lignyopectera fumidaria
Lopinga achine
Lycaena dispar
Lycaena helle
Maculinea arion
Maculinea nausithous
Maculinea teleius
Melanargia arge
Nymphalis vaualbum
Papilio alexanor
Papilio hospiton
Parnassius apollo
Parnassius mnemosyne
Phyllometra culminaria
Plebicula golgus
Polymixis rufocincta isolata
Polyommatus eroides
Proserpinus Proserpina
Proterebia afra dalmata

Pseudophilotes bavius
Xylomoia strix
Zerynthia polyxena

Mantodea

Apteromantis aptera

Odonata

Aeshna viridis
Cordulegaster heros
Cordulegaster trinacriae
Gomphus graslinii
Leucorrhinia albifrons
Leucorrhinia caudalis
Leucorrhinia pectoralis
Lindenia tetraphylla
Macromia splendens
Ophiogomphus cecilia
Oxygastra curtisii
Stylurus flavipes
Sympecma braueri

Orthoptera

Baetica ustulata
Brachytrupes megacephalus
Isophya costata
Isophya harzi
Isophya stysi
Myrmecophilus baronii
Odontopodisma rubripes
Paracaloptenus caloptenoides
Pholidoptera transsylvanica
Saga pedo
Stenobothrus (Stenobothrodes) eurasius

ARACHNIDA

Araneae

Macrothele calpeiana

MOLLUSCS

GASTROPODA

Anisus vorticulus
Caseolus calculus
Caseolus commixta
Caseolus sphaerula
Chilostoma banaticum

1991-11

Nature Protection

Discula leacockiana
Discula tabellata
Discula testudinalis
Discula turricula
Discus defloratus
Discus guerinianus
Elona quimperiana
Geomalacus maculosus
Geomitra moniziana
Gibbula nivosa
Hygromia kovacsi
Idiomela (Helix) subplicata
Lampedusa imitatrix
Lampedusa melitensis
Leiostyla abbreviata
Leiostyla cassida
Leiostyla corneocostata
Leiostyla gibba
Leiostyla lamellosa
Paladilhia hungarica
Patella ferruginea
Sadleriana pannonica
Theodoxus prevostianus
Theodoxus transversalis

BIVALVIA

Anisomyaria

Lithophaga lithophaga
Pinna nobilis

Unionoida

Margaritifera auricularia
Unio crassus

Dreissenidae

Congeria kusceri

ECHINODERMATA

Echinoidea

Centrostephanus longispinus

(b) PLANTS

Annex IV (b) contains all the plant species listed in Annex II (b)^(*) plus those mentioned below:

^(*) Except bryophytes in Annex II (b).

PTERIDOPHYTA

ASPLENIACEAE

Asplenium hemionitis L.

ANGIOSPERMAE

AGAVACEAE

Dracaena draco (L.) L.

AMARYLLIDACEAE

Narcissus longispathus Pugsley

Narcissus triandrus L.

BERBERIDACEAE

Berberis maderensis Lowe

CAMPANULACEAE

Campanula morettiana Reichenb.

Physoplexis comosa (L.) Schur.

CARYOPHYLLACEAE

Moehringia fontqueri Pau

COMPOSITAE

Argyranthemum pinnatifidum (L.f.) Lowe subsp. *succulentum*

(Lowe) C. J. Humphries

Helichrysum sibthorpii Rouy

Picris willkommii (Schultz Bip.) Nyman

Santolina elegans Boiss. ex DC.

Senecio caespitosus Brot.

Senecio lagascanus DC. subsp. *lusitanicus* (P. Cout.) Pinto da Silva

Wagenitzia lancifolia (Sieber ex Sprengel) Dostal

CRUCIFERAE

Murbeckiella sousae Rothm.

EUPHORBIACEAE

Euphorbia nevadensis Boiss. & Reuter

1991-11

Nature Protection

GESNERIACEAE

Jankaia heldreichii (Boiss.) Boiss.
Ramonda serbica Pancic

IRIDACEAE

Crocus etruscus Parl.
Iris boissieri Henriq.
Iris marisca Ricci & Colasante

LABIATAE

Rosmarinus tomentosus Huber-Morath & Maire
Teucrium charidemi Sandwith
Thymus capitellatus Hoffmanns. & Link
Thymus villosus L. subsp. *villosus* L.

LILIACEAE

Androcymbium europaeum (Lange) K. Richter
Bellevalia hackelli Freyn
Colchicum corsicum Baker
Colchicum cousturieri Greuter
Fritillaria conica Rix
Fritillaria drenovskii Degen & Stoy.
Fritillaria gussichiae (Degen & Doerfler) Rix
Fritillaria obliqua Ker-Gawl.
Fritillaria rhodocanakis Orph. ex Baker
Ornithogalum reverchonii Degen & Herv.-Bass.
Scilla beirana Samp.
Scilla odorata Link

ORCHIDACEAE

Ophrys argolica Fleischm.
Orchis scopulorum Simsmerh.
Spiranthes aestivalis (Poiret) L. C. M. Richard

PRIMULACEAE

Androsace cylindrica DC.
Primula glaucescens Moretti
Primula spectabilis Tratt.

RANUNCULACEAE

Aquilegia alpina L.

SAPOTACEAE

Sideroxylon marmulano Banks ex Lowe

SAXIFRAGACEAE

Saxifraga cintrana Kuzinsky ex Willk.

Saxifraga portosanctana Boiss.

Saxifraga presolanensis Engl.

Saxifraga valdensis DC.

Saxifraga vayredana Luizet

SCROPHULARIACEAE

Antirrhinum lopesianum Rothm.

Lindernia procumbens (Krocker) Philcox

SOLANACEAE

Mandragora officinarum L.

THYMELAEACEAE

Thymelaea broterana P. Cout.

UMBELLIFERAE

Bunium brevifolium Lowe

VIOLACEAE

Viola athis W. Becker

Viola cazorlensis Gandoger

ANNEX V

**ANIMAL AND PLANT SPECIES OF COMMUNITY INTEREST
WHOSE TAKING IN THE WILD AND EXPLOITATION MAY BE
SUBJECT TO MANAGEMENT MEASURES**

The species listed in this Annex are indicated:

— by the name of the species or subspecies, or

— by the body of species belonging to a higher taxon or to a designated part of that taxon.

1991-11

Nature Protection

The abbreviation “spp.” after the name of a family or genus designates all the species belonging to that family or genus.

(a) *ANIMALS*

VERTEBRATES

MAMMALS

RODENTIA

Castoridae

Castor fiber (Finnish, Swedish, Latvian, Lithuanian, Estonian and Polish populations)

Cricetidae

Cricetus cricetus (Hungarian populations)

CARNIVORA

Canidae

Canis aureus

Canis lupus (Spanish populations north of the Duero, Greek populations north of the 39th parallel, Finnish populations within the reindeer management area as defined in paragraph 2 of the Finnish Act No 848/90 of 14 September 1990 on reindeer management, Bulgarian, Latvian, Lithuanian, Estonian, Polish and Slovak populations)

Mustelidae

Martes martes

Mustela putorius

Felidae

Lynx lynx (Estonian population)

Phocidae

All species not mentioned in Annex IV

Viverridae

Genetta genetta

Herpestes ichneumon

DUPLICIDENTATA

Leporidae

Lepus timidus

ARTIODACTYLA

Bovidae

*Capra ibex**Capra pyrenaica (except Capra pyrenaica pyrenaica)**Rupicapra rupicapra (except Rupicapra rupicapra balcanica,**Rupicapra rupicapra ornata and Rupicapra rupicapra tatrica)***AMPHIBIANS****ANURA**

Ranidae

*Rana esculenta**Rana perezi**Rana ridibunda**Rana temporaria***FISH****PETROMYZONIFORMES**

Petromyzonidae

*Lampetra fluviatilis**Lethenteron zanandrai***ACIPENSERIFORMES**

Acipenseridae

*All species not mentioned in Annex IV***CLUPEIFORMES**

Clupeidae

*Alosa spp.***SALMONIFORMES**

Salmonidae

*Thymallus thymallus**Coregonus spp. (except Coregonus oxyrhynchus — anadromous populations in certain sectors of the North Sea)**Hucho hucho**Salmo salar (only in fresh water)***CYPRINIFORMES**

1991-11

Nature Protection

Cyprinidae

Aspius aspius
Barbus spp.
Pelecus cultratus
Rutilus friesii meidingeri
Rutilus pigus

SILURIFORMES

Siluridae

Silurus aristotelis

PERCIFORMES

Percidae

Gymnocephalus schraetzer
Zingel zingel

INVERTEBRATES

COELENTERATA

CNIDARIA

Corallium rubrum

MOLLUSCA

GASTROPODA — STYLOMMATOPHORA

Helix pomatia

BIVALVIA — UNIONOIDA

Margaritiferidae

Margaritifera margaritifera

Unionidae

Microcondylaea compressa
Unio elongatulus

ANNELIDA

HIRUDINOIDEA — ARHYNCHOBDELLAE

Hirudinidae
Hirudo medicinalis

ARTHROPODA

CRUSTACEA — DECAPODA

Astacidae

*Astacus astacus**Austropotamobius pallipes**Austropotamobius torrentium*

Scyllaridae

Scyllarides latus

INSECTA — LEPIDOPTERA

Saturniidae

Graellsia isabellae

(b) PLANTS

ALGAE

RHODOPHYTA

CORALLINACEAE

Lithothamnium coralloides Crouan frat.*Phymatholithon calcareum* (Poll.) Adey & McKibbin

LICHENES

CLADONIACEAE

Cladonia L. subgenus *Cladina* (Nyl.) Vain.

BRYOPHYTA

MUSCI

LEUCOBRYACEAE

Leucobryum glaucum (Hedw.) AAngstr.

SPHAGNACEAE

Sphagnum L. spp. (except *Sphagnum pylaisii* Brid.)

PTERIDOPHYTA

Lycopodium spp.

ANGIOSPERMAE

AMARYLLIDACEAE

Galanthus nivalis L.
Narcissus bulbocodium L.
Narcissus juncifolius Lagasca

COMPOSITAE

Arnica montana L.
Artemisia eriantha Tem
Artemisia genipi Weber
Doronicum plantagineum L. subsp. *tournefortii* (Rouy) P. Cout.
Leuzea rhaponticoides Graells

CRUCIFERAE

Alyssum pintadasilvae Dudley.
Malcolmia lacera (L.) DC. subsp. *gracilima* (Samp.) Franco
Murbeckiella pinnatifida (Lam.) Rothm. subsp. *herminii* (Rivas-Martinez) Greuter & Burdet

GENTIANACEAE

Gentiana lutea L.

IRIDACEAE

Iris lusitanica Ker-Gawler

LABIATAE

Teucrium salviastrum Schreber subsp. *salviastrum* Schreber

LEGUMINOSAE

Anthyllis lusitanica Cullen & Pinto da Silva
Dorycnium pentaphyllum Scop. subsp. *transmontana* Franco
Ulex densus Welw. ex Webb.

LILIACEAE

Lilium rubrum Lmk
Ruscus aculeatus L.

PLUMBAGINACEAE

Armeria sampaio (Bernis) Nieto Feliner

ROSACEAE

Rubus genevieri Boreau subsp. *herminii* (Samp.) P. Cout.

SCROPHULARIACEAE

Anarrhinum longipedicelatum R. Fernandes

Euphrasia mendonçae Samp.

Scrophularia grandiflora DC. subsp. *grandiflora* DC.

Scrophularia berminii Hoffmanns & Link

Scrophularia sublyrata Brot.

ANNEX VI

**PROHIBITED METHODS AND MEANS OF CAPTURE AND
KILLING AND MODES OF TRANSPORT**

(a) **Non-selective means**

MAMMALS

- Blind or mutilated animals used as live decoys
- Tape recorders
- Electrical and electronic devices capable of killing or stunning
- Artificial light sources
- Mirrors and other dazzling devices
- Devices for illuminating targets
- Sighting devices for night shooting comprising an electronic image magnifier or image converter
- Explosives
- Nets which are non-selective according to their principle or their conditions of use
- Traps which are non-selective according to their principle or their conditions of use

1991-11

Nature Protection

- Crossbows
- Poisons and poisoned or anaesthetic bait
- Gassing or smoking out
- Semi-automatic or automatic weapons with magazine capable of holding more than two rounds of ammunition

FISH

- Poison
- Explosives

(b) Modes of transport

- Aircraft
- Moving motor vehicles

SCHEDULE 6

Section 17V

**ANIMALS WHICH MAY NOT BE TAKEN OR KILLED IN
CERTAIN WAYS**

Common Name	Scientific Name
Barbel	Barbus barbus
Seal, Mediterranean Monk	Monachus monachus

NOTE. The common name or names given in the first column of this Schedule are included by way of guidance only; in the event of any dispute or proceedings, the common name or names shall not be taken into account.

SCHEDULE 7*Repealed*

1991-11

Nature Protection

SCHEDULE 8

**THIS SCHEDULE REPRODUCES THE TEXT OF DIRECTIVE
2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE
COUNCIL OF 30 NOVEMBER 2009 ON THE CONSERVATION OF
WILD BIRDS**

Section 2

**DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT
AND OF THE COUNCIL**

**of 30 November 2009
on the conservation of wild birds
(codified version)**

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE
EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in
particular Article 175(1) thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Economic and Social
Committee,

Acting in accordance with the procedure laid down in Article 251 of the
Treaty,

Whereas:

(1) Council Directive 79/409/EEC of 2 April 1979 on the conservation of
wild birds has been substantially amended several times. In the interests of
clarity and rationality the said Directive should be codified.

(2) Decision No 1600/2002/EC of the European Parliament and of the
Council of 22 July 2002 laying down the Sixth Community Environment
Action Programme calls for specific action for biodiversity, including to
protect birds and their habitats.

(3) A large number of species of wild birds naturally occurring in the
European territory of the Member States are declining in number, very
rapidly in some cases. This decline represents a serious threat to the
conservation of the natural environment, particularly because of the
biological balances threatened thereby.

(4) The species of wild birds naturally occurring in the European territory of the Member States are mainly migratory species. Such species constitute a common heritage and effective bird protection is typically a trans-frontier environment problem entailing common responsibilities.

(5) The conservation of the species of wild birds naturally occurring in the European territory of the Member States is necessary in order to attain the Community's objectives regarding the improvement of living conditions and sustainable development.

(6) The measures to be taken must apply to the various factors which may affect the numbers of birds, namely the repercussions of man's activities and in particular the destruction and pollution of their habitats, capture and killing by man and the trade resulting from such practices; the stringency of such measures should be adapted to the particular situation of the various species within the framework of a conservation policy.

(7) Conservation is aimed at the long-term protection and management of natural resources as an integral part of the heritage of the peoples of Europe. It makes it possible to control natural resources and governs their use on the basis of the measures necessary for the maintenance and adjustment of the natural balances between species as far as is reasonably possible.

(8) The preservation, maintenance or restoration of a sufficient diversity and area of habitats is essential to the conservation of all species of birds. Certain species of birds should be the subject of special conservation measures concerning their habitats in order to ensure their survival and reproduction in their area of distribution. Such measures must also take account of migratory species and be coordinated with a view to setting up a coherent whole.

(9) In order to prevent commercial interests from exerting a possible harmful pressure on exploitation levels, it is necessary to impose a general ban on marketing and to restrict all derogation to those species whose biological status so permits, account being taken of the specific conditions obtaining in the different regions.

(10) Because of their high population level, geographical distribution and reproductive rate in the Community as a whole, certain species may be hunted, which constitutes acceptable exploitation where certain limits are established and respected, as such hunting must be compatible with maintenance of the population of these species at a satisfactory level.

(11) The various means, devices or methods of large-scale or non-selective capture or killing and hunting with certain forms of transport must be banned because of the excessive pressure which they exert or may exert on the numbers of the species concerned.

1991-11

Nature Protection

(12) Because of the importance which may be attached to certain specific situations, provision should be made for the possibility of derogations on certain conditions and subject to monitoring by the Commission.

(13) The conservation of birds and, in particular, migratory birds still presents problems which call for scientific research. Such research will also make it possible to assess the effectiveness of the measures taken.

(14) Care should be taken in consultation with the Commission to see that the introduction of any species of wild bird not naturally occurring in the European territory of the Member States does not cause harm to local flora and fauna.

(15) The Commission will every three years prepare and transmit to the Member States a composite report based on information submitted by the Member States on the application of national provisions introduced pursuant to this Directive.

(16) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission.

(17) In particular, the Commission should be empowered to amend certain Annexes in the light of scientific and technical progress. Since those measures are of general scope and are designed to amend non-essential elements of this Directive, they must be adopted in accordance with the regulatory procedure with scrutiny provided for in Article 5a of Decision 1999/468/EC.

(18) This Directive should be without prejudice to the obligations of the Member States relating to the time limits for transposition into national law of the directives set out in Annex VI, Part B,

HAVE ADOPTED THIS DIRECTIVE:

Article 1

1. This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies. It covers the protection, management and control of these species and lays down rules for their exploitation. 2. It shall apply to birds, their eggs, nests and habitats.

Article 2

Member States shall take the requisite measures to maintain the population of the species referred to in Article 1 at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking

account of economic and recreational requirements, or to adapt the population of these species to that level.

Article 3

1. In the light of the requirements referred to in Article 2, Member States shall take the requisite measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Article 1.

2. The preservation, maintenance and re-establishment of biotopes and habitats shall include primarily the following measures:

- (a) creation of protected areas;
- (b) upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones;
- (c) re-establishment of destroyed biotopes;
- (d) creation of biotopes.

Article 4

1. The species mentioned in Annex I shall be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution.

In this connection, account shall be taken of:

- (a) species in danger of extinction;
- (b) species vulnerable to specific changes in their habitat;
- (c) species considered rare because of small populations or restricted local distribution;
- (d) other species requiring particular attention for reasons of the specific nature of their habitat.

Trends and variations in population levels shall be taken into account as a background for evaluations.

Member States shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species in the geographical sea and land area where this Directive applies.

1991-11

Nature Protection

2. Member States shall take similar measures for regularly occurring migratory species not listed in Annex I, bearing in mind their need for protection in the geographical sea and land area where this Directive applies, as regards their breeding, moulting and wintering areas and staging posts along their migration routes. To this end, Member States shall pay particular attention to the protection of wetlands and particularly to wetlands of international importance.

3. Member States shall send the Commission all relevant information so that it may take appropriate initiatives with a view to the coordination necessary to ensure that the areas provided for in paragraphs 1 and 2 form a coherent whole which meets the protection requirements of these species in the geographical sea and land area where this Directive applies.

4. In respect of the protection areas referred to in paragraphs 1 and 2, Member States shall take appropriate steps to avoid pollution or deterioration of habitats or any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article. Outside these protection areas, Member States shall also strive to avoid pollution or deterioration of habitats.

Article 5

Without prejudice to Articles 7 and 9, Member States shall take the requisite measures to establish a general system of protection for all species of birds referred to in Article 1, prohibiting in particular:

- (a) deliberate killing or capture by any method;
- (b) deliberate destruction of, or damage to, their nests and eggs or removal of their nests;
- (c) taking their eggs in the wild and keeping these eggs even if empty;
- (d) deliberate disturbance of these birds particularly during the period of breeding and rearing, in so far as disturbance would be significant having regard to the objectives of this Directive;
- (e) keeping birds of species the hunting and capture of which is prohibited.

Article 6

1. Without prejudice to paragraphs 2 and 3, Member States shall prohibit, for all the bird species referred to in Article 1, the sale, transport for sale, keeping for sale and the offering for sale of live or dead birds and of any readily recognisable parts or derivatives of such birds.

2. The activities referred to in paragraph 1 shall not be prohibited in respect of the species referred to in Annex III, Part A, provided that the birds have been legally killed or captured or otherwise legally acquired.

3. Member States may, for the species listed in Annex III, Part B, allow within their territory the activities referred to in paragraph 1, making provision for certain restrictions, provided that the birds have been legally killed or captured or otherwise legally acquired.

Member States wishing to grant such authorisation shall first of all consult the Commission with a view to examining jointly with the latter whether the marketing of specimens of such species would result or could reasonably be expected to result in the population levels, geographical distribution or reproductive rate of the species being endangered throughout the Community. Should this examination prove that the intended authorisation will, in the view of the Commission, result in any one of the aforementioned species being thus endangered or in the possibility of their being thus endangered, the Commission shall forward a reasoned recommendation to the Member State concerned stating its opposition to the marketing of the species in question. Should the Commission consider that no such risk exists, it shall inform the Member State concerned accordingly.

The Commission's recommendation shall be published in the *Official Journal of the European Union*.

Member States granting authorisation pursuant to this paragraph shall verify at regular intervals that the conditions governing the granting of such authorisation continue to be fulfilled.

Article 7

1. Owing to their population level, geographical distribution and reproductive rate throughout the Community, the species listed in Annex II may be hunted under national legislation. Member States shall ensure that the hunting of these species does not jeopardise conservation efforts in their distribution area.

2. The species referred to in Annex II, Part A may be hunted in the geographical sea and land area where this Directive applies.

3. The species referred to in Annex II, Part B may be hunted only in the Member States in respect of which they are indicated.

4. Member States shall ensure that the practice of hunting, including falconry if practised, as carried on in accordance with the national measures in force, complies with the principles of wise use and ecologically balanced control of the species of birds concerned and that this practice is compatible

Nature Protection

as regards the population of these species, in particular migratory species, with the measures resulting from Article 2.

They shall see in particular that the species to which hunting laws apply are not hunted during the rearing season or during the various stages of reproduction.

In the case of migratory species, they shall see in particular that the species to which hunting regulations apply are not hunted during their period of reproduction or during their return to their rearing grounds.

Member States shall send the Commission all relevant information on the practical application of their hunting regulations.

Article 8

1. In respect of the hunting, capture or killing of birds under this Directive, Member States shall prohibit the use of all means, arrangements or methods used for the large-scale or non-selective capture or killing of birds or capable of causing the local disappearance of a species, in particular the use of those listed in Annex IV, point (a).

2. Moreover, Member States shall prohibit any hunting from the modes of transport and under the conditions mentioned in Annex IV, point (b).

Article 9

1. Member States may derogate from the provisions of Articles 5 to 8, where there is no other satisfactory solution, for the following reasons:

- (a)
 - in the interests of public health and safety,
 - in the interests of air safety,
 - to prevent serious damage to crops, livestock, forests, fisheries and water,
 - for the protection of flora and fauna;
- (b) for the purposes of research and teaching, of re-population, of re-introduction and for the breeding necessary for these purposes;
- (c) to permit, under strictly supervised conditions and on a selective basis, the capture, keeping or other judicious use of certain birds in small numbers.

2. The derogations referred to in paragraph 1 must specify:

- (a) the species which are subject to the derogations;
 - (b) the means, arrangements or methods authorised for capture or killing;
 - (c) the conditions of risk and the circumstances of time and place under which such derogations may be granted;
 - (d) the authority empowered to declare that the required conditions obtain and to decide what means, arrangements or methods may be used, within what limits and by whom;
 - (e) the controls which will be carried out.
3. Each year the Member States shall send a report to the Commission on the implementation of paragraphs 1 and 2.

4. On the basis of the information available to it, and in particular the information communicated to it pursuant to paragraph 3, the Commission shall at all times ensure that the consequences of the derogations referred to in paragraph 1 are not incompatible with this Directive. It shall take appropriate steps to this end.

Article 10

1. Member States shall encourage research and any work required as a basis for the protection, management and use of the population of all species of bird referred to in Article 1. Particular attention shall be paid to research and work on the subjects listed in Annex V.

2. Member States shall send the Commission any information required to enable it to take appropriate measures for the coordination of the research and work referred to in paragraph 1.

Article 11

Member States shall see that any introduction of species of bird which do not occur naturally in the wild state in the European territory of the Member States does not prejudice the local flora and fauna. In this connection they shall consult the Commission.

Article 12

1. Member States shall forward to the Commission every three years, starting from 7 April 1981, a report on the implementation of national provisions taken under this Directive.

Nature Protection

2. The Commission shall prepare every three years a composite report based on the information referred to in paragraph 1. That part of the draft report covering the information supplied by a Member State shall be forwarded to the authorities of the Member State in question for verification. The final version of the report shall be forwarded to the Member States.

Article 13

Application of the measures taken pursuant to this Directive may not lead to deterioration in the present situation as regards the conservation of the species of birds referred to in Article 1.

Article 14

Member States may introduce stricter protective measures than those provided for under this Directive.

Article 15

Such amendments as are necessary for adapting Annexes I and V to technical and scientific progress shall be adopted. Those measures, designed to amend non-essential elements of this Directive, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 16(2).

Article 16

1. The Commission shall be assisted by the Committee for Adaptation to Technical and Scientific Progress.

2. Where reference is made to this paragraph, Article 5a(1) to (4) and Article 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

Article 17

Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field governed by this Directive.

Article 18

Directive 79/409/EEC, as amended by the acts listed in Annex VI, Part A, is repealed, without prejudice to the obligations of the Member States relating to the time limits for transposition into national law of the Directives set out in Annex VI, Part B. References to the repealed Directive shall be construed

as references to this Directive and shall be read in accordance with the correlation table in Annex VII.

Article 19

This Directive shall enter into force on the 20th day following its publication in the *Official Journal of the European Union*.

Article 20

This Directive is addressed to the Member States.

ANNEX I

GAVIIFORMES

Gaviidae

*Gavia stellata**Gavia arctica**Gavia immer*

PODICIPEDIFORMES

Podicipedidae

Podiceps auritus

PROCELLARIIFORMES

Procellariidae

*Pterodroma madeira**Pterodroma feae**Bulweria bulwerii**Calonectris diomedea**Puffinus puffinus mauretanicus* (*Puffinus mauretanicus*)*Puffinus yelkouan**Puffinus assimilis*

Hydrobatidae

*Pelagodroma marina**Hydrobates pelagicus**Oceanodroma leucorhoa**Oceanodroma castro*

PELECANIFORMES

Pelecanidae

*Pelecanus onocrotalus**Pelecanus crispus*

Phalacrocoracidae

*Phalacrocorax aristotelis desmarestii**Phalacrocorax pygmeus*

CICONIIFORMES

Ardeidae

*Botaurus stellaris**Ixobrychus minutus**Nycticorax nycticorax**Ardeola ralloides*

Egretta garzetta
Egretta alba (*Ardea alba*)
Ardea purpurea

Ciconiidae

Ciconia nigra
Ciconia ciconia

Threskiornithidae

Plegadis falcinellus
Platalea leucorodia

PHOENICOPTERIFORMES

Phoenicopteridae

Phoenicopus ruber

ANSERIFORMES

Anatidae

Cygnus bewickii (*Cygnus columbianus bewickii*)
Cygnus cygnus
Anser albifrons flavirostris
Anser erythropus
Branta leucopsis
Branta ruficollis
Tadorna ferruginea
Marmaronetta angustirostris
Aythya nyroca
Polysticta stelleri
Mergus albellus (*Mergellus albellus*)
Oxyura leucocephala

FALCONIFORMES

Pandionidae

Pandion haliaetus

Accipitridae

Pernis apivorus
Elanus caeruleus
Milvus migrans
Milvus milvus
Haliaeetus albicilla
Gypaetus barbatus
Neophron percnopterus
Gyps fulvus
Aegypius monachus

1991-11

Nature Protection

Circaetus gallicus
Circus aeruginosus
Circus cyaneus
Circus macrourus
Circus pygargus
Accipiter gentilis arrigonii
Accipiter nisus granti
Accipiter brevipes
Buteo rufinus
Aquila pomarina
Aquila clanga
Aquila heliaca
Aquila adalberti
Aquila chrysaetos
Hieraaetus pennatus
Hieraaetus fasciatus

Falconidae

Falco naumanni
Falco vespertinus
Falco columbarius
Falco eleonora
Falco biarmicus
Falco cherrug
Falco rusticolus
Falco peregrinus

GALLIFORMES

Tetraonidae

Bonasa bonasia
Lagopus mutus pyrenaicus
Lagopus mutus helveticus
Tetrao tetrix tetrax
Tetrao urogallus

Phasianidae

Alectoris graeca
Alectoris barbara
Perdix perdix italica
Perdix perdix hispaniensis

GRUIFORMES

Turnicidae

Turnix sylvatica

Gruidae

Grus grus

Rallidae

Porzana porzana

Porzana parva

Porzana pusilla

Crex crex

Porphyrio porphyrio

Fulica cristata

Otididae

Tetrax tetrax

Chlamydotis undulata

Otis tarda

CHARADRIIFORMES

Recurvirostridae

Himantopus himantopus

Recurvirostra avosetta

Burhinidae

Burhinus oedicephalus

Glareolidae

Cursorius cursor

Glareola pratincola

Charadriidae

Charadrius alexandrinus

Charadrius morinellus (Eudromias morinellus)

Pluvialis apricaria

Hoplopterus spinosus

Scolopacidae

Calidris alpina schinzii

Philomachus pugnax

Gallinago media

Limosa lapponica

Numenius tenuirostris

Tringa glareola

Xenus cinereus (Tringa cinerea)

Phalaropus lobatus

Laridae

Larus melanocephalus

Larus genei

Larus audouinii

Larus minutus

1991-11

Nature Protection

Sternidae

Gelochelidon nilotica (Sterna nilotica)
Sterna caspia
Sterna sandvicensis
Sterna dougallii
Sterna hirundo
Sterna paradisaea
Sterna albifrons
Chlidonias hybridus
Chlidonias niger

Alcidae

Uria aalge ibericus

PTEROCLIFORMES

Pteroclididae

Pterocles orientalis
Pterocles alchata

COLUMBIFORMES

Columbidae

Columba palumbus azorica
Columba trocaz
Columba bollii
Columba junoniae

STRIGIFORMES

Strigidae

Bubo bubo
Nyctea scandiaca
Surnia ulula
Glaucidium passerinum
Strix nebulosa
Strix uralensis
Asio flammeus
Aegolius funereus

CAPRIMULGIFORMES

Caprimulgidae

Caprimulgus europaeus

APODIFORMES

Apodidae

Apus caffer

CORACIIFORMES

Alcedinidae

Alcedo atthis

Coraciidae

Coracias garrulus

PICIFORMES

Picidae

*Picus canus**Dryocopus martius**Dendrocopos major canariensis**Dendrocopos major thanneri**Dendrocopos syriacus**Dendrocopos medius**Dendrocopos leucotos**Picoides tridactylus*

PASSERIFORMES

Alaudidae

*Chersophilus duponti**Melanocorypha calandra**Calandrella brachydactyla**Galerida theklae**Lullula arborea*

Motacillidae

Anthus campestris

Troglodytidae

Troglodytes troglodytes fridariensis

Muscicapidae (Turdinae)

*Luscinia svecica**Saxicola dacotiae**Oenanthe leucura**Oenanthe cypriaca**Oenanthe pleschanka*

Muscicapidae (Sylviinae)

Acrocephalus melanopogon

1991-11

Nature Protection

Acrocephalus paludicola
Hippolais olivetorum
Sylvia sarda
Sylvia undata
Sylvia melanothorax
Sylvia rueppelli
Sylvia nisoria

Muscicapidae (Muscicapinae)

Ficedula parva
Ficedula semitorquata
Ficedula albicollis

Paridae

Parus ater cypriotes

Sittidae

Sitta krueperi
Sitta whiteheadi

Certhiidae

Certhia brachydactyla dorotheae

Laniidae

Lanius collurio
Lanius minor
Lanius nubicus

Corvidae

Pyrrhocorax pyrrhocorax

Fringillidae (Fringillinae)

Fringilla coelebs ombriosa
Fringilla teydea

Fringillidae (Carduelinae)

Loxia scotica
Bucanetes githagineus
Pyrrhula murina (Pyrrhula pyrrhula murina)

Emberizidae (Emberizinae)

Emberiza cineracea
Emberiza hortulana
Emberiza caesia

ANNEX II

PART A

ANSERIFORMES

Anatidae

Anser fabalis
Anser anser
Branta canadensis
Anas penelope
Anas strepera
Anas crecca
Anas platyrhynchos
Anas acuta
Anas querquedula
Anas clypeata
Aythya ferina
Aythya fuligula

GALLIFORMES

Tetraonidae

Lagopus lagopus scoticus et hibernicus
Lagopus mutus

Phasianidae

Alectoris graeca
Alectoris rufa
Perdix perdix
Phasianus colchicus

GRUIFORMES

Rallidae

Fulica atra

CHARADRIIFORMES

Scolopacidae

Lymnocyptes minimus
Gallinago gallinago
Scolopax rusticola

COLUMBIFORMES

Columbidae

Columba livia
Columba palumbus

PART B

ANSERIFORMES

Anatidae

Cygnus olor
Anser brachyrhynchus
Anser albifrons
Branta bernicla
Netta rufina
Aythya marila
Somateria mollissima
Clangula hyemalis
Melanitta nigra
Melanitta fusca
Bucephala clangula
Mergus serrator
Mergus merganser

GALLIFORMES

Meleagridae

Meleagris gallopavo

Tetraonidae

Bonasa bonasia
Lagopus lagopus lagopus
Tetrao tetrax
Tetrao urogallus

Phasianidae

Francolinus francolinus
Alectoris barbara
Alectoris chukar
Coturnix coturnix

GRUIFORMES

Rallidae

Rallus aquaticus
Gallinula chloropus

CHARADRIIFORMES

Haematopodidae

Haematopus ostralegus

Charadriidae

Pluvialis apricaria

Pluvialis squatarola
Vanellus vanellus

Scolopacidae

Calidris canutus
Philomachus pugnax
Limosa limosa
Limosa lapponica
Numenius phaeopus
Numenius arquata
Tringa erythropus
Tringa totanus
Tringa nebularia

Laridae

Larus ridibundus
Larus canus
Larus fuscus
Larus argentatus
Larus cachinnans
Larus marinus

COLUMBIFORMES

Columbidae

Columba oenas
Streptopelia decaocto
Streptopelia turtur

PASSERIFORMES

Alaudidae

Alauda arvensis

Muscicapidae

Turdus merula
Turdus pilaris
Turdus philomelos
Turdus iliacus
Turdus viscivorus

Sturnidae

Sturnus vulgaris

Corvidae

Garrulus glandarius
Pica pica
Corvus monedula

1991-11

Nature Protection

Corvus frugilegus

Corvus corone

	BE	BG	CZ	DK	DE	EE	GR	ES	FR	IE	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK
<i>Cygnus albr</i>					+																+							
<i>Anser brachyrhynchos</i>	+			+						+																		+
<i>Anser albifrons</i>	+	+	+	+	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Boscoro borealis</i>				+	+																							
<i>Nettion rufus</i>									+	+																		
<i>Actitis macular</i>	+			+	+	+	+	+	+												+							+
<i>Scolopax mollissima</i>				+	+			+	+																		+	+
<i>Clangula clangula</i>				+	+			+	+																		+	+
<i>Melanitta nigra</i>				+	+			+	+																		+	+
<i>Melanitta fusca</i>				+	+			+	+																		+	+
<i>Bucconia clangula</i>				+	+	+	+	+	+																		+	+

	BE	BO	CZ	DK	DE	EE	GR	ES	FR	IE	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK
<i>Mergus merismus</i>					+																						+	+
<i>Mergus mergamus</i>					+																						+	+
<i>Bosmina bosmina</i>								+	+					+							+	+	+	+	+	+	+	+
<i>Lepomis gibbosus</i>																											+	+
<i>Tetraodon lineatus</i>	+								+				+	+													+	+
<i>Tetraodon lineatus</i>	+								+				+	+													+	+
<i>Ferocactus wislizeni</i>																												
<i>Eleocharis acicularis</i>									+																			
<i>Eleocharis acicularis</i>	+																											
<i>Carex caryota</i>	+								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Melospiza gallopavo</i>				+	+																						+	

	BE	BG	CZ	DK	DE	EE	GR	ES	FR	IE	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK
<i>Rallus aquaticus</i>									+			+																
<i>Gallinula chloropus</i>	+								+			+																+
<i>Himantopus ornatus</i>									+																			
<i>Phalaropus apricaria</i>	+								+	+																		+
<i>Phalaropus apricaria</i>									+																			+
<i>Tarebia vassilovi</i>	+								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Calidris canutus</i>									+																			
<i>Phalaropus apricaria</i>									+																			
<i>Larus lineatus</i>									+																			
<i>Larus lapponicus</i>									+																			+
<i>Numenius phaeopus</i>									+																			+
<i>Numenius arquata</i>									+	+																		+

1991-11

Nature Protection

	BE	BG	CZ	DK	DE	EE	GR	ES	FR	IE	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK
<i>Tringa erythropus</i>				+					+																			
<i>Tringa totanus</i>				+					+			+																+
<i>Tringa nebularia</i>				+					+																			
<i>Larus ridibundus</i>	+			+	+	+		+									+		+						+		+	
<i>Larus canus</i>				+	+	+																					+	+
<i>Larus fuscus</i>				+	+																							
<i>Larus argentatus</i>	+			+	+	+								+													+	+
<i>Larus coccyzivorus</i>									+								+											
<i>Larus marinus</i>				+	+	+																					+	+
<i>Columba oenas</i>								+	+	+			+										+	+				
<i>Streptopelia decaocto</i>	+	+	+	+	+				+				+				+		+				-	+				
<i>Streptopelia turtur</i>	+							+	+	+		+	+					+	+			+	+					

<i>Alauda arvensis</i>								+	+			+	+																
<i>Turdus merula</i>								+	-			+	+																+
<i>Turdus pilaris</i>								+	+	+	-		+	+						+	+		+	+			+	+	
<i>Turdus philomelos</i>								+	+	-		+	+											+	+				
<i>Turdus thalassus</i>								+	-	-		+	+											+	+				

	BE	BG	CZ	DK	DE	EE	GR	ES	FR	IE	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK
<i>Turdus viscivorus</i>								+	+	+			+										+	-				
<i>Sturnus vulgaris</i>								+	+	-			-				+	+					+	-				
<i>Garrulus glandarius</i>	+			+	+			+	+	+		+	+				+	+					+	+	+	+	+	+
<i>Picus picus</i>	+	+	+	+	+			+	+	+		+	-	+									+	+	+	+	+	+
<i>Corvus corone</i>	+							+	+			-	+															+
<i>Corvus frugilegus</i>	+							+																	+	+	+	+
<i>Corvus corone</i>	+	+	+	+	+	+	+	+	+	+																		+

AT = Österreich, BE = Belgique/België, BG = България, CY = Κύπρος, CZ = Česká republika, DE = Deutschland, DK = Danmark, EE = Eesti, ES = España, FI = Suomi/Finland, FR = France, GR = Ελλάδα, HU = Magyarország, HR = Hrvatska, IE = Ireland, IT = Italia, LT = Lietuva, LU = Luxembourg, LV = Latvija, MT = Malta, NL = Nederland, PL = Polska, PT = Portugal, RO = România, SE = Sverige, SI = Slovenija, SK = Slovensko, UK = United Kingdom.

- = Member States which under Article 7(3) may authorize hunting of the species listed.

ANNEX III

PART A

ANSERIFORMES

Anatidae

Anas platyrhynchos

GALLIFORMES

Tetraonidae

Lagopus lagopus lagopus, scoticus et hibernicus

Phasianidae

Alectoris rufa

Alectoris barbara

Perdix perdix

Phasianus colchicus

COLUMBIFORMES

Columbidae

Columba palumbus

PART B

ANSERIFORMES

Anatidae

Anser albifrons albifrons

Anser anser

Anas penelope

Anas crecca

Anas acuta

Anas clypeata

Aythya ferina

Aythya fuligula

Aythya marila

Somateria mollissima

Melanitta nigra

GALLIFORMES

Tetraonidae

Lagopus mutus

Tetrao tetrax britannicus

Tetrao urogallus

1991-11

Nature Protection

GRUIFORMES

Rallidae

Fulica atra

CHARADRIIFORMES

Charadriidae

Pluvialis apricaria

Scolopacidae

*Lymnocyptes minimus**Gallinago gallinago**Scolopax rusticola.*

ANNEX IV

(a)

- Snares (with the exception of Finland and Sweden for the capture of *Lagopus lagopus lagopus* and *Lagopus mutus* north of latitude 58° N), limes, hooks, live birds which are blind or mutilated used as decoys, tape recorders, electrocuting devices,
- artificial light sources, mirrors, devices for illuminating targets, sighting devices for night shooting comprising an electronic image magnifier or image converter,
- explosives,
- nets, traps, poisoned or anaesthetic bait,
- semi-automatic or automatic weapons with a magazine capable of holding more than two rounds of ammunition;

(b)

- aircraft, motor vehicles,
- boats driven at a speed exceeding five kilometres per hour. On the open sea, Member States may, for safety reasons, authorise the use of motor-boats with a maximum speed of 18 kilometres per hour. Member States shall inform the Commission of any authorisations granted.

ANNEX V

- (a) National lists of species in danger of extinction or particularly endangered species, taking into account their geographical distribution.
- (b) Listing and ecological description of areas particularly important to migratory species on their migratory routes and as wintering and nesting grounds.
- (c) Listing of data on the population levels of migratory species as shown by ringing.
- (d) Assessing the influence of methods of taking wild birds on population levels.
- (e) Developing or refining ecological methods for preventing the type of damage caused by birds.
- (f) Determining the role of certain species as indicators of pollution.
- (g) Studying the adverse effect of chemical pollution on population levels of bird species.

ANNEX VI

PART A

REPEALED DIRECTIVE WITH LIST OF ITS SUCCESSIVE AMENDMENTS

(referred to in Article 18)

Council Directive 79/409/EEC
(OJ L 103, 25.4.1979, p. 1)

1979 Act of Accession, Annex I, point XIII.1.F
(OJ L 291, 19.11.1979, p. 111)

Council Directive 81/854/EEC
(OJ L 319, 7.11.1981, p. 3)

Commission Directive 85/411/EEC
(OJ L 233, 30.8.1985, p. 33)

1985 Act of Accession, Annex I, points X.1.(h) and X.6
(OJ L 302, 15.11.1985, p. 218)

Council Directive 86/122/EEC
(OJ L 100, 16.4.1986, p. 22)

Commission Directive 91/244/EEC
(OJ L 115, 8.5.1991, p. 41)

Council Directive 94/24/EC
(OJ L 164, 30.6.1994, p. 9)

1994 Act of Accession, Annex I, point VIII.E.1

1991-11

Nature Protection

(OJ C 241, 29.8.1994, p. 175)

Commission Directive 97/49/EC
(OJ L 223, 13.8.1997, p. 9)Council Regulation (EC) No 807/2003
(OJ L 122, 16.5.2003, p. 36)

only Annex III, point 29

2003 Act of Accession, Annex II, point 16.C.1
(OJ L 236, 23.9.2003, p. 667)Council Directive 2006/105/EC
(OJ L 363, 20.12.2006, p. 368)only as regards the reference,
in Article 1, to Directive
79/409/EEC and point A.1 of the
AnnexDirective 2008/102/EC of the European
Parliament and of the Council
(OJ L 323, 3.12.2008, p. 31)**PART B****LST OF TIME LIMITS FOR TRANSPOSITION INTO NATIONAL
LAW****(referred to in Article 18)**

Directives	Time limit for transposition
79/409/EEC	7 April 1981
81/854/EEC	-
85/411/EEC	31 July 1986
86/122/EEC	-
91/244/EEC	31 July 1992
94/24/EC	29 September 1995
97/49/EC	30 September 1998
2006/105/EC	1 January 2007
2008/102/EC	-

ANNEX VII

CORRELATION TABLE

Directive 79/409/EEC	This Directive
Article 1(1) and (2)	Article 1(1) and (2)
Article 1(3)	—
Articles 2 to 5	Articles 2 to 5
Article 6(1), (2) and (3)	Article 6(1), (2) and (3)
Article 6(4)	—
Article 7(1), (2) and (3)	Article 7(1), (2) and (3)
Article 7(4), first sentence	Article 7(4), first subparagraph
Article 7(4), second sentence	Article 7(4), second subparagraph
Article 7(4), third sentence	Article 7(4), third subparagraph
Article 7(4), fourth sentence	Article 7(4), fourth subparagraph
Article 8	Article 8
Article 9(1)	Article 9(1)
Article 9(2), introductory wording	Article 9(2), introductory wording
Article 9(2), first indent	Article 9(2), point (a)
Article 9(2), second indent	Article 9(2), point (b)
Article 9(2), third indent	Article 9(2), point (c)
Article 9(2), fourth indent	Article 9(2), point (d)
Article 9(2), fifth indent	Article 9(2), point (e)
Article 9(3)	Article 9(3)
Article 9(4)	Article 9(4)
Article 10(1)	Article 10(1), first sentence
Article 10(2), first sentence	Article 10(1), second sentence
Article 10(2), second sentence	Article 10(2)
Articles 11 to 15	Articles 11 to 15
Article 16(1)	—
Article 17	Article 16
Article 18(1)	—
Article 18(2)	Article 17
—	Article 18
—	Article 19
Article 19	Article 20
Annex I	Annex I
Annex II/1	Annex II, Part A
Annex II/2	Annex II, Part B
Annex III/1	Annex III, Part A
Annex III/2	Annex III, Part B
Annex IV	Annex IV
Annex V	Annex V

1991-11

Nature Protection

—	Annex VI
—	Annex VII

SCHEDULE 9

section 3 (1)(bb)

WILD BIRDS WHICH RE-USE THEIR NESTS

Common Name	Scientific Name
Eagle Owl	<i>Bubo bubo</i>
Lesser Kestrel	<i>Falco naumanni</i>
Shag	<i>Phalacrocorax aristotelis desmarestii</i>

NOTE: The common name or names given in the first column of this Schedule are included by way of guidance only; in the event of any dispute or proceedings, the common name or names shall not be taken into account.

SCHEDULE 10

Sections 24A and 24B

Admission Fees.

1.(1) Subject to subparagraph (5) and paragraph 2, the fee for admission to the Upper Rock Nature Reserve shall be as follows—

- (a) £0.50 for each person entering by foot at Jews' Gate or Willis's Road;
- (b) £10.00 for each person aged 12 years of age and over entering in a private motor vehicle at Jews' Gate or Willis's Road;
- (c) £5.00 for each person aged from 5 to 11 years of age inclusive entering in a private motor vehicle at Jews' Gate or Willis's Road;
- (d) £2.00 for each private motor vehicle;
- (e) £5.00 for each person for entry at Jews' Gate or Willis's Road in a taxi or as part of a tour group with a tour operator.

(2) Subject to section 24A(2), the fee for admission to all the tourist sites within the Upper Rock Nature Reserve shall be as follows—

- (a) £9.50 for each person aged 12 years of age and over who entered the Upper Rock Nature Reserve by foot at Jews' Gate or Willis's Road;

1991-11

Nature Protection

- (b) £4.50 for each child aged from 5 to 11 years of age inclusive who entered the Upper Rock Nature Reserve by foot at Jews' Gate or Willis's Road;
 - (c) £5.50 for each person aged 12 years of age and over for entry from the cable car middle or top stations if the admission ticket is pre-purchased at the cable car bottom station (if not pre-purchased the fee shall be £10.00);
 - (d) £5.00 for each child aged from 5 to 11 years of age inclusive for entry from the cable car middle or top stations.
- (3) The fees in subparagraphs (1) and (2) are cumulative.
- (4) The fees set in subparagraphs (1)(b) and (1)(c) shall be reduced by £1.00 where the person concerned has previously paid £1.00 for entry to the 100 Ton Gun.
- 2.(1) A person holding a valid Gibraltar identity card relating to that person may enter the Upper Rock Nature Reserve and all tourist sites within the Upper Rock Nature Reserve without paying a fee on production of that card.
- (2) Gibraltar registered vehicles shall be exempted from payment of the fee in paragraph 1(1)(d).
- (3) A child aged under 5 years of age may enter the Upper Rock Nature Reserve and all tourist sites the Upper Rock Nature Reserve without paying a fee.
- (4) Passengers in a taxi engaged for a city service journey shall be exempted from payment of the fee in paragraph 1(1)(e) and shall for the purposes of paragraph 1(2) be deemed to have entered the Upper Rock Nature Reserve by foot at Jew's Gate.
- (5) In subparagraph (4) "city service journey" means a one-way fare which is either—
- (a) to or from a specific residence in a nature conservation area for a resident or visitor to that residence, or
 - (b) in respect of a public or private function occurring in a nature conservation area which is not part of the general tourist attraction of the Upper Rock and which does not involve a stop at or a visit to any part of the Upper Rock except where the event is occurring.

Nature Conservation Area (Upper Rock) Designation Order 1993

Nature Protection

1991-11

**NATURE CONSERVATION AREA (UPPER ROCK)
DESIGNATION ORDER 1991**
**Subsidiary
1993/051**

Order made under section 18(1).

**NATURE CONSERVATION AREA (UPPER ROCK)
DESIGNATION ORDER 1993****(LN. 1993/051)****1.4.1993**

Amending enactments	Relevant current provisions	Commencement date
1993/069	<i>Corrigendum</i>	
1997/064	<i>Corrigendum</i>	

After consultation with the Nature Conservancy Council, I have designated with effect from the 1st day of April 1993, that area described in the Schedule to this order as a Nature Conservation Area to be known, as the Upper Rock Nature Reserve.

Legal Notice No. 116 of 1991 is revoked with effect from the 1st day of April 1991.

**NATURE CONSERVATION AREA (UPPER ROCK)
DESIGNATION ORDER 1991
SCHEDULE
NATURE CONSERVATION AREA
UPPER ROCK NATURE RESERVE.**

The Nature Conservation Area to be known as the Upper Rock Nature Reserve shall be all that area contained within the red delineation including the area covered by that line in the map appearing below.



Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations
1993

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

**Subsidiary
1993/052**

Regulations made under section 21 and 24.

**NATURE CONSERVATION AREA (UPPER ROCK
NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

(LN. 1993/052)

1.4.1993

Amending enactments	Relevant current provisions	Commencement date
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ARRANGEMENT OF REGULATIONS.

Regulation

1. Title and commencement.
2. Interpretation and application.
3. Access.
4. Use of vehicles etc.
5. Protection of wild life.
6. Structures.
7. Conduct of research in the Reserve.
8. Nuisances.
9. Wild life wardens.
10. Offences.

1991-11

Nature Protection

**Subsidiary
1993/052**

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

**Subsidiary
1993/052**

Title and commencement.

1. These regulations may be cited as the Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations 1993 and shall come into effect on the 1st day of April 1993.

Interpretation and application.

2.(1) In these regulations, unless the context shall otherwise require,—

“Authority” means the Government or such undertaking as may be appointed by the Government from time to time to be the Authority;

“domestic livestock” means any animal whether kept for commercial purposes or for pleasure which is or may be a source of food and includes poultry;

“flying machine” includes hang gliders, microlites and remote control model flying machines;

“protected plant” means any wild plant other than a plant specified in Schedule 2 of the Nature Protection Act 1991;

“permitted route” means the roads specified by the Authority by a notice displayed in the Reserve and shall not include paths;

“Reserve” means the Nature Conservation Area designated in the Nature Conservation Area (Upper Rock) Designation Order 1993;

“vehicle” includes pedal cycles and motor cycles.

(2) The provisions of section 2 of the Nature Protection Act 1991 shall be applied to these regulations.

Access.

3.(1) No person shall enter or remain in the Reserve between sunset and sunrise except with the prior written consent of the Authority to do so which consent may specify the part or parts of the Reserve that that person may enter or remain in.

(2) A person to whom written consent has been given in accordance with sub-regulation (1) shall not enter or remain in any part of the Reserve except the part or parts of the Reserve specified in such consent.

1991-11

Nature Protection

Subsidiary
1993/052

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

(3) The Authority may, in its discretion and for the purpose of the good management of the Reserve, close or restrict access to any part of the Reserve or to any road or path in the Reserve.

(4) Where, in exercise of its powers under sub-regulation (3), the Authority has restricted or closed any part of the Reserve or any road or path, the Authority shall place signs indicating—

- (a) the area to which the closure or restriction applies;
- (b) whether or not the area is closed or if access is restricted, the nature of the restriction;
- (c) the period of time for which the closure or restriction is in operation.

(5) Where, in accordance with the provisions of this regulation, the Authority has closed or restricted access to any area, road or path in the Reserve, no person shall enter in that area or onto the road or path or into the road or path in contravention of the restriction, as the case may be.

Use of vehicles etc.

4.(1) No vehicle shall be used in the Reserve except on permitted routes or with the prior written consent of the Authority.

(2) No person shall use a flying machine in the Reserve.

(3) No person shall ride a horse or donkey or any other animal in the reserve, or use any animal-drawn transport.

(4) No vehicle shall be parked in the Reserve except in an area designated for this purpose by the Authority.

Protection of wild life.

5.(1) No person shall, without the prior written consent of the Authority, in the Reserve,—

- (a) hunt, shoot or capture wild life by means except in accordance with a licence granted under the Act;
- (b) take into or use firearms or other weapons, traps or snares;
- (c) enter in to any cave or tunnel used as a roost by bats;

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

**Subsidiary
1993/052**

- (d) uproot or damage trees or plants or pick any protected plant;
- (e) collect or use any wildlife product;
- (f) graze or permit to graze any domestic livestock;
- (g) plant or grow any plant which, in the view of the Authority, is undesirable in the Reserve;
- (h) introduce any animal or plant which is of a kind which is not ordinarily resident or is not a regular visitor to Gibraltar in a wild state or does not grow in the wild in Gibraltar, as the case may be;
- (i) feed any wild animal in the Reserve;
- (j) disturb any wild animal or wild bird in the Reserve;
- (k) climb or use climbing equipment on any cliff in the Reserve.

(2) Subject to the provisions of sub-regulations (3) and (4), no animal other than a wild animal, may be taken into or kept in the Reserve.

(3) Any person resident in the Reserve or having the exclusive use of property in the area of the Reserve, may apply for a licence to take into the Reserve, an animal other than a wild animal.

(4) A dog which is displaying a current licence disc issued in accordance with the Animals and Birds Act may be taken into any part of the Reserve except a part from which by a notice displayed in the Reserve the Authority has excluded—

- (a) dogs; or
- (b) dogs unless kept on lead, unless kept on a lead.

(5) Where a person has made an application under sub-regulation (3), the Authority shall grant the application subject to such conditions as to the safe keeping of the animal as in the view of the Authority are necessary to protect the Reserve, unless the Authority is satisfied that because of the species of the animal or the nature of the particular animal or the circumstances of the location in which it is proposed to keep the animal, it would endanger the wild animals, wild birds or wild plants of the Reserve if the application were to be granted.

Structures.

1991-11

Nature Protection

Subsidiary
1993/052

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

6.(1) No person shall erect whether permanently or temporarily any structure which may obstruct the visibility of the Reserve or change the appearance of the Reserve except with the prior written consent of the Authority and subject to such conditions as the Authority may impose for the protection of the Reserve.

(2) No person shall damage or deface any structure including any natural structure in the Reserve.

Conduct of research in the Reserve.

7. Scientific study may be undertaken in the Reserve—

- (a) with the prior written consent of the Authority and subject to such conditions as the Authority may impose for the purpose of protecting the Reserve;
- (b) subject to the requirement that—
 - (i) the results of such research shall be presented to the Authority;
 - (ii) specimens may only be collected with the prior written consent of the Authority.

Nuisances.

8. No person shall, in the Reserve,—

- (a) deposit litter or waste;
- (b) light a fire except—
 - (i) in an area designated for this purpose by the Authority; and
 - (ii) having previously received the consent in writing of the Authority;
- (c) use a radio, television, cassette or disc player except where such equipment is fitted with headphones and is operated in such a manner as to be inaudible to any person other than the person wearing the headphones;

**NATURE CONSERVATION AREA
(UPPER ROCK NATURE RESERVE) (PROTECTION AND
REGULATION) REGULATIONS, 1993**

**Subsidiary
1993/052**

Provided that a person who is resident in the Reserve or has the exclusive use of property in the area of the Reserve may use such equipment in the property in which he is resident or of which he has exclusive use in such a manner as not to cause disturbance outside the area of that property;

- (d) hawk or sell goods for gain unless having the prior written consent of the Authority and subject to such conditions as may be imposed in that consent;
- (e) camp or set up camping facilities except in an area designated for this purpose by the Authority and with the prior written consent of the Authority.

Wild life wardens.

9.(1) Any person appointed as a Wild Life Warden in accordance with section 21 of the Nature Protection Act 1991, shall carry out such duties in the Reserve as the Authority shall specify and shall have the power, in the Reserve, to stop any person who, it appears to the wild life warden, has failed to comply with the requirements of these regulations and require that person to give to the warden details of the person's name and address evidenced by the production of an identity card or passport.

(2) Any wild life warden shall have, in the Reserve, the powers specified in section 16 of the Nature Protection Act 1991.

Offences.

10. Failure to comply with the provisions of these regulations, shall be an offence punishable on summary conviction by a fine at level 3 on the standard scale.

Nature Conservation (Designation of Gibraltar Nature Reserve) Order 2013

Subsidiary Legislation made under s. 18.

**NATURE CONSERVATION (DESIGNATION OF
GIBRALTAR NATURE RESERVE) ORDER 2013**

(LN. 2013/147)

Commencement **31.10.2013**

Amending
enactments

Relevant current
provisions

Commencement
date

In exercise of the powers conferred upon it by section 18 of the Nature Protection Act 1991, and after consulting the Nature Conservancy Council, the Government has made the following Order—

Title and commencement.

1. This Order may be cited as the Nature Conservation (Designation of Gibraltar Nature Reserve) Order 2013 and comes into operation on the day of publication.

Designation of nature reserve.

2. The area shaded in green in the plan set out in the Schedule is designated as the Gibraltar Nature Reserve.

Revocation.

3. The Nature Conservation Area (Extension of the Upper Rock) Designation Order 2011 is revoked, subject to regulation 4.

Savings.

4. A person's liability for any act done within the area designated under the Nature Conservation Area (Extension of the Upper Rock) Designation Order 2011 shall not be affected by the revocation under paragraph 3 if the act took place within the area that is also designated by this Order.

1991-11

Nature Protection

NATURE CONSERVATION (DESIGNATION OF GIBRALTAR NATURE RESERVE) ORDER 2013

Subsidiary 2013/147

SCHEDULE

Gibraltar Nature Reserve



Gibraltar Neanderthals

Nature Protection Act (Powers and Duties of Wildlife Wardens) Regulations 2013

Subsidiary Legislation made under s. 21(2) and after consultation with the Nature Conservancy Council, 24(e) of the Nature Protection Act 1991.

NATURE PROTECTION ACT (POWERS AND DUTIES OF WILDLIFE WARDENS) REGULATIONS 2013

(LN. 2013/183)

Commencement **12.12.2013**

Amending enactments	Relevant current provisions	Commencement date
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In exercise of the powers conferred upon it by sections 21(2) and after consultation with the Nature Conservancy Council, 24(e) of the Nature Protection Act 1991, the Government has made the following Regulations—

Title and commencement.

1. These Regulations may be cited as the Nature Protection Act (Powers and Duties of Wildlife Wardens) Regulations 2013 and come into operation on the day of publication.

Interpretation.

2. In these Regulations a reference to a numbered section is to the section of the Nature Protection Act 1991 (“the Act”).

Powers and duties of Wildlife Wardens.

3.(1) Without prejudice to the generality of the provisions of section 16, regulation 9 of the Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations, 1993 and any other subsidiary legislation, any person appointed as a Wildlife Warden in accordance with section 21 shall have such powers and shall carry out such duties as the Authority shall specify—

- (a) to monitor the application and implementation of the Act and any subsidiary legislation thereto and report any breaches therein;

**Subsidiary
2013/183**

- (b) to stop and question any person whom the Wildlife Warden suspects is or appears to be involved in any activity regulated or prohibited under the Act and any subsidiary legislation thereto and require that person to give the warden details of the person's name and address evidenced by the production of an identity card or passport;
- (c) to ensure compliance with conditions stipulated in any license or permit issued under the Act and any subsidiary legislation thereto is adhered to and that no unlicensed activities are carried out;
- (d) to report and record any activity regulated or prohibited under the Act and any subsidiary legislation thereto;
- (e) to monitor any activity permitted under the Act and otherwise carried out in areas protected under the Act;
- (f) to provide information and interpretation to the public and others on matters related to the natural environment; and
- (g) such other related or similar functions as the Authority may direct.

Nature Protection (Nature Conservancy Council) Regulations 2013

**NATURE PROTECTION (NATURE CONSERVANCY COUNCIL)
REGULATIONS 2013**

**Subsidiary
2013/098**

Subsidiary Legislation made under s. 20.

**NATURE PROTECTION (NATURE CONSERVANCY
COUNCIL) REGULATIONS 2013**

(LN. 2013/098)

Commencement **4.7.2013**

Amending enactments	Relevant current provisions	Commencement date
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ARRANGEMENT OF REGULATIONS

Regulation

1. Title and commencement.
2. Interpretation.
3. Nature Conservancy Council.
5. Duties of the Nature Conservancy Council.

1991-11

Nature Protection

**Subsidiary
2013/098**

**NATURE PROTECTION (NATURE CONSERVANCY COUNCIL)
REGULATIONS 2013**

**NATURE PROTECTION (NATURE CONSERVANCY COUNCIL)
REGULATIONS 2013****Subsidiary
2013/098**

In exercise of his powers under section 20 of the Nature Protection Act 1991, and all other enabling powers, the Minister has made the following Regulations—

Title and commencement.

1. These Regulations may be cited as the Nature Protection (Nature Conservancy Council) Regulations 2013 and come into operation on the day of publication.

Interpretation.

2. In these Regulations—

“Minister” means the Minister with responsibility for the Environment;

“Nature Conservancy Council” means the scientific authority established by these Regulations.

Nature Conservancy Council.

3.(1) There is hereby established a scientific authority which for the purposes of the Act shall be known as the Nature Conservancy Council.

(2) The Nature Conservancy Council shall be comprised of such suitably qualified or experienced persons, not in Government service, to be members, being not less than five in number, as the Minister may notify in the Gazette, one of whom shall be appointed to be the Secretary.

(3) Unless otherwise stated in the notice of appointment a member shall hold office for three years.

(4) The Minister may at any time and for any purpose revoke any appointment and any such revocation shall be notified in the Gazette.

Meetings.

4.(1) Three members shall constitute a quorum at any meeting of the Nature Conservancy Council.

(2) All decisions of the Nature Conservancy Council shall be decided by a majority vote of the persons present at any meeting.

(3) The Nature Conservancy Council shall regulate its own procedures to the extent that those do not conflict with any provisions of these Regulations.

1991-11

Nature Protection

Subsidiary
2013/098

**NATURE PROTECTION (NATURE CONSERVANCY COUNCIL)
REGULATIONS 2013**

(4) The Nature Conservancy Council shall meet at least twice in any calendar year.

Duties of the Nature Conservancy Council.

5.(1) It shall be the duty of the Nature Conservancy Council to—

- (a) advise the Government on all matters relating to nature conservation in Gibraltar, including the administration of habitats and other natural areas (including marine habitats and other marine areas);
- (b) advise the Government in connection with the issue of any permit or licence where the issue of that permit or licence may affect on the conservation status or management of the terrestrial or marine environment;

and to perform such other duty as the Government may by notice in writing require.

(2) The Nature Conservancy Council shall undertake such duties as may be provided for in any other enactment.

Environmental Protection (Trees) Act 2014

Environmental Protection (Trees)

2014-01**ENVIRONMENTAL PROTECTION (TREES) ACT 2014****Principal Act**

Act. No. 2014-01	<i>Commencement</i>	27.2.2014
	<i>Assent</i>	24.2.2014

Amending enactments	Relevant current provisions	Commencement date
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Environmental Protection (Trees)

ARRANGEMENT OF SECTIONS

Section

PART I PRELIMINARY

1. Title and commencement.
2. Interpretation.
3. Application of this Act.

PART II TREE PRESERVATION ORDERS

4. Tree Preservation Order.
5. Procedure after making a Tree Preservation Order.
6. Variation or revocation of a Tree Preservation Order.
7. Notice to remedy dangerous or infested tree.
8. Prohibited activity.
9. Application for consent in respect of a Tree Preservation Order.
10. Determination of applications for consent made under section 9.
11. Register.

PART III TREES NOT SUBJECT TO PART II

12. Application of Part III.
13. Prohibition.
14. Application for consent under Part III.
15. Determination of applications for consent under section 14.

PART IV EXCEPTIONS, ETC.

16. Exceptions.
17. Replacement of trees.
18. Appeals.
19. Right to enter any land.
20. Electronic communications.
21. Power to make Regulations.
22. Amendment of Schedule.
23. Governor's constitutional responsibilities.
24. Amendment of the Town Planning Act 1999.
25. Transitional provision.

SCHEDULE

Environmental Protection (Trees)

AN ACT TO PROVIDE FOR THE PRESERVATION AND PROTECTION OF TREES; AND FOR CONNECTED PURPOSES.

PART I PRELIMINARY

Title and commencement.

1. This Act may be cited as the Environmental Protection (Trees) Act 2014 and comes into operation on the day of publication.

Interpretation.

2. In this Act, unless the context otherwise requires—

“Commission” means the Development and Planning Commission established under section 3 of the Town Planning Act 1999;

“land affected by the Order” means the land on which the tree, group of trees or woodland to which a Tree Preservation Order relates is situated;

“Minister” means the Minister with responsibility for the Environment;

“Tribunal” means the Development Appeals Tribunal appointed under section 24(2) of the Town Planning Act 1999.

Application of this Act.

3.(1) Subject to the provisions of this section, this Act binds the Crown.

(2) No act or omission done or suffered by or on behalf of the Crown constitutes an offence under this Act.

(3) The Government may certify that in the interests of the security of Gibraltar the right of entry under section 19 shall not be exercisable in relation to the premises specified in the certificate.

PART II TREE PRESERVATION ORDERS

Tree Preservation Order.

4.(1) The Commission may make an Order for the preservation of any tree, group of trees or woodland.

(2) An Order made under subsection (1) shall be known as a Tree Preservation Order.

(3) A Tree Preservation Order shall—

- (a) specify the tree, group of trees or woodland to which it relates;
- (b) if the Order relates to a group of trees, specify the number of trees of each species in the group; and
- (c) indicate the position of the tree, group of trees or woodland by reference to a map and its geographical coordinates.

Procedure after making a Tree Preservation Order.

5.(1) Subject to subsection (2), the Commission shall after making a Tree Preservation Order serve a copy of it on the owner and the occupier of the land affected by the Order.

(2) Where the Order relates to a tree, group of trees or woodland situated on land owned by the Government, a copy of the Order shall be served on the relevant government department, agency or authority responsible for that land.

(3) The Commission shall make a copy of the Order available for public inspection at the office of the Town Planner and may also make the Order available by electronic means.

Variation or revocation of a Tree Preservation Order.

6.(1) The Commission may vary or revoke a Tree Preservation Order to such an extent as it considers necessary.

(2) Where the Commission varies or revokes a Tree Preservation Order it shall endorse the original Order with a statement to the effect that the Order has been varied or revoked and specifying the date.

(3) Where the Commission varies a Tree Preservation Order it shall serve—

- (a) a copy of the Order as varied; and
- (b) a statement explaining the effect of the Order as varied,

on the owner and the occupier of the land affected by the Order.

(4) Where the Commission revokes a Tree Preservation Order it shall notify the owner and the occupier of the land affected by the Order that the Order has been revoked.

Environmental Protection (Trees)

Notice to remedy dangerous or infested tree.

7.(1) If it appears to the Commission that a tree, group of trees or woodland that is subject to a Tree Preservation Order—

- (a) is infected with any infestation or disease; or
- (b) is in such a condition that it is likely to cause danger to any person or damage to any property,

it may serve a notice on the owner of the land affected by the Order requiring such steps to be taken, as may be specified in the notice, to prevent, cure or control the infestation or disease, or remedy the condition, of the tree, group of trees or woodland.

(2) A notice under subsection (1) shall specify the period, not being less than 28 days from the date of service of the notice, by which the specified steps are required to be taken.

(3) A person who fails to comply with a notice served under subsection (1) commits an offence and is liable on summary conviction to a fine at level 3 on the standard scale.

Prohibited activity.

8.(1) A person shall not prune, cut down, top, lop, uproot, wilfully damage or wilfully destroy a tree that is subject to a Tree Preservation Order without the written consent of the Commission and, where consent is given subject to conditions, in accordance with those conditions.

(2) A person who contravenes subsection (1) commits an offence and is liable on summary conviction to a fine at level 5 on the standard scale.

Application for consent in respect of a Tree Preservation Order.

9.(1) An application for consent to prune, cut down, top, lop or uproot a tree that is subject to a Tree Preservation Order shall be made to the Commission.

(2) An application under this section shall—

- (a) be made in writing on a form provided by the Commission for that purpose;
- (b) include the particulars specified in the form;
- (c) be accompanied by—

- (i) a plan which identifies the tree, group of trees or woodland to which the application relates;
- (ii) such information as is necessary to specify the work for which consent is sought;
- (iii) a statement of the applicant's reasons for making the application; and
- (iv) appropriate evidence describing any structural damage to property or in relation to tree health or safety, as applicable.

Determination of applications for consent made under section 9.

10.(1) An application for consent made under section 9 shall be determined by the Commission who may—

- (a) grant consent either unconditionally or subject to conditions; or
- (b) refuse consent.

(2) Without prejudice to the generality of subsection (1)(a), the conditions subject to which consent may be granted may include conditions with respect to—

- (a) the planting of one or more trees, including conditions about how, where or when planting is to be done;
- (b) conditions requiring things to be done, or installed, for the protection of any trees planted in pursuance of conditions under paragraph (a);
- (c) requiring approvals to be obtained from the Commission;
- (d) specifying the standard to which the works for which consent has been given must be carried out;
- (e) limiting the duration of consent.

(3) The Commission shall notify the applicant of its decision by notice in writing.

(4) Where consent is granted under subsection (1)(a) it shall be valid for a period of two years beginning with the date of its grant.

Environmental Protection (Trees)

(5) A grant of consent under subsection (1)(a) shall (except so far as the consent otherwise provides) enure for the benefit of the land to which the Tree Preservation Order relates and of all persons for the time being interested in it.

Register.

11.(1) The Commission shall maintain a register containing the following information—

- (a) the Tree Preservation Orders made by the Commission;
- (b) details of any application for consent made under section 9; and
- (c) where a decision has been taken with respect to an application, the Commission's decision in relation to the application, including any conditions subject to which consent has been granted.

(2) The register maintained under this section shall be available for inspection by the public at all reasonable hours and may also be made available electronically.

PART III TREES NOT SUBJECT TO PART II

Application of Part III.

12. This Part applies to a tree that is not the subject of a Tree Preservation Order under Part II.

Prohibition.

13.(1) A person shall not cut down or uproot a tree to which this Part applies unless that person has—

- (a) the written consent of the Commission and, where consent is given subject to conditions, in accordance with those conditions; or
- (b) applied for consent under section 14 and has not received notice—
 - (i) of the Commission's decision; or
 - (ii) that his application is being considered,

within 28 days beginning with the day the application for consent is received by the Commission.

(2) A person who contravenes subsection (1) commits an offence and is liable on summary conviction to a fine at level 4 on the standard scale.

Application for consent under Part III.

14.(1) An application for consent to cut down or uproot a tree to which this Part applies shall be made to the Commission.

(2) An application under this section shall—

- (a) be made in writing on a form provided by the Commission for that purpose;
- (b) include the particulars specified in the form;
- (c) be accompanied by—
 - (i) a plan which identifies the tree to which the application relates;
 - (ii) such information as is necessary to specify the work for which consent is sought;
 - (iii) a statement of the applicant's reasons for making the application; and
 - (iv) appropriate evidence describing any structural damage to property or in relation to tree health or safety, as applicable.

Determination of applications for consent under section 14.

15.(1) An application for consent made under section 14 shall be determined by the Commission who may—

- (a) grant consent either unconditionally or subject to conditions; or
- (b) refuse consent.

(2) Without prejudice to the generality of subsection (1)(a), the conditions subject to which consent may be granted may include conditions with respect to—

- (a) the planting of one or more trees, including conditions about how, where or when planting is to be done;

Environmental Protection (Trees)

(b) limiting the duration of the consent.

(3) The Commission shall notify the applicant of its decision by notice in writing.

(4) Where consent is granted under subsection (1)(a) it shall be valid for a period of one year beginning with the date of its grant.

(5) A grant of consent under subsection (1)(a) shall (except so far as the consent otherwise provides) enure for the benefit of the land to which the consent relates and of all persons for the time being interested in it.

PART IV EXCEPTIONS, ETC.

Exceptions.

16.(1) Sections 8 and 13 shall not apply—

- (a) to the cutting down, topping, lopping or uprooting of a tree—
 - (i) whose diameter does not exceed 75 millimetres;
 - (ii) which is dead;
 - (iii) where that work is urgently necessary to remove an immediate risk of serious harm;
 - (iv) where that work is urgently necessary for security purposes;
 - (v) so far as work is necessary to implement full planning permission granted under the Town Planning Act 1999;
- (b) to the removal of dead branches from a dead tree;
- (c) to the cutting down or lopping of a tree in compliance with a notice served under—
 - (i) section 255 of the Public Health Act; or
 - (ii) paragraph 5 of Schedule 3 to the Gibraltar Electricity Authority Act 2003;
- (d) to the cutting down of a tree in accordance with a permit issued under section 49 of the Gibraltar Heritage Trust Act 1989;

- (e) to the cutting down or uprooting of a tree in compliance with any notice or permission issued by or under, or any obligation imposed by, any other legislation;
 - (f) in circumstances where section 359 of the Crimes Act 2011 applies; or
 - (g) to the cutting down, topping, lopping or uprooting of a tree, group of trees or woodland situated on the land specified in the Schedule and carried out in accordance with the written authorisation of the Government.
- (2) Where subparagraph (ii) or (iii) of subsection (1)(a) applies, notice in writing shall be given to the Commission—
- (a) in the case of works urgently necessary to remove an immediate risk of serious harm, as soon as practicable after the works become necessary;
 - (b) in any other case at least five working days prior to the date on which the works are to be commenced.
- (3) The notice referred to in subsection (2)(a) shall be accompanied by appropriate evidence in order to prove, to the satisfaction of the Commission, that the works were urgently necessary to remove an immediate risk of serious harm.
- (4) For the purpose of subsection (1)(a)(i)—
- (a) where a tree has more than one stem at a point 1.5 metres above the natural ground level its diameter shall be treated as exceeding 75 millimetres if any stem when measured over its bark at that point exceeds 75 millimetres; and
 - (b) in any other case, the diameter of a tree shall be ascertained by measurement over the bark of the tree at a point 1.5 metres above the natural ground level.

Replacement of trees.

- 17.(1) If any tree is cut down or uprooted—
- (a) in contravention of section 8 or 13; or
 - (b) in any case where subparagraph (ii) or (iii) of section 16(1)(a) applies,

Environmental Protection (Trees)

the Commission may serve a notice on the owner of the land to plant one or more trees of an appropriate size and species within such period as may be specified in the notice.

(2) For the purposes of subsection (1), the Commission may require the owner of the land to plant one or more trees—

- (a) at the same place, or on or near the land, on which the tree cut down or uprooted stood; or
- (b) on such other land and in such places as may be agreed between the Commission and the owner of the land.

(3) A person who fails to comply with a notice served under subsection (1) commits an offence and is liable on summary conviction to a fine at level 3 on the standard scale.

(4) A court passing sentence under subsection (3) may, whether it imposes a penalty or not, make an order that the defendant comply with the notice issued under subsection (1).

Appeals.

18.(1) Where the Commission refuses an application for consent made under section 9 or 14, or grants it subject to conditions, the applicant may by notice in writing appeal to the Tribunal within 28 days of the date the applicant is notified of the Commission's decision.

(2) A person who has made an application under section 9 or 14 may also appeal to the Tribunal if the Commission have not notified that person of the Commission's decision at the end of the period of 8 weeks beginning with the date on which application was received by the Commission.

(3) Where subsection (2) applies, for the purposes of this section the application shall be treated as if—

- (a) it had been refused by the Commission; and
- (b) notification of the Commission's decision had been received by the applicant at the end of the period of 8 weeks beginning with the date the application was received by the Commission.

(4) Where the Commission makes a Tree Preservation Order under section 4, the owner or occupier of the land affected by the Order may appeal to the Tribunal against the Order within 28 days of making the Order.

(5) Where the Commission has served a notice under section 7, the owner of the land to which the notice relates may appeal to the Tribunal against the notice within 14 days of the receipt of the notice.

(6) An appeal under this section shall—

- (a) be made in the form provided by the Commission; and
- (b) state clearly and precisely the full reasons for the appeal.

(7) On an appeal to the Tribunal made under subsection (1) or (2), the Tribunal may—

- (a) confirm or vary the decision of the Commission in whole or in part;
- (b) where consent has been refused by the Commission, direct that consent be granted subject to such conditions, if any, as the Tribunal may specify; or
- (c) direct that any condition subject to which consent has been granted by the Commission be deleted, modified or replaced by such conditions as the Tribunal may specify.

(8) On an appeal to the Tribunal made under subsection (4), the Tribunal may—

- (a) confirm the decision of the Commission to make a Tree Preservation Order; or
- (b) vary or revoke the Tree Preservation Order.

(9) On an appeal to the Tribunal made under subsection (5), the Tribunal may—

- (a) confirm or vary the requirements of the notice; or
- (b) revoke the notice.

(10) On an appeal under this section, the Tribunal shall, if either the appellant or the Commission so desire, give each an opportunity of appearing before and being heard by the Tribunal.

(11) The decision of the Tribunal on any appeal shall be final, and it shall be the duty of the Commission and the appellant to comply with any directions of the Tribunal given in respect of the appeal.

Right to enter any land.

Environmental Protection (Trees)

19.(1) A person duly authorised in writing by the Commission may enter any land for the purpose of—

- (a) surveying it in connection with making, varying or revoking a Tree Preservation Order, including making an assessment of a tree, group of trees or woodland;
- (b) ascertaining whether an offence under section 8 or 13 has been committed; or
- (c) determining whether a notice under section 7 or 17 should be served.

(2) Any right to enter by virtue of this section shall be exercised after giving at least three days' notice in writing to the owner and the occupier of the relevant land.

(3) A person who wilfully obstructs a person acting in the exercise of a right of entry under this section commits an offence and is liable on summary conviction to a fine at level 3 on the standard scale.

Electronic communications.

20.(1) An application, notice or other document that is required or permitted to be made or given under this Act to the Commission or the Tribunal may be made or given by electronic communication in the form approved by the Commission.

(2) Where an application is made under this Act by electronic communication,—

- (a) any communication between the Commission and the applicant; or
- (b) any notice or other document required or permitted to be given by the Commission to the applicant,

may be made or given by electronic communication and the applicant shall be taken to have agreed to the use of such communication for the purposes of that application.

(3) Where an appeal is made under this Act by electronic communication,—

- (a) any communication between the Tribunal and the applicant; or

- (b) any notice or other document required or permitted to be given by the Tribunal to the appellant,

may be made or given by electronic communication and the appellant shall be taken to have agreed to the use of such communication for the purposes of that appeal.

(4) Any application, notice, or other document made or submitted by electronic communication must be—

- (a) capable of being accessed by the recipient;
- (b) legible in all material respects; and
- (c) sufficiently permanent to be used for subsequent reference.

(5) In relation to the use of electronic communications for any purpose which in accordance with this section is capable of being carried out electronically any references in this Act to a map, plan, drawing or any other document includes a reference to such document, or a copy of it, in electronic form.

(6) In this section, “electronic communication” means a communication transmitted (whether from one person to another, from one device to another or from a person to a device or vice versa)—

- (a) by means of an electronic communications network; or
- (b) by other means but while in electronic form.

Power to make Regulations.

21. The Minister may make such Regulations as may be necessary for carrying out the purposes of this Act and in particular—

- (a) the form and manner of making an application under this Act and the information required to be submitted in connection with the application;
- (b) for the purpose of further authorising or facilitating the use of electronic communications or electronic storage for anything required to be done, or which may be done, under this Act;
- (c) the procedure to be followed in the making and consideration of the application;
- (d) prescribing fees to be paid on making such an application;

Environmental Protection (Trees)

- (e) for regulating appeals under section 18;
- (f) exempting any tree, group of trees, woodland, or any area of Gibraltar, from the application of this Act.

Amendment of Schedule.

22. The Minister may by Order amend or vary the Schedule.

Governor's constitutional responsibilities.

23.(1) Nothing in this Act or in any regulations made under this Act shall derogate from the responsibility of the Governor under the Constitution for defence, internal security or any other matter for which the Governor may have responsibility under the Constitution.

(2) The Government shall consult the Governor in relation to any matter for which the Governor has responsibility under the Constitution.

Amendment of the Town Planning Act 1999.

24. The Town Planning Act 1999 is amended by repealing section 38.

Transitional provision.

25. A Tree Preservation Order made under section 38 of the Town Planning Act 1999 shall have effect as if it was made under this Act.

SCHEDULE

Section 16(1)(g)

1. The area designated as a nature conservation area under section 18(1) of the Nature Protection Act 1991.
2. The public gardens known as the Alameda Gardens.

European Habitat Directive of 21 May 1992

II

(Acts whose publication is not obligatory)

COUNCIL

COUNCIL DIRECTIVE 92/43/EEC

of 21 May 1992

on the conservation of natural habitats and of wild fauna and flora

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130s thereof,

Having regard to the proposal from the Commission ⁽¹⁾,

Having regard to the opinion of the European Parliament ⁽²⁾,

Having regard to the opinion of the Economic and Social Committee ⁽³⁾,

Whereas the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora, are an essential objective of general interest pursued by the Community, as stated in Article 130r of the Treaty;

Whereas the European Community policy and action programme on the environment (1987 to 1992) ⁽⁴⁾ makes provision for measures regarding the conservation of nature and natural resources;

Whereas, the main aim of this Directive being to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, this Directive makes a contribution to the general objective of sustainable development; whereas the maintenance of such biodiversity may in certain cases require the maintenance, or indeed the encouragement, of human activities;

Whereas, in the European territory of the Member States, natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened; whereas given that the threatened habitats and species form part of the Community's natural heritage and the threats to them are often of a transboundary nature, it is necessary to take measures at Community level in order to conserve them;

Whereas, in view of the threats to certain types of natural habitat and certain species, it is necessary to define them as having priority in order to favour the early implementation of measures to conserve them;

Whereas, in order to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status, it is necessary to designate special areas of conservation in order to create a coherent European ecological network according to a specified timetable;

Whereas all the areas designated, including those classified now or in the future as special protection areas pursuant to Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds ⁽⁵⁾, will have to be incorporated into the coherent European ecological network;

Whereas it is appropriate, in each area designated, to implement the necessary measures having regard to the conservation objectives pursued;

Whereas sites eligible for designation as special areas of conservation are proposed by the Member States but whereas

⁽¹⁾ OJ No C 247, 21. 9. 1988, p. 3 and OJ No C 195, 3. 8. 1990, p. 1.

⁽²⁾ OJ No C 75, 20. 3. 1991, p. 12.

⁽³⁾ OJ No C 31, 6. 2. 1991, p. 25.

⁽⁴⁾ OJ No C 328, 7. 12. 1987, p. 1.

⁽⁵⁾ OJ No L 103, 25. 4. 1979, p. 1. Directive as last amended by Directive 91/244/ECC (OJ No L 115, 8. 5. 1991, p. 41).

a procedure must nevertheless be laid down to allow the designation in exceptional cases of a site which has not been proposed by a Member State but which the Community considers essential for either the maintenance or the survival of a priority natural habitat type or a priority species;

Whereas an appropriate assessment must be made of any plan or programme likely to have a significant effect on the conservation objectives of a site which has been designated or is designated in future;

Whereas it is recognized that the adoption of measures intended to promote the conservation of priority natural habitats and priority species of Community interest is a common responsibility of all Member States; whereas this may, however, impose an excessive financial burden on certain Member States given, on the one hand, the uneven distribution of such habitats and species throughout the Community and, on the other hand, the fact that the 'polluter pays' principle can have only limited application in the special case of nature conservation;

Whereas it is therefore agreed that, in this exceptional case, a contribution by means of Community co-financing should be provided for within the limits of the resources made available under the Community's decisions;

Whereas land-use planning and development policies should encourage the management of features of the landscape which are of major importance for wild fauna and flora;

Whereas a system should be set up for surveillance of the conservation status of the natural habitats and species covered by this Directive;

Whereas a general system of protection is required for certain species of flora and fauna to complement Directive 79/409/EEC; whereas provision should be made for management measures for certain species, if their conservation status so warrants, including the prohibition of certain means of capture or killing, whilst providing for the possibility of derogations on certain conditions;

Whereas, with the aim of ensuring that the implementation of this Directive is monitored, the Commission will periodically prepare a composite report based, *inter alia*, on the information sent to it by the Member States regarding the application of national provisions adopted under this Directive;

Whereas the improvement of scientific and technical knowledge is essential for the implementation of this Directive; whereas it is consequently appropriate to encourage the necessary research and scientific work;

Whereas technical and scientific progress mean that it must be possible to adapt the Annexes; whereas a procedure should be established whereby the Council can amend the Annexes;

Whereas a regulatory committee should be set up to assist the Commission in the implementation of this Directive and in

particular when decisions on Community co-financing are taken;

Whereas provision should be made for supplementary measures governing the reintroduction of certain native species of fauna and flora and the possible introduction of non-native species;

Whereas education and general information relating to the objectives of this Directive are essential for ensuring its effective implementation,

HAS ADOPTED THIS DIRECTIVE:

Definitions

Article 1

For the purpose of this Directive:

- (a) *conservation* means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status as defined in (e) and (i);
- (b) *natural habitats* means terrestrial or aquatic areas distinguished by geographic, abiotic and biotic features, whether entirely natural or semi-natural;
- (c) *natural habitat types of Community interest* means those which, within the territory referred to in Article 2:
 - (i) are in danger of disappearance in their natural range;
 - or
 - (ii) have a small natural range following their regression or by reason of their intrinsically restricted area;
 - or
 - (iii) present outstanding examples of typical characteristics of one or more of the five following biogeographical regions: Alpine, Atlantic, Continental, Macaronesian and Mediterranean.

Such habitat types are listed or may be listed in Annex I;

- (d) *priority natural habitat types* means natural habitat types in danger of disappearance, which are present on the territory referred to in Article 2 and for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory referred to in Article 2; these priority natural habitat types are indicated by an asterisk (*) in Annex I;
- (e) *conservation status of a natural habitat* means the sum of the influences acting on a natural habitat and its

typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservative status of a natural habitat will be taken as 'favourable' when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined in (i);

(f) *habitat of a species* means an environment defined by specific abiotic and biotic factors, in which the species lives at any stage of its biological cycle;

(g) *species of Community interest* means species which, within the territory referred to in Article 2, are:

- (i) endangered, except those species whose natural range is marginal in that territory and which are not endangered or vulnerable in the western palearctic region; or
- (ii) vulnerable, i.e. believed likely to move into the endangered category in the near future if the causal factors continue operating; or
- (iii) rare, i.e. with small populations that are not at present endangered or vulnerable, but are at risk. The species are located within restricted geographical areas or are thinly scattered over a more extensive range; or
- (iv) endemic and requiring particular attention by reason of the specific nature of their habitat and/or the potential impact of their exploitation on their habitat and/or the potential impact of their exploitation on their conservation status.

Such species are listed or may be listed in Annex II and/or Annex IV or V;

(h) *priority species* means species referred to in (g) (i) for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory referred to in Article 2; these priority species are indicated by an asterisk (*) in Annex II;

(i) *conservation status of a species* means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;

The *conservation status* will be taken as 'favourable' when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis;

(j) *site* means a geographically defined area whose extent is clearly delineated;

(k) *site of Community importance* means a site which, in the biogeographical region or regions to which it belongs, contributes significantly to the maintenance or restoration at a favourable conservation status of a natural habitat type in Annex I or of a species in Annex II and may also contribute significantly to the coherence of Natura 2000 referred to in Article 3, and/or contributes significantly to the maintenance of biological diversity within the biogeographic region or regions concerned.

For animal species ranging over wide areas, sites of Community importance shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction;

(l) *special area of conservation* means a site of Community importance designated by the Member States through a statutory, administrative and/or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated;

(m) *specimen* means any animal or plant, whether alive or dead, of the species listed in Annex IV and Annex V, any part or derivative thereof, as well as any other goods which appear, from an accompanying document, the packaging or a mark or label, or from any other circumstances, to be parts or derivatives of animals or plants of those species;

(n) *the committee* means the committee set up pursuant to Article 20.

Article 2

1. The aim of this Directive shall be to contribute towards ensuring bio-diversity through the conservation of natural

habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies.

2. Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest.
3. Measures taken pursuant to this Directive shall take account of economic, social and cultural requirements and regional and local characteristics.

Conservation of natural habitats and habitats of species

Article 3

1. A coherent European ecological network of special areas of conservation shall be set up under the title Natura 2000. This network, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range.

The Natura 2000 network shall include the special protection areas classified by the Member States pursuant to Directive 79/409/EEC.

2. Each Member State shall contribute to the creation of Natura 2000 in proportion to the representation within its territory of the natural habitat types and the habitats of species referred to in paragraph 1. To that effect each Member State shall designate, in accordance with Article 4, sites as special areas of conservation taking account of the objectives set out in paragraph 1.
3. Where they consider it necessary, Member States shall endeavour to improve the ecological coherence of Natura 2000 by maintaining, and where appropriate developing, features of the landscape which are of major importance for wild fauna and flora, as referred to in Article 10.

Article 4

1. On the basis of the criteria set out in Annex III (Stage 1) and relevant scientific information, each Member State shall propose a list of sites indicating which natural habitat types in Annex I and which species in Annex II that are native to its territory the sites host. For animal species ranging over wide areas these sites shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction. For aquatic species which range over wide areas, such sites will be

proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction. Where appropriate, Member States shall propose adaptation of the list in the light of the results of the surveillance referred to in Article 11.

The list shall be transmitted to the Commission, within three years of the notification of this Directive, together with information on each site. That information shall include a map of the site; its name, location, extent and the data resulting from application of the criteria specified in Annex III (Stage 1) provided in a format established by the Commission in accordance with the procedure laid down in Article 21.

2. On the basis of the criteria set out in Annex III (Stage 2) and in the framework both of each of the five biogeographical regions referred to in Article 1 (c) (iii) and of the whole of the territory referred to in Article 2 (1), the Commission shall establish, in agreement with each Member State, a draft list of sites of Community importance drawn from the Member States' lists identifying those which lost one or more priority natural habitat types or priority species.

Member States whose sites hosting one or more priority natural habitat types and priority species represent more than 5% of their national territory may, in agreement with the Commission, request that the criteria listed in Annex III (Stage 2) be applied more flexibly in selecting all the sites of Community importance in their territory.

The list of sites selected as sites of Community importance, identifying those which host one or more priority natural habitat types or priority species, shall be adopted by the Commission in accordance with the procedure laid down in Article 21.

3. The list referred to in paragraph 2 shall be established within six years of the notification of this Directive.

4. Once a site of Community importance has been adopted in accordance with the procedure laid down in paragraph 2, the Member State concerned shall designate that site as a special area of conservation as soon as possible and within six years at most, establishing priorities in the light of the importance of the sites for the maintenance or restoration, at a favourable conservation status, of a natural habitat type in Annex I or a species in Annex II and for the coherence of Natura 2000, and in the light of the threats of degradation or destruction to which those sites are exposed.

5. As soon as a site is placed on the list referred to in the third subparagraph of paragraph 2 it shall be subject to Article 6 (2), (3) and (4).

Article 5

1. In exceptional cases where the Commission finds that a national list as referred to in Article 4 (1) fails to mention a site hosting a priority natural habitat type or priority species which, on the basis of relevant and reliable scientific information, it considers to be essential for the maintenance of that priority natural habitat type or for the survival of that priority species, a bilateral consultation procedure shall be initiated between that Member State and the Commission for the purpose of comparing the scientific data used by each.

2. If, on expiry of a consultation period not exceeding six months, the dispute remains unresolved, the Commission shall forward to the Council a proposal relating to the selection of the site as a site of Community importance.

3. The Council, acting unanimously, shall take a decision within three months of the date of referral.

4. During the consultation period and pending a Council decision, the site concerned shall be subject to Article 6 (2).

Article 6

1. For special areas of conservation, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites.

2. Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.

3. Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only

after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

Article 7

Obligations arising under Article 6 (2), (3) and (4) of this Directive shall replace any obligations arising under the first sentence of Article 4 (4) of Directive 79/409/EEC in respect of areas classified pursuant to Article 4 (1) or similarly recognized under Article 4 (2) thereof, as from the date of implementation of this Directive or the date of classification or recognition by a Member State under Directive 79/409/EEC, where the latter date is later.

Article 8

1. In parallel with their proposals for sites eligible for designation as special areas of conservation, hosting priority natural habitat types and/or priority species, the Member States shall send, as appropriate, to the Commission their estimates relating to the Community co-financing which they consider necessary to allow them to meet their obligations pursuant to Article 6 (1).

2. In agreement with each of the Member States concerned, the Commission shall identify, for sites of Community importance for which co-financing is sought, those measures essential for the maintenance or re-establishment at a favourable conservation status of the priority natural habitat types and priority species on the sites concerned, as well as the total costs arising from those measures.

3. The Commission, in agreement with the Member States concerned, shall assess the financing, including co-financing, required for the operation of the measures referred to in paragraph 2, taking into account, amongst other things, the concentration on the Member State's territory of priority natural habitat types and/or priority species and the relative burdens which the required measures entail.

4. According to the assessment referred to in paragraphs 2 and 3, the Commission shall adopt, having regard to the available sources of funding under the relevant Community instruments and according to the procedure set out in Article 21, a prioritized action framework of measures involving co-financing to be taken when the site has been designated under Article 4 (4).

5. The measures which have not been retained in the action framework for lack of sufficient resources, as well as those included in the abovementioned action framework which have not received the necessary co-financing or have only been partially co-financed, shall be reconsidered in accordance with the procedure set out in Article 21, in the context of the two-yearly review of the action framework and may, in the meantime, be postponed by the Member States pending such review. This review shall take into account, as appropriate, the new situation of the site concerned.

6. In areas where the measures dependent on co-financing are postponed, Member States shall refrain from any new measures likely to result in deterioration of those areas.

Article 9

The Commission, acting in accordance with the procedure laid down in Article 21, shall periodically review the contribution of Natura 2000 towards achievement of the objectives set out in Article 2 and 3. In this context, a special area of conservation may be considered for declassification where this is warranted by natural developments noted as a result of the surveillance provided for in Article 11.

Article 10

Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora.

Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods),

are essential for the migration, dispersal and genetic exchange of wild species.

Article 11

Member States shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 2 with particular regard to priority natural habitat types and priority species.

Protection of species

Article 12

1. Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV (a) in their natural range, prohibiting:

- (a) all forms of deliberate capture or killing of specimens of these species in the wild;
- (b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;
- (c) deliberate destruction or taking of eggs from the wild;
- (d) deterioration or destruction of breeding sites or resting places.

2. For these species, Member States shall prohibit the keeping, transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild, except for those taken legally before this Directive is implemented.

3. The prohibition referred to in paragraph 1 (a) and (b) and paragraph 2 shall apply to all stages of life of the animals to which this Article applies.

4. Member States shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV (a). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.

Article 13

1. Member States shall take the requisite measures to establish a system of strict protection for the plant species listed in Annex IV (b), prohibiting:

- (a) the deliberate picking, collecting, cutting, uprooting or destruction of such plants in their natural range in the wild;
- (b) the keeping, transport and sale or exchange and offering for sale or exchange of specimens of such species taken in the wild, except for those taken legally before this Directive is implemented.

2. The prohibitions referred to in paragraph 1 (a) and (b) shall apply to all stages of the biological cycle of the plants to which this Article applies.

Article 14

1. If, in the light of the surveillance provided for in Article 11, Member States deem it necessary, they shall take measures to ensure that the taking in the wild of specimens of species of wild fauna and flora listed in Annex V as well as their exploitation is compatible with their being maintained at a favourable conservation status.

2. Where such measures are deemed necessary, they shall include continuation of the surveillance provided for in Article 11. Such measures may also include in particular:

- regulations regarding access to certain property,
- temporary or local prohibition of the taking of specimens in the wild and exploitation of certain populations,
- regulation of the periods and/or methods of taking specimens,
- application, when specimens are taken, of hunting and fishing rules which take account of the conservation of such populations,
- establishment of a system of licences for taking specimens or of quotas,
- regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens,
- breeding in captivity of animal species as well as artificial propagation of plant species, under strictly controlled conditions, with a view to reducing the taking of specimens of the wild,
- assessment of the effect of the measures adopted.

Article 15

In respect of the capture or killing of species of wild fauna listed in Annex V (a) and in cases where, in accordance with

Article 16, derogations are applied to the taking, capture or killing of species listed in Annex IV (a), Member States shall prohibit the use of all indiscriminate means capable of causing local disappearance of, or serious disturbance to, populations of such species, and in particular:

- (a) use of the means of capture and killing listed in Annex VI (a);
- (b) any form of capture and killing from the modes of transport referred to in Annex VI (b).

Article 16

1. Provided that there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range, Member States may derogate from the provisions of Articles 12, 13, 14 and 15 (a) and (b):

- (a) in the interest of protecting wild fauna and flora and conserving natural habitats;
- (b) to prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property;
- (c) in the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- (d) for the purpose of research and education, of repopulating and re-introducing these species and for the breeding operations necessary for these purposes, including the artificial propagation of plants;
- (e) to allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species listed in Annex IV in limited numbers specified by the competent national authorities.

2. Member States shall forward to the Commission every two years a report in accordance with the format established by the Committee on the derogations applied under paragraph 1. The Commission shall give its opinion on these derogations within a maximum time limit of 12 months following receipt of the report and shall give an account to the Committee.

3. The reports shall specify:

- (a) the species which are subject to the derogations and the reason for the derogation, including the nature of the risk, with, if appropriate, a reference to alternatives rejected and scientific data used;

- (b) the means, devices or methods authorized for the capture or killing of animal species and the reasons for their use;
- (c) the circumstances of when and where such derogations are granted;
- (d) the authority empowered to declare and check that the required conditions obtain and to decide what means, devices or methods may be used, within what limits and by what agencies, and which persons are to carry but the task;
- (e) the supervisory measures used and the results obtained.

Information

Article 17

1. Every six years from the date of expiry of the period laid down in Article 23, Member States shall draw up a report on the implementation of the measures taken under this Directive. This report shall include in particular information concerning the conservation measures referred to in Article 6 (1) as well as evaluation of the impact of those measures on the conservation status of the natural habitat types of Annex I and the species in Annex II and the main results of the surveillance referred to in Article 11. The report, in accordance with the format established by the committee, shall be forwarded to the Commission and made accessible to the public.

2. The Commission shall prepare a composite report based on the reports referred to in paragraph 1. This report shall include an appropriate evaluation of the progress achieved and, in particular, of the contribution of Natura 2000 to the achievement of the objectives set out in Article 3. A draft of the part of the report covering the information supplied by a Member State shall be forwarded to the Member State in question for verification. After submission to the committee, the final version of the report shall be published by the Commission, not later than two years after receipt of the reports referred to in paragraph 1, and shall be forwarded to the Member States, the European Parliament, the Council and the Economic and Social Committee.

3. Member States may mark areas designated under this Directive by means of Community notices designed for that purpose by the committee.

Research

Article 18

1. Member States and the Commission shall encourage the necessary research and scientific work having regard to

the objectives set out in Article 2 and the obligation referred to in Article 11. They shall exchange information for the purposes of proper coordination of research carried out at Member State and at Community level.

2. Particular attention shall be paid to scientific work necessary for the implementation of Articles 4 and 10, and transboundary cooperative research between Member States shall be encouraged.

Procedure for amending the Annexes

Article 19

Such amendments as are necessary for adapting Annexes I, II, III, V and VI to technical and scientific progress shall be adopted by the Council acting by qualified majority on a proposal from the Commission.

Such amendments as are necessary for adapting Annex IV to technical and scientific progress shall be adopted by the Council acting unanimously on a proposal from the Commission.

Committee

Article 20

The Commission shall be assisted by a committee consisting of representatives of the Member States and chaired by a representative of the Commission.

Article 21

1. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the Chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148 (2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The Chairman shall not vote.

2. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a

proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on the expiry of three months from the date of referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

Supplementary provisions

Article 22

In implementing the provisions of this Directive, Member States shall:

- (a) study the desirability of re-introducing species in Annex IV that are native to their territory where this might contribute to their conservation, provided that an investigation, also taking into account experience in other Member States or elsewhere, has established that such re-introduction contributes effectively to re-establishing these species at a favourable conservation status and that it takes place only after proper consultation of the public concerned;
- (b) ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction. The results of the assessment undertaken shall be forwarded to the committee for information;
- (c) promote education and general information on the need to protect species of wild fauna and flora and to conserve their habitats and natural habitats.

Final provisions

Article 23

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive within two years of its notification. They shall forthwith inform the Commission thereof.

2. When Member States adopt such measures, they shall contain a reference to this Directive or be accompanied by such reference on the occasion of their official publication. The methods of making such a reference shall be laid down by the Member States.

3. Member States shall communicate to the Commission the main provisions of national law which they adopt in the field covered by this Directive.

Article 24

This Directive is addressed to the Member States.

Done at Brussels, 21 May 1992.

For the Council
The President

Arlindo MARQUES CUNHA

ANNEX I

NATURAL HABITAT TYPES OF COMMUNITY INTEREST WHOSE CONSERVATION REQUIRES THE DESIGNATION OF SPECIAL AREAS OF CONSERVATION

Interpretation

Code: The hierarchical classification of habitats produced through the Corine programme ⁽¹⁾ (Corine biotopes project) is the reference work for this Annex. Most types of natural habitat quoted are accompanied by the corresponding Corine code listed in the Technical Handbook, Volume 1, pp. 73—109, Corine/Biotope/89/2.2, 19 May 1988, partially updated 14 February 1989.

The sign 'x' combining codes indicates associated habitat types, e.g. 35.2 x 64.1 — Open grassland with *Corynephorus* and *Agrostis* (35.2), in combination with continental dunes (64.1).

The sign '**' indicates priority habitat types.

COSTAL AND HALOPHYTIC HABITATS

Open sea and tidal areas

11.25	Sandbanks which are slightly covered by sea water all the time
11.34	*Posidonia beds
13.2	Estuaries
14	Mudflats and sandflats not covered by seawater at low tide
21	*Lagoons
—	Large shallow inlets and bays
—	Reefs
—	Marine 'columns' in shallow water made by leaking gases

Sea cliffs and shingle or stony beaches

17.2	Annual vegetation of drift lines
17.3	Perennial vegetation of stony banks
18.21	Vegetated sea cliffs of the Atlantic and Baltic coasts
18.22	Vegetated sea cliffs of the Mediterranean coasts (with endemic <i>Limonium</i> spp.)
18.23	Vegetated sea cliffs of the Macaronesian coasts (flora endemic to these coasts)

Atlantic and continental salt marshes and salt meadows

15.11	<i>Salicornia</i> and other annuals colonizing mud and sand
15.12	Spartina swards (<i>Spartinion</i>)
15.13	Atlantic salt meadows (<i>Glauco-Puccinellietalia</i>)
15.14	*Continental salt meadows (<i>Puccinellietalia distantis</i>)

Mediterranean and thermo-Atlantic salt marshes and salt meadows

15.15	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
15.16	Mediterranean and thermo-Atlantic halophilous scrubs (<i>Arthrocnemetalia fruticosae</i>)
15.17	Iberia halo-nitrophilous scrubs (<i>Pegano-Salsoletea</i>)

Salt and gypsum continental steppes

15.18	*Salt steppes (<i>Limonietalia</i>)
15.19	*Gypsum steppes (<i>Gypsophiletalia</i>)

⁽¹⁾ Corine: Council Decision 85/338/EEC of 27 June 1985 (OJ No L 176, 6. 7. 1985, p. 14).

COASTAL SAND DUNES AND CONTINENTAL DUNES

Sea dunes of the Atlantic, North Sea and Baltic coasts

- 16.211 Embryonic shifting dunes
 16.212 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
 16.221 to 16.227 *Fixed dunes with herbaceous vegetation (grey dunes):
 16.221 *Galio-Koelerion albescentis*
 16.222 *Euphorbio-Helichryson*
 16.223 *Crucianellion maritimae*
 16.224 *Euphorbia terracina*
 16.225 *Mesobromion*
 16.226 *Trifolio-Gerantietea sanguinei*, *Galio maritimi-Geranium sanguinei*
 16.227 *Thero-Airion*, *Botrychio-Polygaletum*, *Tuberarion guttatae*
 16.23 *Decalcified fixed dunes with *Empetrum nigrum*
 16.24 Eu-atlantic decalcified fixed dunes (*Calluno-Ulicetea*)
 16.25 Dunes with *Hyppophae rhamnoides*
 16.26 Dunes with *Salix arenaria*
 16.29 Wooded dunes of the Atlantic coast
 16.31 to 16.35 Humid dune slacks
 1.A Machairs (* in machairs in Ireland)

Sea dunes of the Mediterranean coast

- 16.223 *Crucianellion maritimae* fixed beach dunes
 16.224 Dunes with *Euphorbia terracina*
 16.228 *Malcolmietalia* dune grasslands
 16.229 *Brachypodietalia* dune grasslands with annuals
 16.27 *Dune juniper thickets (*Juniperus spp.*)
 16.28 Dune sclerophyllous scrubs (*Cisto-Lavenduletalia*)
 16.29 x 42.8 *Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*

Continental dunes, old and decalcified

- 64.1 x 31.223 Dry sandy heaths with *Calluna* and *Genista*
 64.1 x 31.227 Dry sandy heaths with *Calluna* and *Empetrum nigrum*
 64.1 x 35.2 Open grassland with *Corynephorus* and *Agrostis* of continental dunes

FRESHWATER HABITATS

Standing water

- 22.11 x 22.31 Oligotrophic waters containing very few minerals of Atlantic sandy plains with amphibious vegetation: *Lobelia*, *Littorelia* and *Isoetes*
 22.11 x 22.34 Oligotrophic waters containing very few minerals of West Mediterranean sandy plains with *Isoetes*
 22.12 x (22.31 and 22.32) Oligotrophic waters in medio-European and perialpine area with amphibious vegetation: *Littorelia* or *Isoetes* or annual vegetation on exposed banks (*Nanocyperetalia*)
 22.12 x 22.44 Hard oligo-mesotrophic waters with benthic vegetation of chara formations
 22.13 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation
 22.14 Dystrophic lakes
 22.34 *Mediterranean temporary ponds
 — *Turloughs (Ireland)

Running water

Sections of water courses with natural or semi-natural dynamics (minor, average and major beds) where the water quality shows no significant deterioration

- 24.221 and 24.222 Alpine rivers and the herbaceous vegetation along their banks
 24.223 Alpine rivers and their ligneous vegetation with *Myricaria germanica*
 24.224 Alpine rivers and their ligneous vegetation with *Salix elaeagnos*

24.225	Constantly flowing Mediterranean rivers with <i>Glaucium flavum</i>
24.4	Floating vegetation of ranunculus of plane, submountainous rivers
24.52	<i>Chenopodietum rubri</i> of submountainous rivers
24.53	Constantly flowing Mediterranean rivers: <i>Paspalo-Agrostidion</i> and hanging curtains of <i>Salix</i> and <i>Populus alba</i>
—	Intermittently flowing Mediterranean rivers

TEMPERATE HEATH AND SCRUB

31.11	Northern Atlantic wet heaths with <i>Erica tetralix</i>
31.12	*Southern Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>
31.2	*Dry heaths (all subtypes)
31.234	*Dry coastal heaths with <i>Erica vagans</i> and <i>Ulex maritimus</i>
31.3	*Endemic macaronesian dry heaths
31.4	Alpine and subalpine heaths
31.5	*Scrub with <i>Pinus mugo</i> and <i>Rhododendron hirsutum</i> (<i>Mugo-Rhododenretum hirsuti</i>)
31.622	Sub-Arctic willow scrub
31.7	Endemic oro-Mediterranean heaths with gorse

SCLEROPHYLLOUS SCRUB (MATORRAL)

Sub-Mediterranean and temperate

31.82	Stable <i>Buxus sempervirens</i> formations on calcareous rock slopes (<i>Berberidion p.</i>)
31.842	Mountain <i>Genista purgans</i> formations
31.88	<i>Juniperus communis</i> formations on calcareous heaths or grasslands
31.89	* <i>Cistus palhinhae</i> formations on maritime wet heaths (<i>Junipero-Cistetum palhinhae</i>)

Mediterranean arborescent matorral

32.131 to 32.135	Juniper formations
32.17	*Matorral with <i>Zyziphus</i>
32.18	*Matorral with <i>Laurus nobilis</i>

Thermo-Mediterranean and pre-steppe brush

32.216	Laurel thickets
32.217	Low formations of euphorbia close to cliffs
32.22 bis 32.26	All types

Phrygana

33.1	<i>Astragalo-Plantaginetum subulatae phrygana</i>
33.3	<i>Sarcopoterium spinosum phrygana</i>
33.4	Cretan formations (<i>Euphorbieto-Verbascion</i>)

NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS

Natural grasslands

34.11	*Karstic calcareous grasslands (<i>Alysso-Sedion albi</i>)
34.12	*Xeric sand calcareous grasslands (<i>Koelerion glaucae</i>)
34.2	Calaminarian grasslands
36.314	Siliceous Pyrenean grasslands with <i>Festuca eskia</i>
36.32	Siliceous alpine and boreal grass
36.36	Siliceous <i>Festuca indigesta</i> Iberian grasslands
36.41 bis 36.45	Alpine calcareous grasslands
36.5	Macaronesian mountain grasslands

Semi-natural dry grasslands and scrubland facies

- 34.31 to 34.34 On calcareous substrates (*Festuco Brometalia*)
(* important orchid sites)
- 34.5 *Pseudo-steppe with grasses and annuals (*Thero-Brachypodietea*)
- 35.1 *Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and
submountain areas, in continental Europe)

Sclerophyllous grazed forests (dehesas)

- 32.11 With *Quercus suber* and/or *Quercus ilex*

Semi-natural tall-herb humid meadows

- 37.31 Molinia meadows on chalk and clay (*Eu-Molinion*)
- 37.4 Mediterranean tall-herb and rush meadows (*Molinio-Holoschoenion*)
- 37.7 and 37.8 Eutrophic tall herbs
- *Cnidion venosae* meadows liable to flooding

Mesophile grasslands

- 38.2 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
- 38.3 Mountain hay meadows (British types with *Geranium sylvaticum*)

RAISED BOGS AND MIRES AND FENS**Sphagnum acid bogs**

- 51.1 *Active raised bogs
- 51.2 Degraded raised bogs
(still capable of natural regeneration)
- 52.1 and 52.2 Blanket bog (* active only)
- 54.5 Transition mires and quaking bogs
- 54.6 Depressions on peat substrates (*Rhynchosporion*)

Calcareous fens

- 53.3 *Calcareous fens with *Cladium mariscus* and *Carex davalliana*
- 54.12 *Petrifying springs with tufa formation (*Cratoneurion*)
- 54.2 Alkaline fens
- 54.3 *Alpine pioneer formations of *Caricion bicoloris-atrofuscae*

ROCKY HABITATS AND CAVES**Scree**

- 61.1 Siliceous
- 61.2 Eutric
- 61.3 Western Mediterranean and alpine thermophilous
- 61.4 Balkan
- 61.5 Medio-European siliceous
- 61.6 *Medio-European calcareous

Chasmophytic vegetation on rocky slopes

- 62.1 and 62.1A Calcareous sub-types
- 62.2 Silicolous sub-types
- 62.3 Pioneer vegetation of rock surfaces
- 62.4 *Limestone pavements

Other rocky habitats

- 65 Caves not open to the public
- Fields of lava and natural excavations

- Submerged or partly submerged sea caves
- Permanent glaciers

FORESTS

(Sub)natural woodland vegetation comprising native species forming forests of tall trees, with typical undergrowth, and meeting the following criteria: rare or residual, and/or hosting species of Community interest

Forests of temperate Europe

- 41.11 *Luzulo-Fagetum* beech forests
- 41.12 Beech forests with *Ilex* and *Taxus*, rich in epiphytes (*Ilici-Fagion*)
- 41.13 *Asperulo-Fagetum* beech forests
- 41.15 Subalpine beech woods with *Acer* and *Rumex arifolius*
- 41.16 Calcareous beech forest (*Cephalanthero-Fagion*)
- 41.24 *Stellario-Carpinetum* oak-hornbeam forests
- 41.26 *Galio-Carpinetum* oak-hornbeam forests
- 41.4 **Tilio-Acerion* ravine forests
- 41.51 Old acidophilous oak woods with *Quercus robur* on sandy plains
- 41.53 Old oak woods with *Ilex* and *Blechnum* in the British Isles
- 41.86 *Fraxinus angustifolia* woods
- 42.51 *Caledonian forest
- 44.A1 to 44.A4 *Bog woodland
- 44.3 *Residual alluvial forests (*Alnion glutinoso-incanae*)
- 44.4 Mixed oak-elm-ash forests of great rivers

Mediterranean deciduous forests

- 41.181 *Apennine beech forests with *Taxus* and *Ilex*
- 41.184 *Apennine beech forests with *Abies alba* and beech forests with *Abies nebrodensis*
- 41.6 Galicio-Portuguese oak woods with *Quercus robur* and *Quercus pyrenaica*
- 41.77 *Quercus faginea* woods (Iberian Peninsula)
- 41.85 *Quercus trojana* woods (Italy and Greece)
- 41.9 Chestnut woods
- 41.1A x 42.17 Hellenic beech forests with *Abies borisii-regis*
- 41.1B *Quercus frainetto* woods
- 42.A1 Cypress forests (*Acero-Cupression*)
- 44.17 *Salix alba* and *Populus alba* galleries
- 44.52 Riparian formations on intermittent Mediterranean water courses with *Rhododendron ponticum*, *Salix* and others
- 44.7 Oriental plane woods (*Platanion orientalis*)
- 44.8 Thermo-Mediterranean riparian galleries (*Nerio-Tamariceteae*) and south-west Iberian Peninsula riparian galleries (*Securinegion tinctoriae*)

Mediterranean sclerophyllous forests

- 41.7C Cretan *Quercus brachyphylla* forests
- 45.1 *Olea* and *Ceratonia* forests
- 45.2 *Quercus suber* forests
- 45.3 *Quercus ilex* forests
- 45.5 *Quercus macrolepis* forests
- 45.61 to 45.63 *Macaronesian laurel forests (*Laurus*, *Ocotea*)
- 45.7 *Palm groves of *Phoenix*
- 45.8 Forests of *Ilex aquifolium*

Alpine and subalpine coniferous forests

- 42.21 to 42.23 Acidophilous forests (*Vaccinio-Piceetea*)
- 42.31 and 42.32 Alpine forests with larch and *Pinus cembra*
- 42.4 *Pinus uncinata* forests (* on gypsum or limestone)

Mediterranean mountainous coniferous forests

- 42.14 *Appenine *Abies alba* and *Picea excelsa* forests
- 42.19 *Abies pinsapo* forests
- 42.61 to 42.66 *Mediterranean pine forests with endemic black pines
- 42.8 Mediterranean pine forests with endemic Mesogean pines, including *Pinus mugo* and *Pinus leucodermis*
- 42.9 Macaronesian pine forests (endemic)
- 42.A2 to 42.A5 and 42.A8 *Endemic Mediterranean forests with *Juniperus* spp.
- 42.A6 **Tetraclinis articulata* forests (Andalusia)
- 42.A71 to 42.A73 **Taxus baccata* woods
-

ANNEX II

ANIMAL AND PLANT SPECIES OF COMMUNITY INTEREST WHOSE CONSERVATION REQUIRES
THE DESIGNATION OF SPECIAL AREAS OF CONSERVATION

Interpretation

(a) Annex II follows on from Annex I for the establishment of a consistent network of special areas of conservation.

(b) The species listed in this Annex are indicated:

- by the name of the species or subspecies, or
- by the body of species belonging to a higher taxon or to a designated part of that taxon.

The abbreviation 'spp.' after the name of a family or genus designates all the species belonging to that family or genus.

(c) *Symbols*

An asterisk (*) before the name of a species indicates that the species is a priority species.

Most species listed in this Annex are also listed in Annex IV.

Where a species appears in this Annex but does not appear in either Annex IV or Annex V, the species name is followed by the symbol (o); where a species which appears in this Annex also appears in Annex V but does not appear in Annex IV, its name is followed by the symbol (V).

(a) *ANIMALS**VERTEBRATES**MAMMALS**INSECTIVORA**Talpidae*

Galemys pyrenaicus

*CHIROPTERA**Rhinolophidae*

Rhinolophus blasii
Rhinolophus euryale
Rhinolophus ferrumequinum
Rhinolophus hipposideros
Rhinolophus mehelyi

Vespertilionidae

Barbastella barbastellus
Miniopterus schreibersi
Myotis bechsteini
Myotis blythi
Myotis capaccinii
Myotis dasycneme
Myotis emarginatus
Myotis myotis

*RODENTIA**Sciuridae*

Spermophilus citellus

Castoridae

Castor fiber

Microtidae

Microtus cabreræ
 **Microtus oeconomus arenicola*

CARNIVORA*Canidae*

- **Canis lupus* (Spanish populations: only those south of the Duero; Greek populations: only those south of the 39th parallel)

Ursidae

- **Ursus arctos*

Mustelidae

- Lutra lutra*
- Mustela lutreola*

Felidae

- Lynx lynx*
- **Lynx pardina*

Phocidae

- Halichoerus grypus* (V)
- **Monachus monachus*
- Phoca vitulina* (V)

ARTIODACTYLA*Cervidae*

- **Cervus elaphus corsicanus*

Bovidae

- Capra aegagrus* (natural populations)
- **Capra pyrenaica pyrenaica*
- Ovis ammon musimon* (natural populations — Corsica and Sardinia)
- Rupicapra rupicapra balcanica*
- **Rupicapra ornata*

CETACEA

- Tursiops truncatus*
- Phocoena phocoena*

REPTILES**TESTUDINATA***Testudinidae*

- Testudo hermanni*
- Testudo graeca*
- Testudo marginata*

Cheloniidae

- **Caretta caretta*

Emydidae

- Emys orbicularis*
- Mauremys caspica*
- Mauremys leprosa*

SAURIA*Lacertidae*

- Lacerta monticola*
- Lacerta schreiberi*
- Gallotia galloti insulanagae*
- **Gallotia simonyi*
- Podarcis lilfordi*
- Podarcis pityusensis*

Scincidae

- Chalcides occidentalis*

Gekkonidae

- Phyllodactylus europaeus*

OPHIDIA*Colubridae*

- Elaphe quatuorlineata*
- Elaphe situla*

Viperidae

- **Vipera schweizeri*
- Vipera ursinii*

AMPHIBIANS**CAUDATA***Salamandridae*

- Chioglossa lusitanica*
- Mertensiella luschani*
- **Salamandra salamandra aurorae*
- Salamandrina terdigitata*
- Triturus cristatus*

Proteidae

- Proteus anguinus*

Plethodontidae

- Speleomantes ambrosii*
- Speleomantes flavus*
- Speleomantes genei*
- Speleomantes imperialis*
- Speleomantes supramontes*

ANURA*Discoglossidae*

- Bombina bombina*
- Bombina variegata*
- Discoglossus jeanneae*
- Discoglossus montalentii*
- Discoglossus sardus*
- **Alytes muletensis*

Ranidae

- Rana latastei*

Pelobatidae

- **Pelobates fuscus insubricus*

FISH**PETROMYZONIFORMES***Petromyzonidae*

- Eudontomyzon* spp. (o)
- Lampetra fluviatilis* (V)
- Lampetra planeri* (o)
- Lethenteron zanandrai* (V)
- Petromyzon marinus* (o)

ACIPENSERIFORMES*Acipenseridae*

- **Acipenser naccarii*
- **Acipenser sturio*

ATHERINIFORMES*Cyprinodontidae*

- Aphanius iberus* (o)
- Aphanius fasciatus* (o)
- **Valencia hispanica*

SALMONIFORMES*Salmonidae*

- Hucho hucho* (natural populations) (V)
- Salmo salar* (only in fresh water) (V)
- Salmo marmoradus* (o)
- Salmo macrostigma* (o)

Coregonidae

**Coregonus oxyrhynchus* (anadromous populations in certain sectors of the North Sea)

CYPRINIFORMES

Cyprinidae

Alburnus vulturius (o)
Alburnus albidus (o)
Anaecypris hispanica
Aspius aspius (o)
Barbus plebejus (V)
Barbus meridionalis (V)
Barbus capito (V)
Barbus comiza (V)
Chalcalburnus chalcoides (o)
Chondrostoma soetta (o)
Chondrostoma polylepis (o)
Chondrostoma genei (o)
Chondrostoma lusitanicum (o)
Chondrostoma toxostoma (o)
Gobio albipinnatus (o)
Gobio uranoscopus (o)
Iberocypris palaciosi (o)
 **Ladigesocypris ghigii* (o)
Leuciscus lucomonis (o)
Leuciscus souffia (o)
Phoxinellus spp. (o)
Rutilus pigus (o)
Rutilus rubilio (o)
Rutilus arcasii (o)
Rutilus macrolepidotus (o)
Rutilus lemmingii (o)
Rutilus friesii meidingeri (o)
Rutilus alburnoides (o)
Rhodeus sericeus amarus (o)
Scardinius graecus (o)

Cobitidae

Cobitis conspersa (o)
Cobitis larvata (o)
Cobitis trichonica (o)
Cobitis taenia (o)
Misgurnis fossilis (o)
Sabanejewia aurata (o)

PERCIFORMES

Percidae

Gymnocephalus schraetzer (V)
Zingel spp. [(o) except *Zingel asper* and *Zingel zingel* (V)]

Gobiidae

Pomatoschistus canestrini (o)
Padogobius panizzai (o)
Padogobius nigricans (o)

CLUPEIFORMES

Clupeidae

Alosa spp. (V)

SCORPAENIFORMES

Cottidae

Cottus ferruginosus (o)
Cottus petiti (o)
Cottus gobio (o)

SILURIFORMES

Siluridae

Silurus aristotelis (V)

INVERTEBRATES

ARTHROPODS

CRUSTACEA

Decapoda

Austropotamobius pallipes (V)

INSECTA

Coleoptera

Buprestis splendens
 *Carabus olympiae
 Cerambyx cerdo
 Cucujus cinnaberinus
 Dytiscus latissimus
 Graphoderus bilineatus
 Limoniscus violaceus (o)
 Lucanus cervus (o)
 Morimus funereus (o)
 *Osmoderma eremita
 *Rosalia alpina

Lepidoptera

*Callimorpha quadripunctata (o)
 Coenonympha oedippus
 Erebia calcaria
 Erebia christi
 Eriogaster catax
 Euphydryas aurinia (o)
 Graellsia isabellae (V)
 Hypodryas maturna
 Lycaena dispar
 Maculinea nausithous
 Maculinea teleius
 Melanagria arge
 Papilio hospiton
 Plebicula golgus

Mantodea

Apteromantis aptera

Odonata

Coenagrion hylas (o)
 Coenagrion mercuriale (o)
 Cordulegaster trinacriae
 Gomphus graslinii
 Leucorrhina pectoralis
 Lindenia tetraphylla
 Macromia splendens
 Ophiogomphus cecilia
 Oxygastra curtisii

Orthoptera

Baetica ustulata

MOLLUSCS

GASTROPODA

Caseolus calculus
 Caseolus commixta
 Caseolus sphaerula
 Discula leacockiana
 Discula tabellata
 Discus defloratus
 Discus guerinianus
 Elona quimperiana
 Geomalacus maculosus
 Geomitra moniziana
 Helix subplicata

Leiostyla abbreviata
Leiostyla cassida
Leiostyla corneocostata
Leiostyla gibba
Leiostyla lamellosa
Vertigo angustior (o)
Vertigo genesii (o)
Vertigo geyeri (o)
Vertigo moulinsiana (o)

BIVALVIA*Unionoida*

Margaritifera margaritifera (V)
Unio crassus

(b) PLANTS**PTERIDOPHYTA****ASPLENIACEAE**

Asplenium jahandiezii (Litard.) Rouy

BLECHNACEAE

Woodwardia radicans (L.) Sm.

DICKSONIACEAE

Culcita macrocarpa C. Presl

DRYOPTERIDACEAE

**Dryopteris corleyi* Fraser-Jenk.

HYMENOPHYLLACEAE

Trichomanes speciosum Willd.

ISOETACEAE

Isoetes boryana Durieu
Isoetes malinverniana Ces. & De Not.

MARSILEACEAE

Marsilea batardae Launert
Marsilea quadrifolia L.
Marsilea strigosa Willd.

OPHIOGLOSSACEAE

Botrychium simplex Hitchc.
Ophioglossum polyphyllum A. Braun

GYMNOSPERMAE**PINACEAE**

**Abies nebrodensis* (Lojac.) Mattei

ANGIOSPERMAE**ALISMATACEAE**

Caldesia parnassifolia (L.) Parl.
Luronium natans (L.) Raf.

AMARYLLIDACEAE

Leucojum nicaeense Ard.
Narcissus asturiensis (Jordan) Pugsley
Narcissus calcicola Mendonça
Narcissus cyclamineus DC.
Narcissus fernandesii G. Pedro
Narcissus humilis (Cav.) Traub

- **Narcissus nevadensis* Pugsley
- Narcissus pseudonarcissus* L.
 subsp. *nobilis* (Haw.) A. Fernandes
- Narcissus scaberulus* Henriq.
- Narcissus triandrus* (Salisb.) D. A. Webb
 subsp. *capax* (Salisb.) D. A. Webb.
- Narcissus viridiflorus* Schousboe

BORAGINACEAE

- **Anchusa crispa* Viv.
- **Lithodora nitida* (H. Ern) R. Fernandes
- Myosotis lusitanica* Schuster
- Myosotis rehsteineri* Wartm.
- Myosotis retusifolia* R. Afonso
- Omphalodes kuzinskyana* Willk.
- **Omphalodes littoralis* Lehm.
- Solenanthus albanicus* (Degen & al.) Degen & Baldacci
- **Symphytum cycladense* Pawl.

CAMPANULACEAE

- Asyneuma giganteum* (Boiss.) Bornm.
- **Campanula sabatia* De Not.
- Jasione crispa* (Pourret) Samp.
 subsp. *serpentinica* Pinto da Silva
- Jasione lusitanica* A. DC.

CARYOPHYLLACEAE

- **Arenaria nevadensis* Boiss. & Reuter
- Arenaria provincialis* Chater & Halliday
- Dianthus cintranus* Boiss. & Reuter
 subsp. *cintranus* Boiss. & Reuter
- Dianthus marizii* (Samp.) Samp.
- Dianthus rupicola* Biv.
- **Gypsophila papillosa* P. Porta
- Herniaria algarvica* Chaudri
- Herniaria berlingiana* (Chaudhri) Franco
- **Herniaria latifolia* Lapeyr.
 subsp. *litardierei* gamis
- Herniaria maritima* Link
- Moehringia tommasinii* Marches.
- Petrocoptis grandiflora* Rothm.
- Petrocoptis montisicciana* O. Bolos & Rivas Mart.
- Petrocoptis pseudoviscosa* Fernandez Casas
- Silene cintrana* Rothm.
- **Silene hicesiae* Brullo & Signorello
- Silene hifacensis* Rouy ex Willk.
- **Silene holzmanii* Heldr. ex Boiss.
 Silene longicilia (Brot.) Otth.
- Silene mariana* Pau
- **Silene orphanidis* Boiss.
- **Silene rothmaleri* Pinto da Silva
- **Silene velutina* Pourret ex Loisel.

CHENOPODIACEAE

- **Bassia saxicola* (Guss.) A. J. Scott
- **Kochia saxicola* Guss.
- **Salicornia veneta* Pignatti & Lausi

CISTACEAE

- Cistus palhinhae* Ingram
- Halimium verticillatum* (Brot.) Sennen
- Helianthemum alypoides* Losa & Rivas Goday
- Helianthemum caput-felis* Boiss.
- **Tuberaria major* (Willk.) Pinto da Silva & Roseira

COMPOSITAE

- **Anthemis glaberrima* (Rech. f.) Greuter
- **Artemisia granatensis* Boiss.
- **Aster pyrenaicus* Desf. ex DC.
- **Aster sorrentinii* (Tod) Lojac.
- **Carduus myriacanthus* Salzm. ex DC.

- **Centaurea alba* L.
 subsp. *heldreichii* (Halacsy) Dostal
- **Centaurea alba* L.
 subsp. *princeps* (Boiss. & Heldr.) Gugler
- **Centaurea attica* Nyman
 subsp. *megarensis* (Halacsy & Hayek) Dostal
- **Centaurea balearica* J. D. Rodriguez
- **Centaurea borjae* Valdes-Berm. & Rivas Goday
- **Centaurea citricolor* Font Quer
- Centaurea corymbosa* Pourret
- Centaurea gadorensis* G. Bianca
- **Centaurea horrida* Badaro
- **Centaurea kalambakensis* Freyn & Sint.
- Centaurea kartschiana* Scop.
- **Centaurea lactiflora* Halacsy
- Centaurea micrantha* Hoffmanns. & Link
 subsp. *herminii* (Rouy) Dostál
- **Centaurea niederi* Heldr.
- **Centaurea peucedanifolia* Boiss. & Orph.
- **Centaurea pinnata* Pau
- Centaurea pulvinata* (G. Bianca) G. Bianca
- Centaurea rothmalerana* (Arènes) Dostál
- Centaurea vicentina* Mariz
- **Crepis crocifolia* Boiss. & Heldr.
- Crepis granatensis* (Willk.) B. Bianca & M. Cueto
- Erigeron frigidus* Boiss. ex DC.
- Hymenostemma pseudanthemis* (Kunze) Willd.
- **Jurinea cyanoides* (L.) Reichenb.
- **Jurinea fontqueri* Cuatrec.
- **Lamyropsis microcephala* (Moris) Dittrich & Greuter
- Leontodon microcephalus* (Boiss. ex DC.) Boiss.
- Leontodon boryi* Boiss.
- **Leontodon sculus* (Guss.) Finch & Sell
- Leuzea longifolia* Hoffmanns. & Link
- Ligularia sibirica* (L.) Cass.
- Santolina impressa* Hoffmanns. & Link
- Santolina semidentata* Hoffmanns. & Link
- **Senecio elodes* Boiss. ex DC.
- Senecio nevadensis* Boiss. & Reuter

CONVOLVULACEAE

- **Convolvulus argyrothamnus* Greuter
- **Convolvulus Fernandes Pinto da Silva & Teles*

CRUCIFERAE

- Alyssum pyrenaicum* Lapeyr.
- Arabis sadina* (Samp.) P. Cout.
- **Biscutella neustriaca* Bonnet
- Biscutella vicentina* (Samp.) Rothm.
- Boleum asperum* (Pers.) Desvaux
- Brassica glabrescens* Poldini
- Brassica insularis* Moris
- **Brassica macrocarpa* Guss.
- Coincya cintrana* (P. Cout.) Pinto da Silva
- **Coincya rupestris* Rouy
- **Coronopus navasii* Pau
- Diplotaxis ibicensis* (Pau) Gomez-Campo
- **Diplotaxis siettiana* Maire
- Diplotaxis vicentina* (P. Cout.) Rothm.
- Erucastrum palustre* (Pirona) Vis.
- **Iberis arbuscula* Runemark
- Iberis procumbens* Lange
 subsp. *microcarpa* Franco & Pinto da Silva
- **Ionopsidium acaule* (Desf.) Reichenb.
- Ionopsidium savianum* (Caruel) Ball ex Arcang.
- Sisymbrium cavanillesianum* Valdes & Castroviejo
- Sisymbrium supinum* L.

CYPERACEAE

- **Carex panormitana* Guss.
- Eleocharis carniolica* Koch

DIOSCOREACEAE

- **Borderea chouardii* (Gausson) Heslot

DROSERACEAE

- Aldrovanda vesiculosa* L.

EUPHORBIACEAE

- **Euphorbia margalidiana* Kubber & Lewejohann
- Euphorbia transtagana* Boiss.

GENTIANACEAE

- **Centaurium rigualii* Esteve Chueca
- **Centaurium somedanum* Lainz
- Gentiana ligustica* R. de Vilm. & Chopinet
- Gentianella angelica* (Pugsley) E. F. Warburg

GERANIACEAE

- **Erodium astragaloides* Boiss. & Reuter
- Erodium paularense* Fernandez-Gonzalez & Izco
- **Erodium rupicola* Boiss.

GRAMINEAE

- Avenula hackelii* (Henriq.) Holub
- Bromus grossus* Desf. ex DC.
- Coleanthus subtilis* (Tratt.) Seidl
- Festuca brigantina* (Markgr.-Dannenb.) Markgr.-Dannenb.
- Festuca duriotagana* Franco & R. Afonso
- Festuca elegans* Boiss.
- Festuca henriquesii* Hack.
- Festuca sumilusitanica* Franco & R. Afonso
- Gaudinia hispanica* Stace & Tutin
- Holcus setiglumis* Boiss. & Reuter
- subsp. *duriensis* Pinto da Silva
- Micropyropsis tuberosa* Romero — Zarco & Cabezudo
- Pseudarrhenatherum pallens* (Link) J. Holub
- Puccinellia pungens* (Pau) Paunero
- **Stipa austroitalica* Martinovsky
- **Stipa bavarica* Martinovsky & H. Scholz
- **Stipa veneta* Moraldo

GROSSULARIACEAE

- **Ribes sardum* Martelli

HYPERICACEAE

- **Hypericum aciferum* (Greuter) N. K. B. Robson

JUNCACEAE

- Juncus valvatus* Link

LABIATAE

- Dracocephalum austriacum* L.
- **Micromeria taygetea* P. H. Davis
- Nepeta dirphya* (Boiss.) Heldr. ex Halacsy
- **Nepeta sphaciotica* P. H. Davis
- Origanum dictamnus* L.
- Sideritis incana*
- subsp. *glauca* (Cav.) Malagarriga
- Sideritis javalambrensis* Pau
- Sideritis serrata* Cav. ex Lag.
- Teucrium lepicephalum* Pau
- Teucrium turredanum* Losa & Rivas Goday
- **Thymus camphoratus* Hoffmanns. & Link
- Thymus carnosus* Boiss.
- **Thymus cephalotos* L.

LEGUMINOSAE

- Anthyllis hystrix* Cardona, Contandr. & E. Sierra
- **Astragalus algarbiensis* Coss. ex Bunge
- **Astragalus aquilanus* Anzalone
- Astragalus centralpinus* Braun-Blanquet

- *Astragalus maritimus Moris
- Astragalus tremolsianus Pau
- *Astragalus verrucosus Moris
- *Cytisus aeolicus Guss. ex Lindl.
- Genista dorycnifolia Font Quer
- Genista holopetala (Fleischm. ex Koch) Baldacci
- Melilotus segetalis (Brot.) Ser.
- subsp. fallax Franco
- *Ononis hackelii Lange
- Trifolium saxatile All.
- *Vicia bifoliolata J. D. Rodriguez

LENTIBULARIACEAE

- Pinguicula nevadensis (Lindb.) Casper

LILIACEAE

- Allium grosii Font Quer
- *Androcymbium rechingeri Greuter
- *Asphodelus bento-rainhae P. Silva
- Hyacinthoides vicentina (Hoffmanns. & Link) Rothm.
- *Muscari gussonei (Parl.) Tod.

LINACEAE

- *Linum muelleri Moris

LYTHRACEAE

- *Lythrum flexuosum Lag.

MALVACEAE

- Kosteletzkya pentacarpos (L.) Ledeb.

NAJADACEAE

- Najas flexilis (Willd.) Rostk. & W. L. Schmidt

ORCHIDACEAE

- *Cephalanthera cucullata Boiss. & Heldr.
- Cypripedium calceolus L.
- Liparis loeselii (L.) Rich.
- *Ophrys lunulata Parl.

PAEONIACEAE

- Paeonia cambessedesii (Willk.) Willk.
- Paeonia parnassica Tzanoudakis
- Paeonia clusii F. C. Stern
- subsp. rhodia (Stearn) Tzanoudakis

PALMAE

- Phoenix theophrasti Greuter

PLANTAGINACEAE

- Plantago algarbiensis Samp.
- Plantago almogravensis Franco

PLUMBAGINACEAE

- Armeria berlengensis Daveau
- *Armeria helodes Martini & Pold
- Armeria neglecta Girard
- Armeria pseudarmeria (Murray) Mansfeld
- *Armeria rouyana Daveau
- Armeria soleirolii (Duby) Godron
- Armeria velutina Welv. ex Boiss. & Reuter
- Limonium dodartii (Girard) O. Kuntze
- subsp. lusitanicum (Daveau) Franco
- *Limonium insulare (Beg. & Landi) Arrig. & Diana
- Limonium lanceolatum (Hoffmanns. & Link) Franco
- Limonium multiflorum Erben
- *Limonium pseudolaetum Arrig. & Diana
- *Limonium strictissimum (Salzmann) Arrig.

POLYGONACEAE

- Polygonum praelongum Coode & Cullen
- Rumex rupestris Le Gall

PRIMULACEAE

- Androsace mathildae Levier
- Androsace pyrenaica Lam.
- *Primula apennina Widmer
- Primula palinuri Petagna
- Soldanella villosa Darracq.

RANUNCULACEAE

- *Aconitum corsicum Gaye
- Adonis distorta Ten.
- Aquilegia bertolonii Schott
- Aquilegia kitaibelii Schott
- *Aquilegia pyrenaica D. C.
subsp. cazorlensis (Heywood) Galiano
- *Consolida samia P. H. Davis
- Pulsatilla patens (L.) Miller
- *Ranunculus weyleri Mares

RESEDACEAE

- *Reseda decursiva Forssk.

ROSACEAE

- Potentilla delphinensis Gren. & Godron

RUBIACEAE

- *Galium litorale Guss.
- *Galium viridiflorum Boiss. & Reuter

SALICACEAE

- Salix salvifolia Brot.
subsp. australis Franco

SANTALACEAE

- Thesium ebracteatum Hayne

SAXIFRAGACEAE

- Saxifraga berica (Beguinot) D. A. Webb
- Saxifraga florulenta Moretti
- Saxifraga hirculus L.
- Saxifraga tombeanensis Boiss. ex Engl.

SCROPHULARIACEAE

- Antirrhinum charidemi Lange
- Chaenorrhinum serpyllifolium (Lange) Lange
subsp. lusitanicum R. Fernandes
- *Euphrasia genargentea (Feoli) Diana
- Euphrasia marchesettii Wettst. ex Marches.
- Linaria algarviana Chav.
- Linaria coutinhoi Valdés
- *Linaria ficalhoana Rouy
- Linaria flava (Poiret) Desf.
- *Linaria hellenica Turrill
- *Linaria ricardoi Cout.
- *Linaria tursica B. Valdes & Cabezudo
- Linaria tonzigii Lona
- Odontites granatensis Boiss.
- Verbascum litigiosum Samp.
- Veronica micrantha Hoffmanns. & Link
- *Veronica oetaea L.-A. Gustavson

SELAGINACEAE

- *Globularia stygia Orph. ex Boiss.

SOLANACEAE

- *Atropa baetica Willk.

THYMELAEACEAE

- Daphne petraea Leybold
- *Daphne rodriguezii Texidor

ULMACEAE

Zelkova abelicea (Lam.) Boiss.

UMBELLIFERAE

- **Angelica heterocarpa* Lloyd
- Angelica palustris* (Besser) Hoffm.
- **Apium bermejoi* Llorens
- Apium repens* (Jacq.) Lag.
- Athamanta cortiana* Ferrarini
- **Bupleurum capillare* Boiss. & Heldr.
- **Bupleurum kakiskalae* Greuter
- Eryngium alpinum* L.
- **Eryngium viviparum* Gay
- **Laserpitium longiradium* Boiss.
- **Naufraga balearica* Constans & Cannon
- **Oenanthe conioides* Lange
- Petagnia saniculifolia* Guss.
- Rouya polygama* (Desf.) Coincy
- **Seseli intricatum* Boiss.
- Thorella verticillatundata* (Thore) Brig.

VALERIANACEAE

Centranthus trinervis (Viv.) Beguinot

VIOLACEAE

- **Viola hispida* Lam.
- Viola jaubertiana* Mares & Vigineix

Lower plants

BRYOPHYTA

- Bruchia vogesiaca* Schwaegr. (o)
- **Bryoerythrophyllum machadoanum* (Sergio) M. Hill (o)
- Buxbaumia viridis* (Moug. ex Lam. & DC.) Brid. ex Moug. & Nestl. (o)
- Dichelyma capillaceum* (With.) Myr. (o)
- Dicranum viride* (Sull. & Lesq.) Lindb. (o)
- Distichophyllum carinatum* Dix. & Nich. (o)
- Drepanocladus vernicosus* (Mitt.) Warnst. (o)
- Jungermannia handelii* (Schiffn.) Amak. (o)
- Mannia triandra* (Scop.) Grolle (o)
- **Marsupella profunda* Lindb. (o)
- Meesia longiseta* Hedw. (o)
- Nothothylas orbicularis* (Schwein.) Sull. (o)
- Orthotrichum rogeri* Brid. (o)
- Petalophyllum ralfsii* Nees & Goot. ex Lehm. (o)
- Riccia breidleri* Jur. ex Steph. (o)
- Riella helicophylla* (Mont.) Hook. (o)
- Scapania massolongi* (K. Muell.) K. Muell. (o)
- Sphagnum pylaisii* Brid. (o)
- Tayloria rudolphiana* (Gasrov) B. & G. (o)

SPECIES FOR MACARONESIA

PTERIDOPHYTA

HYMENOPHYLLACEAE

Hymenophyllum maderensis Gibby & Lovis

DRYOPTERIDACEAE

- **Polystichum drepanum* (Sw.) C. Presl.

ISOETACEAE

Isoetes azorica Durieu & Paiva

MARSILIACEAE

- **Marsilea azorica* Launert & Paiva

ANGIOSPERMAE

ASCLEPIADACEAE

- Caralluma burchardii* N. E. Brown
- **Ceropegia chrysantha* Svent.

BORAGINACEAE

- Echium candicans* L. fil.
- **Echium gentianoides* Webb & Coincy
- Myosotis azorica* H. C. Watson
- Myosotis maritima* Hochst. in Seub.

CAMPANULACEAE

- **Azorina vidalii* (H. C. Watson) Feer
- Musschia aurea* (L. f.) DC.
- **Musschia wollastonii* Lowe

CAPRIFOLIACEAE

- **Sambucus palmensis* Link

CARYOPHYLLACEAE

- Spergularia azorica* (Kindb.) Lebel

CELASTRACEAE

- Maytenus umbellata* (R. Br.) Mabb.

CHENOPODIACEAE

- Beta patula* Ait.

CISTACEAE

- Cistus chinamadensis* Banares & Romero
- **Helianthemum bystropogophyllum* Svent.

COMPOSITAE

- Andryala crithmifolia* Ait.
- **Argyranthemum lidii* Humphries
- Argyranthemum thalassophyllum* (Svent.) Hump.
- Argyranthemum winterii* (Svent.) Humphries
- **Atractylis arbuscula* Svent. & Michaelis
- Atractylis preauxiana* Schultz.
- Calendula maderensis* DC.
- Cheirolophus duranii* (Burchard) Holub
- Cheirolophus ghomerytus* (Svent.) Holub
- Cheirolophus junonianus* (Svent.) Holub
- Cheirolophus massonianus* (Lowe) Hansen
- Cirsium latifolium* Lowe
- Helichrysum gossypinum* Webb
- Helichrysum oligocephala* (Svent. & Bzawm.)
- **Lactuca watsoniana* Trel.
- **Onopordum nogalesii* Svent.
- **Onopordum carduelinum* Bolle
- **Pericallis hadrosoma* Svent.
- Phagnalon benettii* Lowe
- Stemmacantha cynaroides* (Chr. Son. in Buch) Ditt
- Sventenja bupleuroides* Font Quer
- **Tanacetum ptarmiciflorum* Webb & Berth

CONVOLVULACEAE

- **Convolvulus caput-medusae* Lowe
- **Convolvulus lopez-socasii* Svent.
- **Convolvulus massonii* A. Dietr.

CRASSULACEAE

- Aeonium gomeraense* Praeger
- Aeonium saundersii* Bolle
- Aichryson dumosum* (Lowe) Praeg.
- Monanthes wildpretii* Banares & Scholz
- Sedum brissemoretii* Raymond-Hamet

CRUCIFERAE

- **Crambe arborea* Webb ex Christ
- Crambe laevigata* DC. ex Christ
- **Crambe sventenii* R. Petters ex Bramwell & Sund.
- **Parolinia schizogynoides* Svent.
- Sinapidendron rupestre* (Ait.) Lowe

CYPERACEAE

- Carex malato-belizii* Raymond

DIPSACACEAE

- Scabiosa nitens* Roemer & J. A. Schultes

ERICACEAE

- Erica scoparia* L.
- subsp. *azorica* (Hochst.) D. A. Webb

EUPHORBIACEAE

- **Euphorbia handiensis* Burchard
- Euphorbia lambii* Svent.
- Euphorbia stygiana* H. C. Watson

GERANIACEAE

- **Geranium maderense* P. F. Yeo

GRAMINEAE

- Deschampsia maderensis* (Haeck. & Born.)
- Phalaris maderensis* (Menezes) Menezes

LABIATAE

- **Sideritis cystosiphon* Svent.
- **Sideritis discolor* (Webb ex de Noe) Bolle
- Sideritis infernalis* Bolle
- Sideritis marmorea* Bolle
- Teucrium abutiloides* L'Hér
- Teucrium betonicum* L'Hér

LEGUMINOSAE

- **Anagyris latifolia* Brouss. ex Willd.
- Anthyllis lemanniana* Lowe
- **Dorycnium spectabile* Webb & Berthel
- **Lotus azoricus* P. W. Ball
- Lotus callis-viridis* D. Bramwell & D. H. Davis
- **Lotus kunkelii* (E. Chueca) D. Bramwell & al.
- **Teline rosmarinifolia* Webb & Berthel.
- **Teline salsoloides* Arco & Acebes.
- Vicia dennesiana* H. C. Watson

LILIACEAE

- **Androcymbium psammophilum* Svent.
- Scilla maderensis* Menezes
- Semele maderensis* Costa

LORANTHACEAE

- Arceuthobium azoricum* Wiens & Hawksw

MYRICACEAE

- **Myrica rivis-martinezii* Santos.

OLEACEAE

- Jasminum azoricum* L.
- Picconia azorica* (Tutin) Knobl.

ORCHIDACEAE

- Goodyera macrophylla* Lowe

PITTOSPORACEAE

- **Pittosporum coriaceum* Dryand. ex Ait.

PLANTAGINACEAE

Plantago malato-belizii Lawalree

PLUMBAGINACEAE

- **Limonium arborescens* (Brouss.) Kuntze
- Limonium dendroides* Svent.
- **Limonium spectabile* (Svent.) Kunkel & Sunding
- **Limonium sventenii* Santos & Fernandez Galvan

POLYGONACEAE

Rumex azoricus Rech. fil.

RHAMNACEAE

Frangula azorica Tutin

ROSACEAE

- **Bencomia brachystachya* Svent.
- Bencomia sphaerocarpa* Svent.
- **Chamaemeles coriacea* Lindl.
- Dendriopterium pulidoi* Svent.
- Marcetella maderensis* (Born.) Svent.
- Prunus lusitanica* L.
- subsp. *azorica* (Mouillef.) Franco
- Sorbus maderensis* (Lowe) Docle

SANTALACEAE

Kunkeliella subsucculenta Kammer

SCROPHULARIACEAE

- **Euphrasia azorica* Wats
- Euphrasia grandiflora* Hochst. ex Seub.
- **Isoplexis chalcantha* Svent. & O'Shanahan
- Isoplexis isabelliana* (Webb & Berthel.) Masferrer
- Odontites holliana* (Lowe) Benth.
- Sibthorpia peregrina* L.

SELAGINACEAE

- **Globularia ascanii* D. Bramwell & Kunkel
- **Globularia sarcophylla* Svent.

SOLANACEAE

- **Solanum lidii* Sunding

UMBELLIFERAE

Ammi trifoliatum (H. C. Watson) Trelease
Bupleurum handiense (Bolle) Kunkel
Chaerophyllum azoricum Trelease
Ferula latipinna Santos
Melanoselinum decipiens (Schrader & Wendl.) Hoffm.
Monizia edulis Lowe
Oenanthe divaricata (R. Br.) Mabb.
Sanicula azorica Guthnick ex Seub.

VIOLACEAE

Viola paradoxa Lowe

Lower plants

BRYOPHYTA

- **Echinodium spinosum* (Mitt.) Jur. (o)
- **Thamnobryum fernandesii* Sergio (o)

ANNEX III

CRITERIA FOR SELECTING SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE AND DESIGNATION AS SPECIAL AREAS OF CONSERVATION**STAGE 1: Assessment at national level of the relative importance of sites for each natural habitat type in Annex I and each species in Annex II (including priority natural habitat types and priority species)****A. Site assessment criteria for a given natural habitat type in Annex I**

- (a) Degree of representativity of the natural habitat type on the site.
- (b) Area of the site covered by the natural habitat type in relation to the total area covered by that natural habitat type within national territory.
- (c) Degree of conservation of the structure and functions of the natural habitat type concerned and restoration possibilities.
- (d) Global assessment of the value of the site for conservation of the natural habitat type concerned.

B. Site assessment criteria for a given species in Annex II

- (a) Size and density of the population of the species present on the site in relation to the populations present within national territory.
- (b) Degree of conservation of the features of the habitat which are important for the species concerned and restoration possibilities.
- (c) Degree of isolation of the population present on the site in relation to the natural range of the species.
- (d) Global assessment of the value of the site for conservation of the species concerned.

C. On the basis of these criteria, Member States will classify the sites which they propose on the national list as sites eligible for identification as sites of Community importance according to their relative value for the conservation of each natural habitat type in Annex I or each species in Annex II.**D. That list will show the sites containing the priority natural habitat types and priority species selected by the Member States on the basis of the criteria in A and B above.****STAGE 2: Assessment of the Community importance of the sites included on the national lists**

1. All the sites identified by the Member States in Stage 1 which contain priority natural habitat types and/or species will be considered as sites of Community importance.
2. The assessment of the Community importance of other sites on Member States' lists, i.e. their contribution to maintaining or re-establishing, at a favourable conservation status, a natural habitat in Annex I or a species in Annex II and/or to the coherence of Natura 2000 will take account of the following criteria:
 - (a) relative value of the site at national level;
 - (b) geographical situation of the site in relation to migration routes of species in Annex II and whether it belongs to a continuous ecosystem situated on both sides of one or more internal Community frontiers;
 - (c) total area of the site;
 - (d) number of natural habitat types in Annex I and species in Annex II present on the site;
 - (e) global ecological value of the site for the biogeographical regions concerned and/or for the whole of the territory referred to in Article 2, as regards both the characteristic of unique aspect of its features and the way they are combined.

ANNEX IV

ANIMAL AND PLANT SPECIES OF COMMUNITY INTEREST IN NEED OF STRICT PROTECTION

The species listed in this Annex are indicated:

- by the name of species or subspecies, or
- by the body of species belonging to a higher taxon or to a designated part of that taxon.

The abbreviation 'spp.' after the name of a family or genus designates all the species belonging to that family or genus.

(a) ANIMALS

VERTEBRATES

MAMMALS

INSECTIVORA

Erinaceidae

Erinaceus algirus

Soricidae

Crocidura canariensis

Talpidae

Galemys pyrenaicus

MICROCHIROPTERA

All species

RODENTIA

Gliridae

All species except *Glis glis* and *Eliomys quercinus*

Sciuridae

Citellus citellus
Sciurus anomalus

Castoridae

Castor fiber

Cricetidae

Cricetus cricetus

Microtidae

Microtus cabreræ
Microtus oeconomus arenicola

Zapodidae

Sicista betulina

Hystriidae

Hystrix cristata

CARNIVORA

Canidae

Canis lupus (Except Spanish populations north of the Duero and Greek populations north of the 39th parallel)

Ursidae

Ursus arctos

Mustelidae

Lutra lutra
Mustela lutreola

Felidae

Felis silvestris
Lynx lynx
Lynx pardina

Phocidae

Monachus monachus

ARTIODACTYLA

Cervidae

Cervus elaphus corsicanus

Bovidae

Capra aegagrus (natural populations)
Capra pyrenaica pyrenaica
Ovis ammon musimon (natural populations — Corsica and Sardinia)
Rupicapra rupicapra balcanica
Rupicapra ornata

CETACEA

All species

REPTILES

TESTUDINATA

Testudinidae

Testudo hermanni
Testudo graeca
Testudo marginata

Cheloniidae

Caretta caretta
Chelonia mydas
Lepidochelys kempii
Eretmochelys imbricata

Dermochelyidae

Dermochelys coriacea

Emydidae

Emys orbicularis
Mauremys caspica
Mauremys leprosa

SAURIA

Lacertidae

Algyroides fitzingeri
Algyroides marchi
Algyroides moreoticus
Algyroides nigropunctatus
Lacerta agilis
Lacerta bedriagae
Lacerta danfordi
Lacerta dugesi
Lacerta graeca
Lacerta horvathi
Lacerta monticola
Lacerta schreiberi
Lacerta trilineata
Lacerta viridis
Gallotia atlantica
Gallotia galloti
Gallotia galloti insulanagae
Gallotia simonyi
Gallotia stehlii
Ophisops elegans
Podarcis erhardii
Podarcis filfolensis
Podarcis hispanica atrata

Podarcis lilfordi
 Podarcis melisellensis
 Podarcis milensis
 Podarcis muralis
 Podarcis peloponnesiaca
 Podarcis pityusensis
 Podarcis sicula
 Podarcis taurica
 Podarcis tiliguerta
 Podarcis wagleriana

Scincidae

Ablepharus kitaibelli
 Chalcides bedriagai
 Chalcides occidentalis
 Chalcides ocellatus
 Chalcides sexlineatus
 Chalcides viridianus
 Ophiomorus punctatissimus

Gekkonidae

Cyrtopodion kotschy
 Phyllodactylus europaeus
 Tarentola angustimentalis
 Tarentola boettgeri
 Tarentola delalandii
 Tarentola gomerensis

Agamidae

Stellio stellio

Chamaeleontidae

Chamaeleo chamaeleon

Anguidae

Ophisaurus apodus

OPHIDIA

Colubridae

Coluber caspius
 Coluber hippocrepis
 Coluber jugularis
 Coluber laurenti
 Coluber najadum
 Coluber nummifer
 Coluber viridiflavus
 Coronella austriaca
 Eirenis modesta
 Elaphe longissima
 Elaphe quatuorlineata
 Elaphe situla
 Natrix natrix cetti
 Natrix natrix corsa
 Natrix tessellata
 Telescopus falax

Viperidae

Vipera ammodytes
 Vipera schweizeri
 Vipera seoanni (except Spanish populations)
 Vipera ursinii
 Vipera xanthina

Boidae

Eryx jaculus

AMPHIBIANS

CAUDATA

Salamandridae

Chioglossa lusitanica
 Euproctus asper
 Euproctus montanus

Euproctus platycephalus
 Salamandra atra
 Salamandra aurorae
 Salamandra lanzai
 Salamandra luschani
 Salamandrina terdigitata
 Triturus carnifex
 Triturus cristatus
 Triturus italicus
 Triturus karelinii
 Triturus marmoratus

Proteidae

Proteus anguinus

Plethodontidae

Speleomantes ambrosii
 Speleomantes flavus
 Speleomantes genei
 Speleomantes imperialis
 Speleomantes italicus
 Speleomantes supramontes

ANURA*Discoglossidae*

Bombina bombina
 Bombina variegata
 Discoglossus galganoi
 Discoglossus jeanneae
 Discoglossus montalentii
 Discoglossus pictus
 Discoglossus sardus
 Alytes cisternasii
 Alytes muletensis
 Alytes obstetricans

Ranidae

Rana arvalis
 Rana dalmatina
 Rana graeca
 Rana iberica
 Rana italica
 Rana latastei
 Rana lessonae

Pelobatidae

Pelobates cultripipes
 Pelobates fuscus
 Pelobates syriacus

Bufo

Bufo calamita
 Bufo viridis

Hylidae

Hyla arborea
 Hyla meridionalis
 Hyla sarda

FISH**ACIPENSERIFORMES***Acipenseridae*

Acipenser naccarii
 Acipenser sturio

ATHERINIFORMES*Cyprinodontidae*

Valencia hispanica

CYPRINIFORMES

Cyprinidae

Anaocypris hispanica

PERCIFORMES

Percidae

Zingel asper

SALMONIFORMES

Coregonidae

Coregonus oxyrhynchus (anadromous populations in certain sectors of the North Sea)

INVERTEBRATES

ARTHROPODS

INSECTA

Coleoptera

Buprestis splendens
Carabus olympiae
Cerambyx cerdo
Cucujus cinnaberinus
Dytiscus latissimus
Graphoderus bilineatus
Osmoderma eremita
Rosalia alpina

Lepidoptera

Apatura metis
Coenonympha hero
Coenonympha oedippus
Erebia calcaria
Erebia christi
Erebia sudetica
Eriogaster catax
Fabriciana elisa
Hypodryas maturna
Hyles hippophaes
Lopinga achine
Lycaena dispar
Maculinea arion
Maculinea nausithous
Maculinea teleius
Melanagria arge
Papilio alexanor
Papilio hospiton
Parnassius apollo
Parnassius mnemosyne
Plebicula golgus
Proserpinus proserpina
Zerynthia polyxena

Mantodea

Apteromantis aptera

Odonata

Aeshna viridis
Cordulegaster trinacriae
Gomphus graslinii
Leucorrhina albifrons
Leucorrhina caudalis
Leucorrhina pectoralis
Lindenia tetraphylla
Macromia splendens
Ophiogomphus cecilia
Oxygastra curtisii
Stylurus flavipes
Sympecma braueri

Orthoptera

Baetica ustulata
Saga pedo

ARACHNIDA

Araneae

Macrothele calpeiana

MOLLUSCS

GASTROPODA

Prosobranchia

Patella feruginea

Stylommatophora

Caseolus calculus
Caseolus commixta
Caseolus sphaerula
Discula leacockiana
Discula tabellata
Discula testudinalis
Discula turricula
Discus defloratus
Discus guerinianus
Elona quimperiana
Geomalacus maculosus
Geomitra moniziana
Helix subplicata
Leiostyla abbreviata
Leiostyla cassida
Leiostyla corneocostata
Leiostyla gibba
Leiostyla lamellosa

BIVALVIA

Anisomyaria

Lithophaga lithophaga
Pinna nobilis

Unionoida

Margaritifera auricularia
Unio crassus

ECHINODERMATA

Echinoidea

Centrostephanus longispinus

(b) **PLANTS**

Annex IV (b) contains all the plant species listed in Annex II (b) ⁽¹⁾ plus those mentioned below

PTERIDOPHYTA

ASPLENIACEAE

Asplenium hemionitis L.

ANGIOSPERMAE

AGAVACEAE

Dracaena draco (L.) L.

AMARYLLIDACEAE

Narcissus longispathus Pugsley
Narcissus triandrus L.

⁽¹⁾ Except bryophytes in Annex II (b).

BERBERIDACEAE*Berberis maderensis* Lowe**CAMPANULACEAE***Campanula morettiana* Reichenb.
Physoplexis comosa (L.) Schur.**CARYOPHYLLACEAE***Moehringia fontqueri* Pau**COMPOSITAE***Argyranthemum pinnatifidum* (L.f.) Lowe
subsp. *succulentum* (Lowe) C. J. Humphries
Helichrysum sibthorpii Rouy
Picris willkommii (Schultz Bip.) Nyman
Santolina elegans Boiss. ex DC.
Senecio caespitosus Brot.
Senecio lagascanus DC.
subsp. *lusitanicus* (P. Cout.) Pinto da Silva
Wagenitzia lancifolia (Sieber ex Sprengel) Dostal**CRUCIFERAE***Murbeckiella sousae* Rothm.**EUPHORBIACEAE***Euphorbia nevadensis* Boiss. & Reuter**GESNERIACEAE***Jankaea heldreichii* (Boiss.) Boiss.
Ramonda serbica Pancic**IRIDACEAE***Crocus etruscus* Parl.
Iris boissieri Henriq.
Iris marisca Ricci & Colasante**LABIATAE***Rosmarinus tomentosus* Huber-Morath & Maire
Teucrium charidemi Sandwith
Thymus capitellatus Hoffmanns. & Link
Thymus villosus L.
subsp. *villosus* L.**LILIACEAE***Androcymbium europeum* (Lange) K. Richter
Bellevalia hackelli Freyn
Colchicum corsicum Baker
Colchicum cousturieri Greuter
Fritillaria conica Rix
Fritillaria drenovskii Dogen & Stoy.
Fritillaria gussichiae (Degen & Doerfler) Rix
Fritillaria obliqua Ker-Gawl.
Fritillaria rhodocanakis Orph. ex Baker
Ornithogalum reverchonii Degen & Herv.-Bass.
Scilla beirana Samp.
Scilla odorata Link**ORCHIDACEAE***Ophrys argolica* Fleischm.
Orchis scopolorum Simsmerh.
Spiranthes aestivalis (Poiret) L. C. M. Richard**PRIMULACEAE***Androsace cylindrica* DC.
Primula glaucescens Moretti
Primula spectabilis Tratt.**RANUNCULACEAE***Aquilegia alpina* L.

SAPOTACEAE

Sideroxylon marmulano Banks ex Lowe

SAXIFRAGACEAE

Saxifraga cintrana Kuzinsky ex Willk.

Saxifraga portosanctana Boiss.

Saxifraga presolanensis Engl.

Saxifraga valdensis DC.

Saxifraga vayredana Luizet

SCROPHULARIACEAE

Antirrhinum lopesianum Rothm.

Lindernia procumbens (Krocker) Philcox

SOLANACEAE

Mandragora officinarum L.

THYMELAEACEAE

Thymelaea broterana P. Cout.

UMBELLIFERAE

Bunium brevifolium Lowe

VIOLACEAE

Viola athis W. Becker

Viola cazorlensis Gandoger

Viola delphinantha Boiss.

ANNEX V

ANIMAL AND PLANT SPECIES OF COMMUNITY INTEREST WHOSE TAKING IN THE WILD AND EXPLOITATION MAY BE SUBJECT TO MANAGEMENT MEASURES

The species listed in this Annex are indicated:

- by the name of the species or subspecies, or
- by the body of species belonging to a higher taxon or to a designated part of that taxon.

The abbreviation 'spp.' after the name of a family or genus designates all the species belonging to that family or genus.

(a) *ANIMALS**VERTEBRATES***MAMMALS****CARNIVORA***Canidae*

- Canis aureus
- Canis lupus (Spanish populations north of the Duera and Greek populations north of the 39th parallel)

Mustelidae

- Martes martes
- Mustela putorius

Phocidae

- All species not mentioned in Annex IV

Viverridae

- Genetta genetta
- Herpestes ichneumon

DUPLICIDENTATA*Leporidae*

- Lepus timidus

ARTIODACTYLA*Bovidae*

- Capra ibex
- Capra pyrenaica (except Capra pyrenaica pyrenaica)
- Rupicapra rupicapra (except Rupicapra rupicapra balcanica and rupicapra ornata)

AMPHIBIANS**ANURA***Ranidae*

- Rana esculenta
- Rana perezi
- Rana ridibunda
- Rana temporaria

FISH**PETROMYZONIFORMES***Petromyzonidae*

- Lampetra fluviatilis
- Lethenteron zanandrai

ACIPENSERIFORMES*Acipenseridae*

All species not mentioned in Annex IV

SALMONIFORMES*Salmonidae*

Thymallus thymallus

Coregonus spp. (except Coregonus oxyrhynchus — anadromous populations in certain sectors of the North Sea)

Hucho hucho

Salmo salar (only in fresh water)

Cyprinidae

Barbus spp.

PERCIFORMES*Percidae*

Gymnocephalus schraetzer

Zingel zingel

CLUPEIFORMES*Clupeidae*

Alosa spp.

SILURIFORMES*Siluridae*

Silurus arctostictus

INVERTEBRATES**COELENTERATA****CNIDARIA***Corallium rubrum***MOLLUSCA****GASTROPODA — STYLOMMATOPHORA***Helicidae*

Helix pomatia

BIVALVIA — UNIONOIDA*Margaritiferidae*

Margaritifera margaritifera

Unionidae

Microcondylaea compressa

Unio elongatulus

ANNELIDA**HIRUDINOIDEA — ARHYNCHOBDELLAE***Hirudinidae*

Hirudo medicinalis

ARTHROPODA**CRUSTACEA — DECAPODA***Astacidae*

Astacus astacus

Austropotamobius pallipes

Austropotamobius torrentium

Scyllaridae

Scyllarides latus

INSECTA — LEPIDOPTERA*Saturniidae*

Graellsia isabellae

(b) *PLANTS***ALGAE****RHODOPHYTA****CORALLINACEAE**

- Lithothamnium coralloides* Crouan frat.
Phymatholithon calcareum (Poll.) Adey & McKibbin

LICHENES**CLADONIACEAE**

- Cladonia* L. subgenus *Cladina* (Nyl.) Vain.

BRYOPHYTA**MUSCI****LEUCOBRYACEAE**

- Leucobryum glaucum* (Hedw.) Ångstr.

SPHAGNACEAE

- Sphagnum* L. spp. (except *Sphagnum pylasii* Brid.)

PTERIDOPHYTA

- Lycopodium* spp.

ANGIOSPERMAE**AMARYLLIDACEAE**

- Galanthus nivalis* L.
Narcissus bulbocodium L.
Narcissus juncifolius Lagasca

COMPOSITAE

- Arnica montana* L.
Artemisia veriantha Ten
Artemisia genipi Weber
Doronicum plantagineum L.
 subsp. *tournefortii* (Rouy) P. Cout.

CRUCIFERAE

- Alyssum pintadasilvae* Dudley.
Malcolmia lacera (L.) DC.
 subsp. *gracilima* (Samp.) Franco
Murbeckiella pinnatifida (Lam.) Rothm.
 subsp. *herminii* (Rivas-Martinez) Greuter & Burdet

GENTIANACEAE

- Gentiana lutea* L.

IRIDACEAE

- Iris lusitanica* Ker-Gawler

LABIATAE

- Teucrium salviastrum* Schreber
 subsp. *salviastrum* Schreber

LEGUMINOSAE

- Anthyllis lusitanica* Cullen & Pinto da Silva
Dorycnium pentaphyllum Scop.
 subsp. *transmontana* Franco
Ulex densus Welw. ex Webb.

LILIACEAE

- Lilium rubrum* Lmk
Ruscus aculeatus L.

PLUMBAGINACEAE

- Armeria sampaio* (Bernis) Nieto Feliner

ROSACEAE

Rubus genevieri Boreau
subsp. *herminii* (Samp.) P. Cout.

SCROPHULARIACEAE

Anarrhinum longipedicelatum R. Fernandes
Euphrasia mendonçae Samp.
Scrophularia grandiflora DC.
subsp. *grandiflora* DC.
Scrophularia berminii Hoffmanns & Link
Scrophularia sublyrata Brot.

COMPOSITAE

Leuzea rhaponticoides Graells

ANNEX VI

PROHIBITED METHODS AND MEANS OF CAPTURE AND KILLING AND MODES OF TRANSPORT**(a) Non-selective means****MAMMALS**

- Blind or mutilated animals used as live decoys
- Tape recorders
- Electrical and electronic devices capable of killing or stunning
- Artificial light sources
- Mirrors and other dazzling devices
- Devices for illuminating targets
- Sighting devices for night shooting comprising an electronic image magnifier or image converter
- Explosives
- Nets which are non-selective according to their principle or their conditions of use
- Traps which are non-selective according to their principle or their conditions of use
- Crossbows
- Poisons and poisoned or anaesthetic bait
- Gassing or smoking out
- Semi-automatic or automatic weapons with a magazine capable of holding more than two rounds of ammunition

FISH

- Poison
- Explosives

(b) Modes of transport

- Aircraft
 - Moving motor vehicles
-

Marine Nature Reserve Regulations 1995

Nature Protection

1991-11**MARINE NATURE RESERVE REGULATIONS 1995****Subsidiary
1995/143**

Regulations made under section 18(6), 19(7), 21 and 24.

MARINE NATURE RESERVE REGULATIONS 1995**(LN. 1995/143)****1.1.1996**

Amending enactments	Relevant current provisions	Commencement date
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ARRANGEMENT OF REGULATIONS.

Regulation

1. Title and Commencement.
2. Interpretation and Application.
3. Special Activity Zones.
4. Access to the marine nature reserve.
5. Wildlife Wardens.
6. Prohibition in relation to diving etc.
7. Dive and Charter Vessels.
8. Buoys.
9. Protection of sea-life.
10. Protection of Natural Heritage.
11. Conduct of Research.
12. Erection of Structures.
13. General powers in relation to permits etc..
14. Duty to carry permit.
15. Forging of permits etc..
16. Application for permits etc..
17. Duplicate permits.
18. Duration of permits etc..
19. Power to delegate.
20. Recovery of money
21. Penalties.

1991-11

Nature Protection

MARINE NATURE RESERVE REGULATIONS 1995

**Subsidiary
1995/143**

Nature Protection

1991-11

MARINE NATURE RESERVE REGULATIONS 1995**Subsidiary
1995/143****Title and Commencement.**

1. (1) These regulations may be cited as the Marine Nature Reserve Regulations 1995 and, subject to sub-regulation (2), shall come into effect on the 1st day of January 1996.

(2) Where a person has carried on in accordance with the law in effect prior to the 1st day of January 1996 an activity which, by virtue of these regulations, on or after that date may be carried on only under a permit issued, or an approval or consent given, under these regulations, he may continue to carry on that activity without a permit having been issued or an approval or consent given, as the case may be, to him until such time as a permit has been issued or approval or consent has been given to him or he has been refused a permit, approval or consent, as the case may be, provided that he has applied for the relevant permit or sought the relevant approval or consent prior to the 1st day of March 1996.

Interpretation and Application.

2.(1) In these regulations and unless the context shall otherwise require-

“animal or plant” includes any marine or land vertebrate or invertebrate animal or animal product whether living or dead, any shell, and any marine or land plant or plant product whether living or dead;

“access lane” means any area designated as such by these regulations which vessels and vehicles (other than those specifically prohibited) shall use for their access and egress from the shore according to these regulations;

“artefact” includes carvings and drawings in or on rock, carved stone, pottery shards and any part thereof, from any vessel or deposit found under the sea within the boundaries of the marine nature reserve as well as any other human-made object on land or in the sea that is of any anthropological, historical, artistic or social value;

“Authority” means the Government or such person as may be appointed by the Government from time to time to be the Authority;

“charter vessel” means any vessel whether a sail vessel or a motor vessel or an engineless vessel capable of carrying one or more persons or cargo, whether or not for reward;

“dive operator” means a person providing snorkeling or scuba diving facilities for other persons, whether or not for reward, involving entry into, or exit from the water by means of a vessel or from the shore;

MARINE NATURE RESERVE REGULATIONS 1995

**Subsidiary
1995/143**

“dive vessel” means a vessel operated by a dive operator when such vessel is actually involved in dive work, including the transportation of snorkeldivers or divers to and from the dive site;

“diver” means a person using or going equipped to use—

- (a) self contained underwater breathing apparatus, or
- (b) any form of surface demand apparatus that supplies air to a person underwater;

“engineless vessel” includes canoes, kayaks, surfboards, dinghies which are not motor vessels and any sail vessel or sea-going apparatus not fitted with an in-board or outboard engine;

“marine nature reserve means the area designated by an order under section 18(2) of the Act as a marine nature area;

“motor vessel” means anything which is mechanically propelled and is constructed or used to carry, tow or pull persons or goods by or on water, and shall include jet-skis, and any reference to a motor vessel shall include a reference to the persons or goods being carried, towed or pulled, as the case may be;

“pleasure boat” has the meaning given to that expression in section 218 of the Public Health Act;

“sail vessel” includes a wind-surfer and any vessel intended to be propelled on the water by wind;

“shoreline” means that part of the marine nature reserve comprising the foreshore immediately adjacent to the sea;

“snorkeldiver” means a person who views underwater life while breathing surface air by means of a tube;

“special activity zone” means any area within the marine nature reserve so designated under regulation 3;

“vessel” means any vessel which travels on water and includes ships, boats, dinghies, engineless vessels, motor vessels and sail vessels,

“Warden” means a Wildlife Warden appointed in respect of the marine nature reserve under section 21.

“water-ski” means a ski or ski-like apparatus used in gliding behind a powered vessel on the surface of the water and “water-skiing” shall

Nature Protection

1991-11

MARINE NATURE RESERVE REGULATIONS 1995

include the operation or use of any such apparatus whether by towing it, riding on it or howsoever.

**Subsidiary
1995/143**

- (2) Nothing in these regulations shall operate to—
- (a) restrict the movement of or activity from a vessel operated by or on behalf of the Royal Gibraltar Police, the Collector of Customs, the Services Police, the Fire Service or the Captain of the Port or to require that a permit, approval or consent have been applied for or issued or given, as the case may be.
 - (b) make unlawful anything done-
 - (i) for the purpose of securing the safety of any vessel, or preventing damage to any vessel or cargo, or saving life; or
 - (ii) more than 30 metres below the sea bed.

Special Activity Zones.

3. (1) Subject to the provisions of sub-regulation (2), where the Authority is of the opinion after consultation with the Nature Conservancy Council that any part of the marine nature reserve should be reserved for one or more special activity or activities, which term may include but is not confined to—

- (a) bathing;
- (b) access lanes;
- (c) aquatic sports either generally or by reference to a particular sport;
- (d) water-skiing; or
- (e) the anchoring or mooring of vessels,

then the Authority may, by notice in the Gazette designate such area as is specified in the notice as a Special Activity Zone for the activity or activities so specified and no person shall carry on in that Zone any activity except in accordance with the terms of any designation in operation in respect of that Zone from time to time.

(2) No designation shall be made under this regulation by the Authority in respect of any land being part of Crown Lands held in right of the Government of the United Kingdom without the consent first obtained of the Secretary of State.

Access to the marine nature reserve.

4.(1) Notwithstanding the provisions of regulation 3, the Authority may, in its discretion and for the purpose of the good management of the marine nature reserve, close or restrict access to any part of the marine nature reserve, restrict the carrying on of any activity in any part of the marine nature reserve or restrict the use of any access lanes:

Provided that such closure or restriction shall not prohibit or restrict the exercise of the right of passage of any vessel other than a pleasure boat.

(2) Where in exercise of its powers under this regulation the Authority has closed or restricted access to any part of the marine nature reserve or to any access lane or restricted the carrying on of any activity in any part of the marine nature reserve, the Authority shall give adequate notice of that closure or restriction whether by signs, buoys or otherwise, and such notice shall indicate—

- (a) the area to which the closure or restriction applies;
- (b) whether or not the area is closed or if access is restricted or the carrying on of a particular activity or particular activities is restricted, the nature of the restriction; and
- (c) the period of time for which the closure or restriction is in operation.

(3) Where, in accordance with the provisions of this regulation, the Authority has closed or restricted access to any area or access lane in the marine nature reserve or restricted the carrying on of any activity in any part of the marine nature reserve, no person shall enter in that area or into that access lane or carry on an activity, as the case may be, in contravention of the restriction, except in the exercise of the right of passage by a vessel, other than a vessel which is a pleasure boat.

Wildlife Wardens.

5.(1) Any person appointed as a Wildlife Warden in accordance with section 21 of the Act shall carry out such duties in the marine nature reserve as the Authority shall specify and shall have the power, in the marine nature reserve, to require to stop any vessel or person who it appears to the Warden has failed to comply with these regulations and to require—

- (a) where a vessel is stopped, the person who appears to the Warden to be in charge of that vessel to provide to the Warden details of the vessel including details of its ownership and registration and of the persons, including the person in charge,

Nature Protection

1991-11

MARINE NATURE RESERVE REGULATIONS 1995

on board the vessel, diving from the vessel or being towed by the vessel;

**Subsidiary
1995/143**

- (b) in any other case, that person to give to the Warden details of the person's name and address,

evidenced by, in the case of a vessel, the relevant registration documents, and in the case of any person falling within paragraph (a) or (b) the production of an identity card or passport.

(2) A Warden shall have in the marine nature reserve the powers specified in section 16 of the Act.

Prohibition in relation to diving etc.

6.(1) No person shall in the marine nature reserve carry on business as a dive operator except in accordance with a permit issued in advance to him by the Authority and "carry on business as a dive operator" shall include permitting or facilitating another person to dive or snorkel and navigating a vessel with the intention of permitting or facilitating another person to dive or snorkel.

(2) Prior to issuing any permit under this regulation, the Authority shall satisfy itself that the applicant has experience and equipment suitable for the purpose of carrying on the permitted activity in the marine nature reserve.

(3) Where a permit is issued under this regulation to a person other than an individual the permit shall specify the individuals who may carry on the business on behalf of the person and any permit shall be personal to the person and to any specified individual to whom or in respect of whom it is issued and shall not be in any respect transferable.

Dive and Charter Vessels.

7.(1) No person shall operate or be in charge of a dive vessel or a charter vessel in the marine nature reserve except in accordance with a permit issued in advance by the Authority.

(2) Prior to issuing any permit under this regulation, the Authority shall satisfy itself that the applicant has experience and equipment suitable for the purpose of operating a dive vessel or, as the case may be, a charter vessel in the marine nature reserve.

(3) Where a permit is issued under this regulation to a person Other than an individual the permit shall specify the individuals who may carry on the business on behalf of the person and any permit shall be personal to the person and to any specified individual to whom or in respect of whom it is issued and shall not be in any respect transferable.

MARINE NATURE RESERVE REGULATIONS 1995

**Subsidiary
1995/143**

- (4) A person who—
- (a) moors a dive vessel or charter vessel on anything not approved for the purpose by the Authority, or
 - (b) anchors such a vessel on anything other than a clear sandy seabed,

shall be guilty of an offence.

Buoys.

8. (1) No mooring or buoy, permanent or otherwise, shall be installed in the marine nature reserve except in accordance with the approval of the Authority, which approval shall be in writing and issued in advance of the installation or the taking of any steps in the marine nature reserve in preparation for such installation.

(2) A mooring or buoy the installation of which has not been approved by the Authority in accordance with sub-regulation (1) shall be removed by the person by whom it was installed or by such other person as the Authority shall have identified as having an interest in the mooring or buoy within 28 days of the Authority requiring that person to do so, in default of which—

- (a) the Authority may at the expense of that person remove the mooring or buoy;
- (b) the person shall be guilty of an offence.

(3) Where—

- (a) in exercise of its powers under sub-regulation (2)(a) the Authority removes a mooring or buoy, or
- (b) a person is convicted of an offence under sub-regulation (2)(b),

the mooring or buoy which the Authority has removed or in respect of which the person has been convicted, as the case may, shall be forfeit to the Authority and shall be dealt with in such manner as the Authority may in its discretion determine.

(4) Where at the effective date of these regulations a mooring or buoy is installed in the marine nature reserve and—

- (a) no application for approval has been made to the Authority by the 1st day of June 1996, or

Nature Protection

1991-11

MARINE NATURE RESERVE REGULATIONS 1995**Subsidiary
1995/143**

- (b) an application having been made, it has been refused, the owner or such other person as the Authority shall have identified by as having an interest in the mooring or buoy shall forthwith remove the mooring or buoy and in default of that person having done so the Authority may at the expense of the owner or other person required to remove the mooring or buoy remove the mooring or buoy and where in the event of the disposal by the Authority of the mooring or buoy any proceeds of sale are recovered and after having deducted therefrom its costs in connection with the removal and disposal the Authority shall account to the owner for the remaining proceeds of sale, if any.

Protection of sea-life.

9.(1) Except in accordance

- (a) with an approval given under regulation 11,
 (b) the terms of a permit issued in advance, by the Authority—

no person shall—

- (c) in the marine nature reserve—
- (i) hunt, shoot or capture any sea-living creature by any means;
 (ii) collect or use anything spontaneously produced by wild-life; or
 (iii) introduce any animal or plant which is of a kind not ordinarily resident or which is not a regular visitor to Gibraltar, as the case may be; or
- (d) subject to sub-regulation (2), take into or use in the marine nature reserve any type of firearm, air gun, spear gun, cross bow, bow and arrow or any type of weapon intended to project a missile or harpoon.

(2) Nothing in paragraph (d) of sub-regulation (1) shall affect the exercise of the right of passage by a vessel so long as any firearm, air gun, spear gun, cross bow, bow and arrow or other weapon intended to project a missile or harpoon present on a vessel exercising the right of passage shall not be used in or from the marine nature reserve.

Protection of Natural Heritage.

MARINE NATURE RESERVE REGULATIONS 1995

**Subsidiary
1995/143**

10. No person shall, except in accordance with a permit issued by the Authority, in the marine nature reserve—

- (a) take by any method any plant, or plant product;
- (b) damage, destroy or remove any deposit, artificial reef groyne, reverment wall or beach, or any part thereof that makes up the shoreline or sea-bed or is situated under the surface of the water whether in contact with the shore or offshore;
- (c) damage, destroy or remove any artefact of historic, scientific or cultural interest;
- (d) destroy, damage or injure any animal, plant or marine product;
- (e) remove sand on a regular basis or in significant quantities Or for a commercial purpose;
- (f) remove rock, coral, coral rag or any other calcareous substance;
- (g) cause anchor-damage to coral and marine structures, living or dead, and associated marine, plant and animal life;
- (h) anchor vessels greater than 60 feet in length other than in an area designated for that use under regulation 3;
- (j) engage in water-skiing in any capacity other than in an area designated for the purpose under regulation 3;
- (k) dump or deposit litter or refuse;
- (l) abandon any vehicle (including, but not limited to, a pedal cycle or a motor cycle), vessel or other object;
- (m) deposit any waste, whether toxic or otherwise;
- (n) deposit any item harmful to the natural environment or any unsightly item.

Conduct of Research.

11. Scientific study may be undertaken in the marine nature reserve only with the prior approval in writing of the Authority and subject—

- (a) to such conditions as the Authority may impose for the purpose of protecting the marine nature reserve;

Nature Protection

1991-11

MARINE NATURE RESERVE REGULATIONS 1995**Subsidiary
1995/143**

- (b) to the requirement that—
- (i) the results of such research shall be presented to the Authority; and
 - (ii) specimens may be collected only with the prior written consent of the Authority and in accordance with the terms of such consent.

Erection of Structures.

12.(1) No person shall erect whether permanently or otherwise any structure which may obstruct the visibility of the marine nature reserve or change the appearance of the marine nature reserve except with the prior written consent of the Authority and subject to such conditions as the Authority may impose for the protection of the marine nature reserve.

(2) No person shall damage or deface any structure including any natural structure in the marine nature reserve.

General powers in relation to permits etc..

13.(1) Where in these regulations the Authority has the power to issue any permit or give any approval or consent, the Authority shall also be taken to have the power to withdraw, vary or cancel such a permit, approval or consent, as the case may be.

(2) Where the Authority issues a permit or gives an approval or consent it may impose, either at the time the permit, approval or consent is issued or given, as the case may be, or during the period during which the permit, approval or consent shall be in effect or at the time of renewal of the permit, approval or consent, such conditions as it deems fit, including the payment of any fees to be paid either at the time of issue or renewal or periodically or on the happening of a specified event, and any such conditions shall be endorsed on the permit or be contained in the approval or consent.

(3) A permit may be issued by the Authority or by such person as the Authority may determine and shall be in accordance with these regulations and with such terms of general application as may from time to time be prescribed by the Authority for the purpose of protecting the marine nature reserve.

(4) A permit issued by the Authority shall be obtainable on payment of the fee determined by the Authority in respect of the issue of that permit to such persons as may be authorised by the Authority to collect such fees.

Duty to carry permit.

**Subsidiary
1995/143**

14. Every person to whom the Authority has issued a permit or given approval or consent, as the case may be, shall when in the marine nature reserve and carrying out or preparing to carry out or concluding the activity in respect of which the permit, approval or consent has been issued or given, carry the permit or evidence of the approval or consent, as the case may be, and shall, on being required so to do by a police officer, a Warden or an officer of the Authority, and whether or not in the marine nature reserve, produce the permit or the evidence, as the case may be, and in default of compliance with either requirement shall be guilty of an offence.

Forging of permits etc..

15. It shall be an offence fraudulently to imitate, alter or use or fraudulently lend or allow to be used by any other person any permit, approval or consent issued or given under these regulations.

Application for permits etc..

16.(1) Applications for any permit, approval or consent, as the case may be, provided for in these regulations shall be made to the Authority or to such person as the Authority may determine, in the form prescribed by the Authority for an initial permit, approval or consent, for any variation either by way of addition thereto, deletion therefrom or change in the terms or conditions and for renewal.

(2) The Authority may require from any person making application for a permit, approval or consent such information additional to that contained in the form of application as in the opinion of the Authority it may properly require to consider and determine the application and in the absence of such information being provided the Authority shall not be required to consider or determine the application.

Duplicate permits.

17. If a valid permit is lost or damaged the holder of that permit shall apply in writing for a duplicate permit and such permit shall be issued on payment by the holder of such fee as the Authority may deem appropriate.

Duration of permits etc..

18. (1) A permit, approval or consent shall be issued or given for and in respect of such period as the Authority shall see fit.

(2) No fee or part thereof shall be refunded in respect of any permit issued or approval or consent given whether or not the permit or the approval or consent is surrendered, revoked or suspended.

Nature Protection

1991-11

MARINE NATURE RESERVE REGULATIONS 1995Subsidiary
1995/143**Power to delegate.**

19. Nothing in these regulations shall prevent the Authority from delegating to such persons as they shall see fit such powers and duties as are conferred on the Authority by these regulations for such times and under such conditions as the Authority shall see fit.

Recovery of money

20. (1) All lees and any other charges payable under these regulations may be recovered by the Authority as a civil debtor or as a simple, contract debt in any court of competent jurisdiction.

(2) Without prejudice to the generality of subregulation (1), where any fee, or other charge payable under these regulations remains owing and unpaid, the Authority may levy distress on any article belonging to or in the possession, in the market, of the person by whom such money is payable.

(3) Where a lee or other charge, or part thereof, payable under these regulations remains unpaid 28 days after it shall have been due to be paid, any permit issued or approval or consent given and to which that fee or other charge relates shall cease without more to be valid and if any person seeks thereafter to rely on that permit, approval or consent it shall be necessary in order that he may do so for him to obtain agreement from the Authority, on payment of the moneys outstanding and such further amount, if any, as the Authority may determine, to restore the permit, approval or consent, such decision being at the discretion of the Authority.

Penalties.

21. Any person who offends against any of the provisions of these regulations shall be guilty of an offence and liable-

- (a) on summary conviction to a fine at level 4 on the standard scale and a period of imprisonment not exceeding three months; and
- (b) on conviction on indictment for a period of imprisonment not exceeding 2 years and a fine.

Marine Strategy Regulations 2011

Environment

2005-27

MARINE STRATEGY REGULATIONS 2011Subsidiary
2011/013

Subsidiary Legislation made under s. 18(c).

MARINE STRATEGY REGULATIONS 2011**(LN. 2011/013)***Commencement* **10.2.2011**

Amending enactments	Relevant current provisions	Commencement date
LN. 2014/149	rr. 2, 5(1), 10(3A), (4), (5) & 15(1A)	7.8.2014

EU Legislation/International Agreements involved:
Directive 2008/56/EC

ARRANGEMENT OF REGULATIONS**Regulation**

PART 1
Preliminary

1. Title and commencement.
2. Interpretation.
3. Scope and application of these Regulations.

PART 2
General duties

4. The competent authority.
5. Functions of the competent authority.

PART 3
Elements of the marine strategy

6. Assessment of marine waters.
7. Determination of good environmental status.
8. Environmental targets and indicators.
9. Monitoring.
10. Programme of measures.

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

11. Exceptions.
12. Identification of exceptional cases.
13. Recommendations for Community action.

PART 4
Procedural requirements

14. Notification and review.
15. Public participation and information.
16. Exchange of information, etc.
17. Relationship with Water Framework Directive.
18. Directions to, and assistance from, public authorities.
19. Guidance.

SCHEDULE 1
Qualitative descriptors for determining good environmental status

SCHEDULE 2
Competent authority

SCHEDULE 3
Indicative lists of characteristics, pressures and impacts

SCHEDULE 4
Indicative list of characteristics to be taken into account for setting
environmental targets

SCHEDULE 5
Monitoring programmes

SCHEDULE 6
Programmes of measures

Environment

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

In exercise of the powers conferred upon it by section 18(c) of the Environment Act 2005 and all other enabling powers, and for the purposes of transposing into the law of Gibraltar Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy, the Government has made the following Regulations—

PART 1
Preliminary

Title and commencement.

1. These Regulations may be cited as the Marine Strategy Regulations 2011 and come into operation on the day of publication.

Interpretation.

2.(1) In these Regulations—

“baseline” means the baseline from which the breadth of the territorial sea is measured;

“Birds Directive” means Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, as amended from time to time;

“BGTW” means British Gibraltar Territorial Waters which is the area of sea, the sea bed and subsoil within the seaward limits of the territorial sea adjacent to Gibraltar under British sovereignty and which, in accordance with the United Nations Convention on the Law of the Sea 1982, currently extends to three nautical miles and to the median line in the Bay of Gibraltar;

“coastal water” means surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial sea is measured, extending where appropriate up to the outer limit of transitional waters;

“the Commission” means the European Commission;

“competent authority” has the meaning given by regulation 4;

“the Council” means the Council of the European Union;

“criteria” means distinctive technical features that are closely linked to qualitative descriptors;

“Directive” means Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy, as amended from time to time;

“environmental status” means the overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions, including those resulting from human activities inside or outside the area concerned;

“environmental target” means a qualitative or quantitative statement on the desired condition of the different components of, and pressures and impacts on, marine waters in respect of each marine region or sub-region and such targets are established in accordance with regulation 8;

“good environmental status” means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations, that is—

- (a) the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change. Marine species and habitats are protected, human-induced decline of biodiversity is prevented and diverse biological components function in balance;
- (b) hydro-morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems as described in paragraph (a) above. Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects;

Environment

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

“groundwater” means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil;

“Habitats Directive” means Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, as amended from time to time.

“inland water” means all standing or flowing water on the surface of the land, and all groundwater on the landward side of the baseline from which the breadth of territorial sea is measured;

“marine protected area” means any geographically defined area within the marine strategy area which is subject to measures for the conservation of species or habitats;

“marine region” and “marine sub-region” means a sea region or sub-region which is identified under Article 4 of the Directive;

“marine strategy” means the strategy to be developed and implemented in respect of each marine region or sub-region concerned as laid down in Article 5 of the Directive;

“marine strategy area” has the meaning given by subregulation (3);

“marine waters” means—

- (a) waters, the seabed and subsoil on the seaward side of the baseline from which the extent of territorial sea is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights, in accordance with the United Nations Convention on the Law of the Sea 1982, and, in the case of Gibraltar, the marine waters are those waters within the marine strategy area; and
- (b) coastal waters as defined by rule 2(1) of the Public Health (Water Framework) Rules 2004, their seabed and their subsoil, in so far as particular aspects of the environmental status of the marine environment are not already addressed through those Rules or any other EU legislation;

“Maritime Administrator” means the person appointed under section 3 of the Gibraltar Merchant Shipping (Safety, etc.) Act 1993;

“pollution” means the direct or indirect introduction into the marine environment, as a result of human activity, of substances or energy,

MARINE STRATEGY REGULATIONS 2011

**Subsidiary
2011/013**

including human-induced marine underwater noise, which results or is likely to result in deleterious effects such as harm to living resources and marine ecosystems, including loss of biodiversity, hazards to human health, the hindering of marine activities, including fishing, tourism and recreation and other legitimate uses of the sea, impairment of the quality for use of sea water and reduction of amenities or, in general, impairment of the sustainable use of marine goods and services;

“Port Authority” means the Gibraltar Port Authority established by section 3 of the Gibraltar Port Authority Act 2005;

“public authority” means a public body or public officer, other than a Minister or a Government department;

“Regional Sea Convention” means any of the international conventions or international agreements together with their governing bodies established for the purpose of protecting the marine environment of the marine regions referred to in Article 4 of the Directive, such as the Convention on the Protection of the Marine Environment of the Baltic Sea, the Convention for the Protection of the Marine Environment of the North-east Atlantic and the Convention for the Marine Environment and the Coastal Region of the Mediterranean Sea;

“surface water” means inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters;

“transitional waters” means bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows;

“Water Framework Directive” means Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, as amended from time to time.

(2) Good environmental status defined in this regulation shall be determined at the level of the marine region or sub-region as referred to in Article 4 of the Directive, on the basis of the qualitative descriptors in Schedule 1; and adaptive management on the basis of the ecosystem approach shall be applied with the aim of attaining good environmental status.

Environment

MARINE STRATEGY REGULATIONS 2011Subsidiary
2011/013

(3) For the purposes of these Regulations, the “marine strategy area” means—

- (a) BGTW; and
- (b) any area of sea, the sea bed and subsoil within the limits of the exclusive economic zone adjacent to Gibraltar, when and if that zone is established.

(4) In sub-regulation (3), “sea” includes coastal water, but does not include any transitional waters.

(5) Any expression used in both these Regulations and the Directive and not otherwise defined in these Regulations has the same meaning for the purposes of these Regulations as it has for the purposes of the Directive.

Scope and application of these Regulations.

3.(1) These Regulations shall—

- (a) apply only in relation to the marine strategy area; and
- (b) where applicable, take account of the transboundary effects on the quality of the marine environment of third countries in the same marine region or sub-region as the marine strategy area.

(2) The Government and the competent authority shall, when implementing and enforcing these Regulations, take due account of the fact that BGTW forms an integral part of the Mediterranean Sea marine region and the Western Mediterranean Sea sub-region as referred to respectively in Article 4(1)(c) and Article 4(2)(b)(i) of the Directive.

(3) These Regulations shall not apply to activities the sole purpose of which is the defence or the national security of Gibraltar.

(4) The competent authority shall, however, endeavour to ensure that the activities referred to in subregulation (3) are conducted in a manner that is compatible, so far as reasonable and practicable, with the objectives of the Directive and these Regulations.

(5) These Regulations shall contribute to coherence between, and aim to ensure the integration of environmental concerns into, the different policies, agreements and enactments which have an impact on the marine environment.

PART 2

General duties

The competent authority.

4.(1) The Department of Environment of the Government is designated the competent authority for Gibraltar for the purposes of the Directive and of these Regulations, including for the cooperation and coordination referred to in Articles 5(2) and 6 of the Directive, in accordance with the fourth subparagraph of Article 7(1) of the Directive, and in Article 11 of the Directive.

(2) The competent authority shall exercise its functions under these Regulations so as to secure compliance with the requirements of the Directive, including the requirement to take necessary measures to achieve or maintain good environmental status of marine waters within the marine strategy area by 31 December 2020.

(3) The Government must ensure that the Commission is informed of any changes to the name or status of the competent authority referred to in subregulation (1) within six months of such a change coming into effect.

Functions of the competent authority.

5.(1) The competent authority shall develop a marine strategy for the marine strategy area in accordance with the plan of action set out in regulations 6(1), 7(1), 8(1), 9(1) and 10(1) in order to—

- (a) protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected; and
- (b) prevent and reduce inputs into the marine environment, with a view to phasing out pollution, so as to ensure they do not give rise to any significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.

(2) The marine strategy must apply an ecosystem-based approach to the management of human activities within the marine strategy area.

(3) The marine strategy shall consist of the elements required by regulations 6 to 10.

(4) For the purpose of this regulation, an “ecosystem-based approach” means an approach which—

Environment

MARINE STRATEGY REGULATIONS 2011

**Subsidiary
2011/013**

- (a) ensures that the collective pressure of human activities within the marine strategy area is kept within levels compatible with the achievement of good environmental status; and
- (b) does not compromise the capacity of marine ecosystems to respond to human-induced changes,

while enabling the sustainable use of marine goods and services by the present and future generations.

(5) In order to develop the marine strategy under this regulation, the competent authority shall—

- (a) prepare proposals for the establishment, determination, review or update of the monitoring programmes and the programme of measures for the marine strategy area;
- (b) collect information, including information for any review or update, to support—
 - (i) the assessment of marine waters within the marine strategy area;
 - (ii) the determination of the characteristics of good environmental status for the marine waters within the marine strategy area taking into account, where relevant, any distinct hydrological, oceanographic and biogeographic features within that area; and
 - (iii) the development of environmental targets and indicators for the marine waters within the marine strategy area taking into account, where relevant, any distinct hydrological, oceanographic and biogeographic features within that area; and
- (c) gather such other information as the competent authority may reasonably require for the purpose of securing compliance with the Directive.

(6) The competent authority shall cooperate with the competent authorities of Member States which have waters in the same marine region or sub-region as Gibraltar with a view to ensuring that the measures required to achieve the objectives of the Directive, in particular the different elements of the marine strategy, are coherent and coordinated across the common marine region or sub-region in question.

MARINE STRATEGY REGULATIONS 2011**Subsidiary
2011/013**

(7) Where the status of the sea is so critical as to require urgent action, the competent authority shall endeavour to agree, with the competent authority of any Member State which has a border with Gibraltar in the same marine region or sub-region, on a plan of action which includes—

- (a) an entry into operation of programmes of measures prior to the dates set out in regulation 10(1) and (8); and
- (b) if possible, stricter protective measures than those set out in these Regulations,

provided that such action does not prevent good environmental status from being achieved or maintained in another marine region or sub-region.

(8) Where action pursuant to subregulation (7) has been taken, the Government shall—

- (a) ensure that the Commission is informed of the revised time table; and
- (b) proceed with the plan of action accordingly.

(9) The competent authority and each public authority must, in the exercise of any of their functions in so far as they affect the marine strategy area, have regard to any marine strategy developed under this regulation.

PART 3**Elements of the marine strategy****Assessment of marine waters.**

6.(1) By 15 July 2012, the competent authority must carry out an assessment of the marine waters within the marine strategy area in accordance with Article 8 of the Directive, taking account of available existing data.

(2) The assessment must, in particular, include an economic and social analysis of the use of those waters and the cost of degradation of the marine environment.

(3) The analyses referred to in paragraphs (a) and (b) of Article 8 (1) of the Directive must take into account—

- (a) elements regarding coastal, transitional and territorial waters covered by the Public Health (Water Framework) Rules 2004; and

Environment

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

- (b) or use as their basis, other relevant assessments such as those carried out jointly in the context of Regional Sea Conventions, if any, so as to produce a comprehensive assessment of the status of the marine environment.

(4) In preparing assessments under this regulation, the competent authority shall, by means of the coordination established under Articles 5 and 6 of the Directive, make every effort to ensure that—

- (a) assessment methodologies are consistent across the marine region or sub-region; and
- (b) transboundary impacts and transboundary features are taken into account.

(5) The competent authority must periodically review and update the results of the assessment required by subregulation (1), by each sixth anniversary of the date on which the assessment was published.

Determination of good environmental status.

7.(1) By 15 July 2012, the competent authority must determine the characteristics of good environmental status for the marine waters within the marine strategy area in accordance with Article 9 of the Directive.

(2) The characteristics of good environmental status must be determined on the basis of each of the qualitative descriptors listed in Schedule 1 and if the competent authority considers that it is not appropriate to use one or more of those descriptors, it shall ensure that the Commission is provided with a justification in the framework of the notification made under regulation 14(1) (b).

(3) The competent authority must take account of—

- (a) the indicative list of elements in Table 1 of Schedule 3; and
- (b) the impact of human activity in the marine strategy area, having regard to the list of pressures and impacts in Table 2 of Schedule 3.

(4) The competent authority must periodically review and update the characteristics of good environmental status determined under subregulation (1), by each sixth anniversary of the date on which the characteristics of good environmental status are determined, to ensure that those characteristics are kept up to date.

Environmental targets and indicators.

8.(1) By 15 July 2012, the competent authority must establish environmental targets and indicators for the marine waters within the marine strategy area to help secure the good environmental status of those waters, in accordance with Article 10 of the Directive.

(2) In establishing targets and indicators, the competent authority must take account of—

- (a) the indicative lists of pressure and impacts in Table 2 of Schedule 3 and the characteristics in Schedule 4; and
- (b) the continuing application of relevant existing environmental targets laid down at international, EU or domestic level in respect of the same waters, ensuring that these targets are mutually compatible and that relevant transboundary impacts and transboundary features are also taken into account, to the extent possible.

(3) The competent authority must periodically review and update the environmental targets and indicators established pursuant to subregulation (1), by each sixth anniversary of the date of the establishment of those targets and indicators, to ensure that the targets and indicators are kept up to date.

Monitoring.

9.(1) By 15 July 2014, the competent authority must establish and implement a programme for monitoring the environmental status of the marine waters within the marine strategy area, in accordance with Article 11 of the Directive.

(2) The competent authority must establish and implement the monitoring programme—

- (a) on the basis of the indicative lists of elements in Schedule 3;
- (b) on the basis of the requirements in Schedule 5; and
- (c) by reference to the environmental targets established under regulation 8.

(3) The competent authority shall ensure that the monitoring programme builds upon, and is compatible with, relevant provisions for assessment and

Environment

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

monitoring laid down by EU legislation, including the Habitats and Birds Directives, or under international agreements.

(4) The competent authority shall cooperate with competent authorities in Member States which share with Gibraltar the same marine region or sub-region with a view to ensuring that their respective monitoring programmes are compatible and consistent with the aims of coherence and coordination set out in Article 11(2) of the Directive.

(5) The competent authority must periodically review the monitoring programme by each sixth anniversary of the date on which that monitoring programme was established, to ensure that the programme is kept up to date.

Programme of measures.

10.(1) By 31 December 2015, the competent authority must publish a programme of measures necessary to achieve or maintain good environmental status for the marine waters within the marine strategy area, in accordance with Article 13 of the Directive.

(2) The competent authority must develop the programme of measures on the basis of the assessment required by regulation 6 taking account of—

- (a) the environmental targets and indicators required by regulation 8;
- (b) the control measures listed in Schedule 6;
- (c) sustainable development; and
- (d) the social and economic impact of any proposed measure.

(3) The programme of measures shall include spatial protection measures, contributing to coherent and representative networks of marine protected areas, in accordance with Article 13(4) and (5) of the Directive, and shall, in particular, adequately cover the diversity of the constituent ecosystems such as—

- (a) special areas of conservation, established pursuant to the Habitats Directive;
- (b) special protection areas, established pursuant to the Birds Directive; and
- (c) marine protected areas, as agreed by the EU or in the framework of relevant international or regional agreements.

Subsidiary
2011/013

(3A) Where it is considered that the management of human activity at European Union or international level is likely to have a significant impact on the marine environment, particularly in the areas addressed in subregulation (3), the competent authority shall individually or jointly with the competent authority of any Member State or international organisation, address the competent authority or international organisation concerned with a view to the possible consideration or adoption of measures that may be necessary in order to achieve the objectives of the Directive so as to enable the integrity, structure and functioning of ecosystems to be maintained or, where appropriate, restored.

(4) The competent authority must integrate the measures devised under this regulation into the programme of measures, taking into account relevant measures required under any applicable EU provision, any other applicable international obligation and domestic legislation, in particular, under—

- (a) the Public Health (Water Framework) Rules 2004;
- (b) the Public Health (Urban Waste Water Collection and Treatment) Regulations 1999; and
- (c) the Environment (Quality of Bathing Water) Regulations 2009.

(5) By 31 December 2013, the competent authority must publish relevant information on the areas referred to in sub-regulation (3) and (3A).

(6) The competent authority must—

- (a) include in the programme of measures a description of how the measures will be implemented and how they will contribute to the achievement of the environmental targets established under regulation 8; and
- (b) consider the implications of any programme of measures on marine waters beyond the marine strategy area in order—
 - (i) to minimise the risk of damage to those waters;
 - (ii) if possible, to have a positive impact on those waters.

(7) Before the programme of measures comes into operation, the competent authority must—

- (a) satisfy itself that the measures proposed are cost-effective and technically feasible;

Environment

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

- (b) carry out an impact assessment, including a cost-benefit analysis, of any proposed measure; and
- (c) consult the Port Authority and the Maritime Administrator on any proposed measure.

(8) The competent authority must ensure that the programme of measures is made operational by 31 December 2016 or one year after the publication of the programme of measures, whichever is earlier.

(9) The competent authority must periodically review the programme of measures required by subregulation (1), by each sixth anniversary after the date of its publication, to ensure that the programme of measures is kept up to date.

Exceptions.

11.(1) Subject to the provisions of this regulation and of regulation 12, where the competent authority has identified an exceptional case, within the meaning of paragraphs (a) to (e) of regulation 12(2), the duty under these Regulations to take the measures necessary to achieve the environmental targets or good environmental status does not apply.

(2) The Government must ensure that the Commission is notified of the justification for any such exceptional cases identified by the competent authority.

(3) The duty under these Regulations to develop or implement any element of the marine strategy, other than the assessment of marine waters, does not require the taking of any steps—

- (a) in so far as the omission to take steps would not pose a significant risk to the marine environment; or
- (b) the costs would be disproportionate taking account of the risks to the marine environment,

provided that the omission to take those steps does not result in the further deterioration of the marine waters concerned.

(4) Where the competent authority relies on either exception under subregulation (3)—

- (a) the Government must ensure that the Commission is provided with the necessary justification; and

- (b) the competent authority must avoid the achievement of good environmental status being permanently compromised.

Identification of exceptional cases.

12.(1) The competent authority may identify instances in the marine waters within the marine strategy area where, for any of the reasons listed under paragraphs (a) to (d) of subregulation (2), the environmental targets or good environmental status cannot be achieved in every aspect through measures taken by the competent authority, or, for reasons referred to in paragraph (e) of subregulation (2), they cannot be achieved within the time schedule concerned.

(2) The reasons justifying an exceptional case are—

- (a) action or inaction for which Gibraltar is not responsible;
- (b) natural causes;
- (c) force majeure;
- (d) modifications or alterations to the physical characteristics of marine waters brought about by actions taken for reasons of overriding public interest which outweigh the negative impact on the environment, including any transboundary impact; or
- (e) natural conditions which do not allow timely improvement in the status of the marine waters concerned.

(3) In respect of a case falling within subregulation (2) (b), (c) or (d), the competent authority must take such measures as it considers appropriate which aim—

- (a) to make progress towards the environmental targets established under regulation 8 to prevent further deterioration of the status of the affected marine waters; and
- (b) to mitigate the adverse impact of such a case at the level of the Mediterranean Sea marine region, the Western Mediterranean Sea sub-region or in the marine waters of a Member State.

(4) Such measures must, as far as practicable, be integrated into the programme of measures.

(5) In the situation covered by subregulation (2)(d), the competent authority must ensure that the modifications or alterations do not

Environment

MARINE STRATEGY REGULATIONS 2011

**Subsidiary
2011/013**

permanently preclude or compromise the achievement of good environmental status at the level of the Mediterranean Sea marine region, the Western Mediterranean Sea sub-region or in the marine waters of a Member State.

(6) In identifying any exceptional case as referred to in subregulation (2), the competent authority must—

- (a) consider the consequences for Member States in the Mediterranean Sea marine region or the Western Mediterranean Sea sub-region; and
- (b) clearly identify such cases in the programme of measures.

Recommendations for Community action.

13.(1) Where the competent authority identifies an issue which has an impact on the environmental status of Gibraltar's marine waters and which cannot be tackled by measures adopted by the Government, or which is linked to another EU policy or international agreement, it must ensure that the Commission is informed accordingly and is provided with a justification substantiating the competent authority's view.

(2) Where action by the EU institutions is needed, the Government must make appropriate recommendations for measures regarding the issues referred to in subregulation (1) so that the Commission and the Council may take them into account.

PART 4

Procedural requirements

Notification and review.

14.(1) The Government shall ensure that the Commission is notified of—

- (a) an assessment under regulation 6, within three months of the determination of the characteristics of good environmental status under regulation 7;
- (b) the determination of the characteristics of good environmental status under regulation 7, within three months of that determination;
- (c) the environmental targets and indicators under regulation 8, within three months of the establishment of those targets and indicators;

MARINE STRATEGY REGULATIONS 2011

**Subsidiary
2011/013**

- (d) the monitoring programme under regulation 9, within three months of its establishment;
- (e) the programme of measures under regulation 10, within three months of its publication; and
- (f) any changes made to any element of the marine strategy, within three months of the publication of any review.

(2) The Government must ensure that the Commission is provided with a brief interim report describing progress on the implementation of the programme of measures within three years of its publication and within three years of any update to that programme.

(3) The Government shall ensure that the information under subregulation (1)(e) and (f) is also notified to any Member State concerned within the same time limits.

Public participation, consultation and information.

15.(1) The competent authority shall consult the public, the Port Authority and the Maritime Administrator where it proposes to prepare, modify or review any—

- (a) assessment required by regulation 6;
- (b) determination of good environmental status required by regulation 7;
- (c) environmental targets and indicators required by regulation 8;
- (d) monitoring programme required by regulation 9; or
- (e) programme of measures required by regulation 10.

(1A) The competent authority must publish, and make available to the public for comment, summaries of the following elements of its marine strategy, or the related updates, as follows—

- (a) the initial assessment and the determination of good environmental status, as provided for in regulations 6(1) and 7(1) respectively;
- (b) the environmental targets established pursuant to regulation 8(1);

Environment

MARINE STRATEGY REGULATIONS 2011**Subsidiary
2011/013**

- (c) the monitoring programmes established pursuant to regulation 9(1);
- (d) the programmes of measures established pursuant to regulation 10(1).

(2) The competent authority must—

- (a) inform the public, the Port Authority and the Maritime Administrator as to its proposal, including a summary of the relevant element of the marine strategy mentioned in subregulation (1A), any relevant background information, and the right of the public to participate in the relevant decision-making process;
- (b) specify the means by which the public can participate in the consultation, including an address for responses, and a reasonable timescale for the consultation; and
- (c) take account of the consultation responses in making any relevant decision.

(3) The competent authority must take such steps as it considers appropriate to ensure that the proposals contained in the consultation draft are brought to the attention of the public, including any persons who are likely to be interested in, or affected by, the proposed policies.

(4) Where the competent authority takes a decision in relation to its proposal, following a consultation, it must—

- (a) inform the public, the Port Authority and the Maritime Administrator of that decision;
- (b) provide information as to the reasons and considerations on which that decision is based; and
- (c) provide a statement of the steps taken by the competent authority to comply with subregulations (1) to (4), as appropriate.

(5) With regard to access to environmental information, the Freedom of Access to Information on the Environment Regulations 2005 shall apply.

(6) The Government must, in accordance with the provisions of the Environment (Infrastructure for Spatial Information) Regulations 2010,

MARINE STRATEGY REGULATIONS 2011

**Subsidiary
2011/013**

ensure that the Commission is provided with access and use rights in respect of data and information resulting from the initial assessments made under regulation 6 and from the monitoring programme established under regulation 9.

(7) The data and information referred to in subregulation (6) must also be made available to the European Environmental Agency not later than six months after they have become available.

Exchange of information, etc.

16. The competent authority is—

- (a) responsible for receiving and transmitting requests relating to any matter concerning these Regulations; and
- (b) the contact point in Gibraltar for any international information or coordination issues.

Relationship with Water Framework Directive.

17. Nothing in these Regulations requires any action in coastal waters in so far as the objectives of the Directive are achieved by any enactment implementing the Water Framework Directive or any other EU instrument.

Directions to, and assistance from, public authorities.

18.(1) The competent authority may give directions to any public authority for the purpose of implementing the Directive.

(2) The competent authority may not give directions in relation to any decision on an application for an order granting development consent under the Town Planning Act.

(3) Any direction given under these Regulations must be in writing and may be varied or revoked by a further direction.

(4) For the purpose of this regulation, a direction—

- (a) may be of a general or specific character for the purpose of giving effect to the Directive; and
- (b) without prejudice to the generality of sub-paragraph (a), may direct a public authority to exercise or not to exercise—
 - (i) specified powers;

Environment**MARINE STRATEGY REGULATIONS 2011****Subsidiary
2011/013**

- (ii) its powers in specified circumstances; or
- (iii) its powers in a specified manner.

(5) Directions given under this regulation must be publicised in such manner as the competent authority considers appropriate for the purpose of bringing the matters to which the directions relate to the attention of persons likely to be affected by them.

(6) A public authority must comply with any direction which is given to it under this regulation.

Guidance.

19.(1) The competent authority may give guidance to any person with respect to the practical implementation of the Directive.

(2) Any person to whom guidance is given under this regulation must have regard to it.

SCHEDULE 1

Regulations 2 and 7

Qualitative descriptors for determining good environmental status

1. Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
2. Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.
3. Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
4. All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.
5. Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.
6. Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.
7. Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.
8. Concentrations of contaminants are at levels not giving rise to pollution effects.
9. Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.
10. Properties and quantities of marine litter do not cause harm to the coastal and marine environment.
11. Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.

Environment**MARINE STRATEGY REGULATIONS 2011****Subsidiary
2011/013****SCHEDULE 2**

Regulation 4(3)(a)

Competent Authority

1. Name and address of the competent authority — the official name and address of the competent authority or authorities identified.
2. Legal status of the competent authority — a brief description of the legal status of the competent authority, or authorities.
3. Responsibilities — a brief description of the legal and administrative responsibilities of the competent authority or authorities, and of its role in relation to the marine waters concerned.
4. Membership — when the competent authority acts as a coordinating body for other competent authorities, a list of these is required together with a summary of the institutional relationships established in order to ensure coordination.
5. Regional or sub-regional coordination — a summary is required of the mechanisms established in order to ensure coordination between the Member States whose marine waters fall within the same marine region or sub-region.

SCHEDULE 3

Regulations 7(3)(a), 8(2)(a), 9(2)(a)

Indicative lists of characteristics, pressures and impacts

Table 1
Characteristics

Physical chemical Features	and	<ul style="list-style-type: none"> — Topography and bathymetry of the seabed; — annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time; — spatial and temporal distribution of salinity; — spatial and temporal distribution of nutrients (DIN, TN, DIP, TP, TOC) and oxygen; — pH, pCO₂ profiles or equivalent information used to measure marine acidification.
Habitat types		<ul style="list-style-type: none"> —The predominant seabed and water column habitat type(s) with a description of the characteristic physical and chemical features, such as depth, water temperature regime, currents and other water movements, salinity, structure and substrata composition of the seabed; — identification and mapping of special habitat types, especially those recognised or identified under Community legislation (the Habitats Directive and the Birds Directive) or international conventions as being of special scientific or biodiversity interest; — habitats in areas which by virtue of their characteristics, location or strategic importance merit a particular reference. This may include areas subject to intense or specific pressures or areas which merit a specific protection regime.
Biological features		<ul style="list-style-type: none"> —A description of the biological communities associated with the predominant seabed and water

Environment

MARINE STRATEGY REGULATIONS 2011

Subsidiary
2011/013

	<p>column habitats. This would include information on the phytoplankton and zooplankton communities, including the species and seasonal and geographical variability;</p> <p>— information on angiosperms, macro-algae and invertebrate bottom fauna, including species composition, biomass and annual/seasonal variability;</p> <p>— information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations;</p> <p>— a description of the population dynamics, natural and actual range and status of species of marine mammals and reptiles occurring in the marine region or subregion;</p> <p>— a description of the population dynamics, natural and actual range and status of species of seabirds occurring in the marine region or subregion;</p> <p>— a description of the population dynamics, natural and actual range and status of other species occurring in the marine region or subregion which are the subject of Community legislation or international agreements;</p> <p>— an inventory of the temporal occurrence, abundance and spatial distribution of nonindigenous, exotic species or, where relevant, genetically distinct forms of native species, which are present in the marine region or subregion.</p>
Other features	<p>—A description of the situation with regard to chemicals, including chemicals giving rise to concern, sediment contamination, hotspots, health issues and contamination of biota (especially biota meant for human consumption);</p> <p>— a description of any other features or characteristics typical of or specific to the marine region or subregion.</p>

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Table 2
Pressure and impacts

Physical loss	<p>—Smothering (e.g. by man-made structures, disposal of dredge spoil);</p> <p>— sealing (e.g. by permanent constructions).</p>
Physical damage	<p>—Changes in siltation (e.g. by outfalls, increased run-off, dredging/disposal of dredge spoil);</p> <p>— abrasion (e.g. impact on the seabed of commercial fishing, boating, anchoring);</p> <p>— selective extraction (e.g. exploration and exploitation of living and non-living resources on seabed and subsoil).</p>
Other physical disturbance	<p>— Underwater noise (e.g. from shipping, underwater acoustic equipment);</p> <p>— marine litter.</p>
Interference with hydrological processes	<p>— Significant changes in thermal regime (e.g. by outfalls from power stations);</p> <p>— significant changes in salinity regime (e.g. by constructions impeding water movements, water abstraction).</p>
Contamination by hazardous substances	<p>— Introduction of synthetic compounds (e.g. priority substances under the Public Health (Water Framework) Rules 2004 which are relevant for the marine environment such as pesticides, antifoulants, pharmaceuticals, resulting, for example, from losses from diffuse sources, pollution by ships, atmospheric deposition and biologically active substances);</p> <p>— introduction of non-synthetic substances and compounds (e.g. heavy metals, hydrocarbons, resulting, for example, from pollution by ships and oil, gas and mineral exploration and exploitation, atmospheric deposition, riverine inputs);</p>

2005-27**Environment****MARINE STRATEGY REGULATIONS 2011****Subsidiary
2011/013**

	— introduction of radio-nuclides.
Systematic and/or intentional release of substances	— Introduction of other substances, whether solid, liquid or gas, in marine waters, resulting from their systematic and/or intentional release into the marine environment, as permitted in accordance with other Community legislation and/or international conventions.
Nutrient and organic matter enrichment	— Inputs of fertilisers and other nitrogen — and phosphorus-rich substances (e.g. from point and diffuse sources, including agriculture, aquaculture, atmospheric deposition); — inputs of organic matter (e.g. sewers, mariculture, riverine inputs).
Biological disturbance	—Introduction of microbial pathogens; — introduction of non-indigenous species and translocations; — selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing).

Indicative list of characteristics to be taken into account for setting environmental targets

1. Adequate coverage of the elements characterising marine waters under the sovereignty or jurisdiction of Member States within a marine region or subregion.
2. Need to set—
 - (a) targets establishing desired conditions based on the definition of good environmental status;
 - (b) measurable targets and associated indicators that allow for monitoring and assessment; and
 - (c) operational targets relating to concrete implementation measures to support their achievement.
3. Specification of environmental status to be achieved or maintained and formulation of that status in terms of measurable properties of the elements characterising the marine waters of a Member State within a marine region or sub-region.
4. Consistency of the set of targets; absence of conflicts between them.
5. Specification of the resources needed for the achievement of targets.
6. Formulation of targets, including possible interim targets, with a timescale for their achievement.
7. Specification of indicators intended to monitor progress and guide management decisions with a view to achieving targets.
8. Where appropriate, specification of reference points (target and limit reference points).
9. Due consideration of social and economic concerns in the setting of targets.
10. Examination of the set of environmental targets, associated indicators and limit and target reference points developed in light of the environmental objectives laid down in Article 1 of the Directive, in order to assess whether

Environment**MARINE STRATEGY REGULATIONS 2011****Subsidiary
2011/013**

the achievement of the targets would lead the marine waters falling under the sovereignty or jurisdiction of Member States within a marine region to a status matching them.

11. Compatibility of targets with objectives to which the Community and its Member States have committed themselves under relevant international and regional agreements, making use of those that are most relevant for the marine region or subregion concerned with a view to achieving the environmental objectives laid down in Article 1 of the Directive.

12. When the set of targets and indicators has been assembled, they should be examined together relative to the environmental objectives laid down in Article 1 to assess whether the achievement of the targets would lead the marine environment to a status matching them.

Monitoring programmes

1. Need to provide information for an assessment of the environmental status and for an estimate of the distance from, and progress towards, good environmental status in accordance with Schedule 3 and with the criteria and methodological standards to be defined pursuant to Article 9(3) of the Directive.
2. Need to ensure the generation of information enabling the identification of suitable indicators for the environmental targets provided for in Article 10.
3. Need to ensure the generation of information allowing the assessment of the impact of the measures referred to in Article 13 of the Directive.
4. Need to include activities to identify the cause of the change and hence the possible corrective measures that would need to be taken to restore the good environmental status, when deviations from the desired status range have been identified.
5. Need to provide information on chemical contaminants in species for human consumption from commercial fishing areas.
6. Need to include activities to confirm that the corrective measures deliver the desired changes and not any unwanted side effects.
7. Need to aggregate the information on the basis of marine regions or sub-regions in accordance with Article 4 of the Directive.
8. Need to ensure comparability of assessment approaches and methods within and between marine regions and/or sub-regions.
9. Need to develop technical specifications and standardised methods for monitoring at Community level, so as to allow comparability of information.
10. Need to ensure, as far as possible, compatibility with existing programmes developed at regional and international level with a view to fostering consistency between these programmes and avoiding duplication of effort, making use of those monitoring guidelines that are the most relevant for the marine region or subregion concerned.

Environment**MARINE STRATEGY REGULATIONS 2011****Subsidiary
2011/013**

11. Need to include, as part of the initial assessment provided for in Article 8, an assessment of major changes in the environmental conditions as well as, where necessary, new and emerging issues.

12. Need to address, as part of the initial assessment provided for in Article 8, the relevant elements listed in Schedule 3 including their natural variability and to evaluate the trends towards the achievement of the environmental targets laid down pursuant to Article 10(1) of the Directive, using, as appropriate, the indicators established and their limit or target reference points.

Programmes of measures

1. Input controls: management measures that influence the amount of a human activity that is permitted.
2. Output controls: management measures that influence the degree of perturbation of an ecosystem component that is permitted.
3. Spatial and temporal distribution controls: management measures that influence where and when an activity is allowed to occur.
4. Management coordination measures: tools to ensure that management is coordinated.
5. Measures to improve the traceability, where feasible, of marine pollution.
6. Economic incentives: management measures which make it in the economic interest of those using the marine ecosystems to act in ways which help to achieve the good environmental status objective.
7. Mitigation and remediation tools: management tools which guide human activities to restore damaged components of marine ecosystems.
8. Communication, stakeholder involvement and raising public awareness.

Marine Protection Regulations 2014

Subsidiary Legislation made under ss. 13, 18 and 24.

MARINE PROTECTION REGULATIONS 2014**NOT YET IN FORCE****(LN. 2014/180)***Commencement* **1.1.2015**

Amending enactments	Relevant current provisions	Commencement date
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ARRANGEMENT OF REGULATIONS.

Regulation

1. Title and commencement.
2. Interpretation and application.

PART I: SPECIAL PROTECTION MEASURES*Protection of the marine environment*

3. Protection of the marine environment.
4. Protection of the marine environment (additional matters).
5. Species in need of special protection measures.
6. Offences under this Part.

PART II : PERMITS

Chapter 1

List for the purpose of fishing with longlines.

7. Longlines.
8. Establishment of List A.
9. Conditions in relation to the Class A permit.

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

10. Restrictions on the use of longlines.
11. Total Allowable Catches (TACs) and Minimum Size of Catches.
12. Permissible periods for fishing with longlines.
13. Offences under this Chapter.

Chapter 2

Other fishing permits etc.

14. Other fishing permits.
15. Class B permits (fishing with rods or lines).
16. Duration and restrictions.
17. Conditions and prohibitions.
18. Limitation of Class B permits etc.
19. Class C permits (spear fishing).
20. Duration and restrictions.
21. Conditions and prohibitions.
22. Limitation of Class C permits, etc.
23. Class D permits (fishing competitions).
24. Class E permits (sports fishing operator).
25. Limitation of Class E permits, etc.
26. Offences under this Chapter.

Chapter 3

Diving permits, etc.

27. Class F permits (diving).
28. Limitation of Class F permits, etc.
29. Class G permits (dive operator).
30. Limitation of Class G permits, etc.
31. Conditions and prohibitions on Class F and Class G permits.
32. Offences under this Chapter.

Chapter 4

Dolphin tour operator permits

33. Class H permits (dolphin tour operator).
34. Limitation of Class H permits, etc.
35. Offences under this Chapter.

Chapter 5

Permits : Additional Matters

36. Approval for the conduct of research.
37. Unlawful alteration of permit / forging of permit, etc.
38. Duty to produce permit, etc.
39. Application for permit, etc.

- 40. Duplicate permits, etc.
- 41. Duration of permits, etc.

PART III : MANAGEMENT AND ENFORCEMENT

Special Zones

- 42. Designation of Special Zones.
- 43. Access to the marine nature area.

Wildlife Wardens etc.

- 44. Wildlife Wardens.
- 45. Powers of search, etc.
- 46. Prosecution of offences and contraventions.

Miscellaneous

- 47. Establishment of a Working Group.
- 48. False and misleading information.
- 49. Penalties.
- 50. Sentencing guidelines.
- 51. Removal from List A.
- 52. Provisions regarding tuna.

SCHEDULE 1

Marine Conservation Zones

SCHEDULE 2

Species in need of special protection measures

SCHEDULE 3

Cetacean Protocol

SCHEDULE 4

Minimum Fish Sizes

SCHEDULE 5

No anchoring zones in British Gibraltar Territorial Waters

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014

**Subsidiary
2014/180**

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

In exercise of the powers conferred upon it by sections 13, 18 and 24 of the Nature Protection Act 1991, and after having consulted the Nature Conservancy Council, the Government has made the following Regulations—

Title and commencement.

1.(1) These Regulations may be cited as the Marine Protection Regulations 2014.

(2) These Regulations shall come into operation on 1 January 2015.

Interpretation and application.

2.(1) In these Regulations and unless the context shall otherwise require—

“the Act” means the Nature Protection Act 1991;

“animal” shall have its zoological definition;

“the Authority” means the Minister with responsibility for the Environment or such person as may be appointed by him from time to time to be the Authority;

“BGTW” has the meaning given to it in section 2 of the Act;

“Class A permit” means a permission to fish with longlines issued in accordance with regulations 7 to 13;

“Class B permit” means a permission to fish with rods or lines issued in accordance with regulations 15 to 18;

“Class C permit” means a permission to fish with a spear gun issued in accordance with regulations 19 to 22;

“Class D permit” means a permission in relation to fishing competitions issued under regulation 23;

“Class E permit” means a permission to carry on the business of a sports fishing operator issued in accordance with regulations 24 to 26;

“Class F permit” means a permission to dive issued in accordance with regulation 27 to 28 and includes a temporary diving permit;

“Class G permit” means a permission to carry on the business of a diving operator issued in accordance with regulations 29 to 32;

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

“Class H permit” means a permission to carry on the business as a dolphin tour operator in accordance with regulations 33 to 35;

“dive operator” means a person providing snorkelling or diving facilities for other persons for reward, involving entry into, or exit from, the water by means of a vessel or from the shore;

“dive vessel” means a vessel operated by a dive operator when such vessel is actually involved in dive work, including the transportation of snorkel divers or divers to and from the dive site;

“diver” means a person using or going equipped to use—

- (a) self-contained underwater breathing apparatus, or
- (b) any form of surface demand apparatus that supplies air to a person underwater;

“dolphin tour operator” means a person facilitating access to cetaceans to other persons for reward;

“dolphin vessel” means a vessel operated by a dolphin tour operator which is engaged in seeking, approaching, or following cetaceans (including the transportation of persons to and from cetaceans);

“fishing” means the taking or killing of any wild animal and includes fishing from a vessel, spear fishing, shore-based fishing, bait collection and any other form of fishing, and the collecting or gathering of marine animals;

“List A” means the list established pursuant to regulation 8;

“Marine Conservation Zone” means an area included in Schedule 1;

“marine nature area” means the area designated by an order issued under section 18(2) of the Act as a marine nature area;

“Special Zone” means any area within the marine nature area so designated under regulation 42;

“temporary permit” means a permission authorising fishing or diving in circumstances specified in the permit during a period not exceeding 14 days (or as otherwise set out in the permit);

“warden” means a Wildlife Warden under section 44 of the Act.

(2) Nothing in these Regulations shall operate to—

- (a) restrict the movement of, or activity from, a vessel operated by or on behalf of the Royal Gibraltar Police, the Collector of Customs, the Defence Police, the Fire Service, the Ministry of Defence, the Department of the Environment, the Borders and Coastguard Agency, the Captain of the Port or a Government Department or Agency designated by the Minister or to require that a permit, approval or consent have been applied for or issued or given, as the case may be, to any of those vessels;
- (b) make unlawful anything done for the purpose of securing the safety of any vessel, or preventing damage to any vessel or cargo, or saving life.

(3) These Regulations apply to any land covered (continuously or intermittently) by waters and all of the sea within BGTW designated as a marine nature area in accordance with section 18(2) of the Act.

(4) To the extent that any fishing takes place from land, a reference in these Regulations to the marine nature area shall be deemed to include that land.

PART I : SPECIAL PROTECTION MEASURES

Protection of the marine environment

Protection of the marine environment.

3.(1) No person shall, except in accordance with a permission granted by the Authority under these Regulations, in the marine nature area—

- (a) hunt, shoot or capture any sea-living creature by any means;
- (b) collect or use anything spontaneously produced by wildlife;
- (c) introduce any animal or plant which is of a kind not ordinarily resident or which is not a regular visitor to Gibraltar, as the case may be; or
- (d) subject to subregulation (2), take into, or use in, the marine nature area any type of firearm, air gun, spear gun, cross bow, bow and arrow or any type of weapon intended to project a missile or harpoon.

(2) Nothing in paragraph (d) of subregulation (1) shall affect the exercise of the right of passage by a vessel so long as any firearm, air gun, spear gun,

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

cross bow, bow and arrow or other weapon intended to project a missile or harpoon present on a vessel exercising the right of passage shall not be used in or from the marine nature area.

Protection of the marine environment (additional matters).

4. No person shall, except in accordance with a permission granted by the Authority under these Regulations, in the marine nature area—

- (a) take by any method any plant, or plant product;
- (b) damage, destroy or remove any deposit, natural or artificial reef, revetment, sea wall or beach, or any part thereof that makes up the shoreline or sea-bed or is situated under the surface of the water whether in contact with the shore or offshore;
- (c) damage, destroy or remove any artefact of historic, scientific or cultural interest;
- (d) destroy, damage or injure any animal, plant or marine resource;
- (e) remove sand in significant quantities or for a commercial purpose;
- (f) remove rock, coral, or any other calcareous substance;
- (g) cause anchor-damage to coral and marine structures, living or dead, and associated marine, plant and animal life;
- (h) anchor vessels of more than fifteen metres other than outside an area or areas designated for that use under regulation 42;
- (i) engage in a mechanized water sport in any capacity other than outside an area or areas designated under regulation 42;
- (j) dump or deposit litter or refuse;
- (k) deposit any waste, whether toxic or otherwise;
- (l) deposit any item harmful to the natural environment or any unsightly item.

Species in need of special protection measures.

5.(1) The species listed in Schedule 2 shall be subject to the special protection measures set out in this regulation.

(2) The daily catch, retention on board, or landing of more than one specimen or more than one species listed in Schedule 2 is prohibited unless it is specifically permitted under the terms of a permit issued under these Regulations.

(3) All catches of species listed in Schedule 2 must be reported to the Authority within thirty days, in such form as the Authority requires.

(4) The Authority may, after consultation with the Nature Conservancy Council, at any time prohibit the landing or retaining on board of any species listed in Schedule 2.

Offences under this Part.

6. A person who is in breach of any obligation under regulations 3, 4 or 5, or of any condition subject to which a permission has been granted to that person, commits an offence.

PART II : PERMITS

Chapter 1

List for the purpose of fishing with longlines

Longlines.

7.(1) Fishing with longlines shall not be permissible other than subject to strict compliance with the provisions of this Chapter.

(2) A permission to fish with longlines granted pursuant to this Chapter shall be valid for a period of three years which may be renewable in the light of the available evidence on the sustainability of marine stocks within BGTW.

Establishment of List A.

8.(1) The Authority shall establish and maintain a list of vessels and owners of vessels who are permitted to fish in BGTW in accordance with regulation 7(1), hereafter "List A".

(2) Any person who wishes to appear on List A shall provide to the Authority such information as the Authority shall reasonably require in order to establish List A and such information shall include the following—

- (a) the name, date of birth, address and identity card or passport number of the owner of the vessel;

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- (b) the name and registration number of the vessel to be listed on behalf of that owner;
- (c) a photograph of the vessel to be listed on behalf of that owner;

(3) Every owner of a vessel over the age of 16 who complies with subregulation (2) and whose name is entered on List A may be granted a permit by the Authority (a “Class A permit”) that will contain the information set out in subregulation (2).

(4) The Authority shall keep the following details on List A—

- (a) the name of each vessel;
- (b) the name of the owner of each vessel;
- (c) the registration number of the Class A permit granted;
- (d) such other matters as the Authority considers ought to be entered in List A, including any of the matters set out in subregulation (2).

(5) Any changes to a permit, including any temporary restriction or other amendment, shall be entered in List A.

(6) Any person may inspect List A on payment of the prescribed fee.

(7) Subject to subregulation (8), the Minister may by order published in the Gazette limit the number of vessels appearing in List A in any period.

(8) The Minister may only make an order under subregulation (7) if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Conditions in relation to the Class A permit.

9.(1) The Class A permit is granted exclusively to the cited owner of the vessel and, subject to subregulation (3), only in relation to fishing from the vessel listed on behalf of that owner.

(2) If, during the period referred to in regulation 7(2), the owner ceases, for whatever reason, to fish with longlines, the Class A permit shall be withdrawn and, in any event, will not be renewed on the renewal date.

(3) If, during that period, the vessel listed on behalf of an owner is unavailable for a sustained period of time or is no longer fit for purpose, the

owner shall forthwith inform the Authority of the name and registration number of the replacement vessel and the owner may continue to fish with that replacement vessel.

(4) Any other conditions which the Authority may set.

Restrictions on the use of longlines.

10.(1) (1) Fishing with longlines shall be prohibited within such areas and outside such periods and times as the Minister may specify by notice issued pursuant to regulation 12(1).

(2) At no time shall any of the entrances of the Port, that is to say between the North Mole and the Detached Mole and between the South Mole and the Detached Mole, be obstructed nor will the passage of vessels be hindered in any way by vessels fishing with longlines.

(3) Fishing using longlines shall only be allowed subject to the following conditions—

- (a) the maximum number of hooks deployed from any one vessel is as follows—
 - (i) hook sizes 14-12 (maximum number 600); or
 - (ii) hook sizes 11-8 (maximum number 600); or
 - (iii) hook sizes 4-7 (maximum number 300); or
 - (iv) hook sizes 3-2 (maximum number 300);
- (b) live baiting is not used save that this condition may be waived in relation to certain species, such waiver being set out in the permit itself;
- (c) the soak time shall not exceed twelve hours;
- (d) a buoy allowing the specific identification of the vessel shall be used.

Total Allowable Catches (TACs) and Minimum Size of Catches.

11.(1) A total allowable catch (TAC) for individual species fished with longlines may be set by the Authority, after consultation with the Nature Conservancy Council, and may be amended from time to time.

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

(2) Fishing with longlines will not be allowed after such time as the Authority has determined that the TAC for that species has been reached.

(3) A monthly record of species fished with longlines shall be kept by the owner of the vessel and shall be notified to the Authority no later than 7 days after the month to which the record relates.

(4) All catches must conform to the minimum sizes stipulated in Schedule 4.

(5) Transhipment of catches between vessels is prohibited.

Permissible periods for fishing with longlines.

12.(1) Fishing with longlines shall not be permissible during such periods and times as the Minister may specify by notice in the Gazette.

(2) The Minister shall, after consultation with the Nature Conservancy Council, have the power to terminate the fishing period published in the notice in the Gazette before the termination date stated in that notice where the TAC for a particular species has been reached as stipulated in regulation 11 (2).

Offences under this Chapter.

13. A person who is in breach of any obligation under regulations 7 to 12 or of any condition subject to which a permit has been granted to that person, commits an offence.

Chapter 2
Other fishing permits etc.

Other fishing permits.

14. The Authority shall, by means of the system of permits set out in this Chapter, regulate fishing in the marine nature area with methods other than longlines.

Class B permits (fishing with rods or lines).

15.(1) Subject to the following provisions of these Regulations, a permit granted for the purposes of this regulation (a "Class B permit") shall entitle the person to whom it was granted and no others to fish with rods or lines in accordance with the terms of the permit for such period as is so specified.

(2) In the following areas a Class B permit shall only permit shore fishing during the period 15 October to 15 April—

- (a) Eastern Beach;
- (b) Catalan Bay;
- (c) Sandy Bay only on the north and south groynes, but not within the area demarcated as “No Fishing” in the Eastern Marine Conservation Zone;
- (d) Camp Bay Pier;
- (e) Keys Promenade, including the wider concrete concourse and the south and north facing revetment of that wider concourse;
- (f) The parapet wall adjacent to the car park at Little Bay Beach; and
- (g) Little Bay Beach.

(3) Notwithstanding the conditions and prohibitions contained in regulation 17, the following conditions shall apply to any person angling from the areas described in regulation 15(2)-

- (a) to remove, when leaving the area, any refuse created by the person;
- (b) to have a first aid kit available (which may be shared with others);
- (c) to exercise due caution, especially in bad weather;
- (d) to permit inspections by authorised officers of the Department of the Environment and Environmental Agency and comply with any instructions by such officer after such inspection together with all lawful instructions of the Royal Gibraltar Police; and
- (e) to be responsible for any injury or damage, howsoever caused, and not to seek to attach liability for such injury or damage to the Government.

(4) A full Class B permit shall only be issued upon proof of residency.

(5) Non-residents may apply for a temporary Class B permit.

Duration and restrictions.

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- 16.(1) A full Class B permit shall be valid for a period of 3 years.
- (2) A temporary Class B permit shall be valid for a period of 14 days.
- (3) A person may not apply for more than one temporary Class B permit per 3 calendar months.
- (4) The Authority shall ensure that no more than 20 temporary Class B permits may be in use on any given day.

Conditions and prohibitions.

17.(1) Notwithstanding the generality of regulation 15(1), a Class B permit shall not—

- (a) entitle any person to fish in a manner contrary to the provisions of section 10 of the Act;
- (b) confer any right to fish at a place or a time at which the permit holder is not otherwise entitled to fish;
- (c) authorise the erection of any structure or the use of any installation or other thing for or in connection with fishing the erection or use of which would otherwise be illegal;
- (d) allow the taking of any wild animal which is otherwise prohibited by the Act;
- (e) allow the transshipment of catches between vessels;
- (f) allow fishing in the hatched areas within the Marine Conservation Zone demarcated in Schedule 1.

(2) A Class B permit shall be subject to the following conditions—

- (a) the maximum length of a fully assembled rod must not exceed 5 metres;
- (b) no more than—
 - (i) 2 rods or lines may be used at any one time per permit holder;
 - (ii) 6 rods or lines may be used from a vessel at any one time.

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

- (c) there shall be a maximum number of 12 hooks in total with the exception of lures save that this condition may be waived in relation to certain species, such waiver being set out in the permit itself;
 - (d) all catches must conform with the minimum fish sizes stipulated in Schedule 4;
 - (e) such conditions as are imposed in relation to the collection of species in need of special protection measures pursuant to regulation 5;
 - (f) no more than 2 electric reels shall be allowed;
 - (g) a record of fish caught or taken shall be kept by the permit holder and be made available for inspection by the Authority on request;
- (3) A Class B permit may include the following further conditions—
- (a) as to the species of fish that may be fished or taken including where appropriate the dates during which fishing is prohibited or limited (and shall where appropriate include details of such prohibitions and limitations);
 - (b) as to the manner in which the person may fish including but not limited to the type of equipment which may be used and the number of hooks which may be used;
 - (c) setting a minimum landing size for fish generally or on a species by species basis;
 - (d) limiting fishing to a certain area or areas of the marine nature area;
 - (e) limiting the number of permit holders who may fish at any one time;
 - (f) notwithstanding subparagraph (a), prohibiting or otherwise limiting bait collection;
 - (g) limiting fishing to a set number of days on a weekly, monthly or annual basis or to certain days in each week, month or year;
 - (h) any other condition or conditions as may be specified after consultation with the Nature Conservancy Council.

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

(4) Persons under fourteen years of age shall be deemed to hold a valid Class B permit subject to such other conditions as the Minister deems appropriate and which are published for this purpose by notice in the Gazette.

Limitation of Class B permits etc.

18.(1) Subject to subregulation (2), and such other limits as to the number of permits as may be contained in these Regulations, the Minister may, after consultation with the Nature Conservancy Council, by notice in the Gazette—

- (a) limit the number of Class B permits of any description to be issued pursuant to regulation 15 in any year; and
- (b) provide for the selection of the applicants to whom such permits are to be issued where the number of applications exceeds the number of permits which may be granted.

(2) The Minister may exercise the power in subregulation (1) only in relation to permits for fishing of fish of any description if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Class C permits (spear fishing).

19.(1) Subject to the following provisions of these Regulations, a permit granted for the purposes of this regulation (a “Class C permit”) shall entitle the person to whom it was granted, and no others, to undertake spear fishing, in accordance with the terms of the permit, for such period as is so specified.

- (2) A full Class C permit shall only be issued upon proof of residency.
- (3) Non-residents may apply for a temporary Class C permit.
- (4) A Class C permit shall not be issued to any person under 16 years of age.

Duration and restrictions.

20.(1) A full Class C permit shall be valid for a period of 3 years.

- (2) A temporary Class C permit shall be valid for a period of 14 days.
- (3) A person may not apply for more than one temporary Class C permit per 3 calendar months.

(4) The Authority shall ensure that no more than 5 temporary Class C permits may be in use on any given day.

Conditions and prohibitions.

21.(1) Notwithstanding the generality of regulation 19(1), a Class C permit shall not—

- (a) entitle any person to fish in a manner contrary to the provisions of section 10 of the Act;
- (b) confer any right to fish at a place or a time at which the permit holder is not otherwise entitled to fish;
- (c) allow the taking of any wild animal which is otherwise prohibited by the Act;
- (d) allow the transshipment of catches between vessels;
- (e) allow spearfishing between the hours of sunset and sunrise;
- (f) allow spearfishing in the hatched areas within the Marine Conservation Zone demarcated in Schedule 1;

(2) A Class C permit shall be subject to the following conditions—

- (a) spear fishing shall be the only form of fishing permitted;
- (b) the permit shall only be issued upon receipt of evidence of a valid medical certificate and insurance cover;
- (c) such conditions as are imposed in relation to the collection of species in need of special protection measures pursuant to regulation 5;
- (d) persons engaged in spearfishing shall require a demarcation buoy and may not use breathing apparatus;
- (e) in the following areas spear fishing shall only be permitted during the period 15 October to 15 April—
 - (i) Eastern Beach;
 - (ii) Catalan Bay;
 - (iii) Sandy Bay;

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- (iv) Camp Bay;
- (v) Little Bay;
- (vi) Western Beach;
- (g) a record of fish caught or taken shall be kept by the permit holder and be made available for inspection by the Authority on request.
- (h) any other condition or conditions as may be specified after consultation with the Nature Conservancy Council.

Limitation of Class C permits etc.

22.(1) Subject to subregulation (2), and such other limits as to the number of permits as may be contained in these Regulations, the Minister may, after consultation with the Nature Conservancy Council, by order—

- (a) limit the number of Class C permits of any description to be issued pursuant to regulation 19 in any year; and
- (b) provide for the selection of the applicants to whom such permits are to be issued where the number of applications exceeds the number of permits which may be granted.

(2) The Minister may only make an order under subregulation (1) in relation to permits for fishing of fish of any description if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Class D permits (fishing competitions).

23.(1) The Authority may permit bona fide fishing competitions in the marine nature area.

(2) A permit issued under this regulation, (“a Class D permit”)—

- (a) shall be subject to the prohibitions set out in regulation 17(1)(a) to (f);
- (b) shall be subject to the prohibitions set out in regulation 17(2)(g);
- (c) may be subject to conditions set out in regulation 17(3)(a) to (h);

- (d) may be subject to additional conditions as the Authority deems appropriate.

Class E permits (sports fishing operator).

24.(1) The Authority shall by means of a system of permits regulate the carrying on of business as a sports fishing operator in the marine nature area.

(2) Subject to the following provisions of these Regulations, a permit granted for the purposes of this regulation (a “Class E permit”) shall entitle the person to whom it was granted to carry on business as a sports fishing operator in accordance with the terms of the permit for such period (up to a maximum of 12 months) as is specified in the permit.

(3) In these Regulations “carry on business as a sports fishing operator” shall include permitting or facilitating another person to fish from a vessel or from land and navigating a vessel with the intention of permitting or facilitating another person to fish.

(4) Prior to issuing a Class E permit, the Authority shall satisfy itself that the applicant is registered under Gibraltar law to provide such services and has experience and equipment suitable for the purpose of carrying on the permitted activity.

(5) Where a Class E permit is issued to a specific person the permit may specify named individuals who may carry on the business on behalf of that person, such permit is not transferable.

(6) Notwithstanding the generality of subregulation (2), a Class E permit may be subject to conditions which may include requirements with regards to—

- (a) the manner in which the business is operated;
- (b) the records to be maintained by the permit holder;
- (c) the equipment used in connection with the business (including the condition, maintenance, testing and certification of the same);
- (d) the personnel involved in the business;
- (e) health and safety issues (including accident reports and reporting, maintenance of best practice, the undertaking and recording of risk assessments, minimum levels of qualifications for operators and maximum fishing numbers);

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- (f) insurance;
 - (g) the maintenance of adequate premises;
 - (h) limiting fishing to a certain area or areas;
 - (i) where it is intended to use a vessel as part of the business, imposing conditions on such use including with regards to the mooring and anchoring of the vessel.
- (7) A Class E permit—
- (a) shall be subject to the prohibitions set out in regulation 17(1)(a) to (f);
 - (b) shall be subject to the prohibitions set out in regulation 17(2)(g);
 - (c) may be subject to conditions set out in regulation 17(3)(a) to (h);
 - (d) may be subject to such other conditions as the Authority deems appropriate.

Limitation of Class E permits etc.

25.(1) Subject to subregulation (2), the Minister may by order limit the number of Class E permits to be issued pursuant to regulation 24 in any year.

(2) The Minister may only make an order under subregulation (1) in relation to Class E permits if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Offences under this Chapter.

26. A person who is in breach of any obligation under regulations 15, 16, 17, 19, 20, 21, 23 or 24, or of any condition subject to which a permit has been granted to that person, commits an offence.

Chapter 3
Diving permits etc.

Class F permits (diving).

27.(1) The Authority shall by means of a system of permits regulate diving in the marine nature area.

(2) Subject to the following provisions of these Regulations, a permit granted for the purposes of this regulation (a “Class F permit”) shall entitle the person to whom it was granted to dive in accordance with the terms of the permit for such period as is so specified.

(3) Notwithstanding the generality of subregulation (2)–

- (a) a Class F permit may include conditions related to health and safety and require the person to be in possession of relevant insurance and qualifications;
- (b) a full Class F permit shall be valid for a period of up to 3 years and may only be issued to persons who are resident in Gibraltar or who are members of a diving club registered in Gibraltar;
- (c) a temporary Class F permit shall be valid for a period of 14 days;
- (c) a person may not apply for more than one temporary diving permit per 3 calendar months.

Limitation of Class F permits etc.

28.(1) Subject to subregulation (2), the Minister may by notice in the Gazette limit the number of Class F permits of any description to be issued pursuant to regulation 27 in any year.

(2) The Minister may exercise the power in subregulation (1) only in relation to Class F permits if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Class G permits (dive operator).

29.(1) The Authority shall by means of a system of permits regulate the carrying on of business as a dive operator in the marine nature area.

(2) Subject to the following provisions of these Regulations, a permit granted for the purposes of this regulation (a “Class G permit”) shall entitle the person to whom it was granted to carry on business as a dive operator in accordance with the terms of the permit for such period (up to a maximum of 12 months) as is specified in the permit.

(3) In these Regulations “carry on business as a dive operator” shall include permitting or facilitating another person to dive or snorkel and

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

navigating a vessel with the intention of permitting or facilitating another person to dive or snorkel from land or a vessel.

(4) Prior to issuing a Class G permit, the Authority shall satisfy itself that the applicant is registered under Gibraltar law to provide such services and has experience and equipment suitable for the purpose of carrying on the permitted activity.

(5) Where a Class G permit is issued to a specific person the permit may specify named individuals who may carry on the business on behalf of that person, such permit is not transferable.

(6) Notwithstanding the generality of subregulation (2) a Class G permit may be subject to conditions which may include requirements with regards to—

- (a) the manner in which the business is operated;
- (b) the records to be maintained by the business;
- (c) the equipment used in connection with the business (including the condition, maintenance, testing and certification of the same);
- (d) the personnel involved in the business;
- (e) health and safety issues (including accident reports and reporting, maintenance of best practice, the undertaking and recording of risk assessments, the manner of assessment of divers, minimum levels of qualifications for operators, minimum and maximum diving ages and maximum diving numbers);
- (f) insurance;
- (g) the maintenance of adequate premises;
- (h) limiting diving to a certain area;
- (i) where it is intended to use a vessel as part of the business, imposing conditions on such use including with regards to the mooring and anchoring of the vessel.

Limitation of Class G permits etc.

30.(1) Subject to subregulation (2) the Minister may by notice in the Gazette limit the number of Class G permits of any description to be issued pursuant to regulation 29 in any year.

(2) The Minister may exercise the power in subregulation (1) only in relation to Class G permits if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Conditions and prohibitions on Class F and Class G permits.

31. Notwithstanding the generality of regulations 27 and 29 no Class F or Class G permit shall—

- (a) entitle any person to kill or take a wild animal in a manner contrary to the provisions of section 10 of the Act;
- (b) confer any right to dive at a place or a time at which the permit holder is not otherwise entitled to dive;
- (c) authorise the erection of any structure or the use of any installation or other thing for or in connection with diving the erection or use of which would otherwise be illegal.

Offences under this Chapter.

32. A person who is in breach of any obligation under regulations 27, 29 or 31, or of any condition subject to which a permit has been granted to that person, commits an offence.

Chapter 4 Dolphin tour operator permits

Class H permits (dolphin tour operator).

33.(1) The Authority shall by means of a system of permits regulate the carrying on of business as a dolphin tour operator in the marine nature area.

(2) Subject to the following provisions of these Regulations, a permit granted for the purposes of this regulation (a “Class H permit”) shall entitle the person to whom it was granted to carry on business as a dolphin tour operator in accordance with the terms of the permit for such period (up to a maximum of 12 months) as is specified in the permit.

(3) In these Regulations “carry on business as a dolphin tour operator” shall include permitting or facilitating another person to observe cetaceans

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

and navigating a vessel with the intention of permitting or facilitating another person to observe cetaceans from the vessel.

(4) Prior to issuing a Class H permit, the Authority shall satisfy itself that the applicant is registered under Gibraltar law to provide such services and has experience and equipment suitable for the purpose of carrying on the permitted activity.

(5) Where a Class H permit is issued to a specific person the permit may specify named individuals who may carry on the business on behalf of that person, such permit is not transferable.

(6) Notwithstanding the generality of subregulation (2) a Class H permit may be subject to conditions which may include requirements with regards to—

- (a) the manner in which the business is operated;
- (b) the records to be maintained by the business;
- (c) the equipment used in connection with the business (including the condition, maintenance, testing and certification of the same);
- (d) the personnel involved in the business;
- (e) health and safety issues (including accident reports and reporting, maintenance of best practice, the undertaking and recording of risk assessments, minimum levels of qualifications for operators, and the maximum number of persons permitted on the vessel);
- (f) insurance;
- (g) conditions on the use of any vessel operated under the permit including with regards to the mooring and anchoring of it.

(7) The holder of a Class H permit shall comply with the Cetacean Protocol set out in Schedule 3.

Limitation of dolphin tour operator permits etc.

34.(1) Subject to subregulation (2) the Minister may by notice in the Gazette limit the number of Class H permits of any description to be issued pursuant to regulation 33 in any year.

(2) The Minister may exercise the power in subregulation (1) only in relation to Class H permits if he is satisfied that it is necessary to do so for the purposes of protecting the marine or aquatic environment and its resources from significant harm.

Offences under this Chapter.

35. A person is guilty of an offence if, in any place in which acting as a dolphin tour operator is regulated under these Regulations, he acts as a dolphin tour operator and—

- (a) is not entitled to do so by virtue of a Class H permit, or
- (b) is acting in breach of any condition of such a permit.

Chapter 5
Permits : Additional Matters

Approval for the conduct of research.

36(1). Scientific study may be undertaken in the marine nature area only with the prior approval in writing of the Authority, after consultation with the Nature Conservancy Council, and subject—

- (a) to such conditions as the Authority may impose for the purpose of protecting the marine nature area;
- (b) to the requirement that—
 - (i) the results of such research shall be presented to the Authority; and
 - (ii) specimens may be collected only with the prior written approval of the Authority and in accordance with the terms of such consent and of any permit or permits as provided for under the Act.

(2) A person who contravenes the provisions of subregulation (1), or of any condition imposed pursuant to subregulation (1), commits an offence.

Unlawful alteration of permit / forging of permit etc.

37(1) Any person who, with intent to deceive, alters a permit or approval issued or given under these Regulations is guilty of an offence.

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

(2) It shall be an offence fraudulently to imitate, alter or use or fraudulently lend or allow to be used by any other person any permit or approval given under these Regulations.

Duty to produce permit etc.

38.(1) A police officer or a warden shall, whenever they consider it necessary, require a person to whom the Authority has issued a permit or approval, as the case may be, to produce the permit or the evidence when in the marine nature area and carrying out or preparing to carry out or concluding the activity in respect of which the permit or approval has been issued or given.

(2) In the case of a person who is diving or spearfishing, subregulation (1) shall be construed as requiring the production of the permit at the first available opportunity.

(3) A person who fails to comply with a requirement in subregulation (1) or (2) shall be guilty of an offence.

Application for permit etc.

39.(1) Applications for any permit or approval provided for in these Regulations shall be made to the Authority or to such person as the Authority may determine, in the form prescribed by the Authority for an initial permit, approval or consent, for any variation either by way of addition thereto, deletion therefrom or change in the terms or conditions and for renewal.

(2) The Authority may require from any person making an application for a permit or approval such information additional to that contained in the form of application as in the opinion of the Authority it may properly require to consider and determine the application and in the absence of such information being provided the Authority shall not be required to consider or determine the application.

Duplicate permits etc.

40. If a permit or approval is lost or damaged, the holder shall apply in writing for a duplicate and, where the Authority is satisfied that the permit or approval has been lost or damaged, it shall issue a duplicate to that holder on payment by him of such fee as the Authority may deem appropriate.

Duration of permit etc.

41.(1) A permit or approval shall be issued or given for and in respect of such period as the Authority shall see fit subject to any maximum period set

out elsewhere in these Regulations with respect to any particular permit or approval.

(2) The Authority may revoke or suspend a permit or approval issued or given under these Regulations—

- (a) after consultation with the Nature Conservancy Council; or
- (b) where satisfied that there has been a breach of the permit or approval; or
- (c) where satisfied that the permit or approval holder has committed a breach of these Regulations.

(3) The Authority may, by notice to a permit holder, amend a permit issued under these Regulations after consultation with the Nature Conservancy Council.

(4) An amendment made under this regulation may—

- (a) limit the areas where fishing is permitted;
- (b) specify the species of fish or other marine organisms that may be fished or taken including where appropriate the dates during which the fishing for or taking of certain fish or other marine organisms is prohibited or limited (and shall where appropriate include details of such prohibitions and limitations).

(5) Where an amendment under subregulation (3) is made by the Authority and it is intended that the amendment affect all permits issued under these Regulations or all permits of a particular class issued under these Regulations, notice may be given to permit holders by notice published in the Gazette.

PART III : MANAGEMENT AND ENFORCEMENT.

Special Zones

Designation of Special Zones.

42.(1) Where the Authority is of the opinion after consultation with the Nature Conservancy Council that the following or any other activities should be prohibited from any part of the marine nature area—

- (a) bathing;
- (b) access lanes;

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- (c) aquatic sports either generally or by reference to a particular sport;
- (d) the anchoring or mooring of vessels,

then the Minister may, by notice in the Gazette designate such area as is specified in the notice as a Special Zone for the activity or activities so specified and no person shall carry on in that Zone any activity except in accordance with the terms of any designation in operation in respect of that Zone from time to time.

(2) Notwithstanding the generality of subregulation (1) the zones set out in Schedule 5 shall be deemed to be designated for the purposes of this regulation as Special Zones where the anchoring of vessels of more than ten metres is prohibited.

Access to the marine nature area.

43.(1) Notwithstanding the provisions of regulation 42, the Authority may, in its discretion and for the purpose of the good management of the marine nature area, close or restrict access to any part of the marine nature area, restrict the carrying on of any activity in any part of the marine nature area or restrict the use of any access lanes:

Provided that such closure or restriction shall not prohibit or restrict the exercise of the right of passage of any vessel other than a pleasure boat.

(2) Where in exercise of its powers under this regulation the Authority has closed or restricted access to any part of the marine nature area or to any access lane or restricted the carrying on of any activity in any part of the marine nature area, the Authority shall give adequate notice of that closure or restriction whether by signs, buoys or otherwise, and such notice shall indicate—

- (a) the area to which the closure or restriction applies;
- (b) whether or not the area is closed or if access is restricted or the carrying on of a particular activity or particular activities is restricted, the nature of the restriction; and
- (c) the period of time for which the closure or restriction is in operation.

(3) Where, in accordance with the provisions of this regulation, the Authority has closed or restricted access to any area or access lane in the marine nature area or restricted the carrying on of any activity in any part of

the marine nature area, no person shall enter in that area or into that access lane or carry on an activity, as the case may be, in contravention of the restriction, except in the exercise of the right of passage by a vessel other than a pleasure boat.

Wildlife Wardens etc.

Wildlife Wardens.

44.(1) Wardens shall carry out such duties in the marine nature area as the Authority shall specify and shall have the power, in the marine nature area, to require to stop any vessel or person who it appears to the warden has failed to comply with these Regulations and to require—

- (a) where a vessel is stopped, the person who appears to the warden to be in charge of that vessel to provide to the warden the permit issued to that person or details of the vessel including details of its ownership and registration and of the persons, including the person in charge, on board the vessel, diving from the vessel or being towed by the vessel;
- (b) in any other case, that person to give to the warden details of the person's name and address,

evidenced by, in the case of a vessel, the relevant registration documents, and in the case of any person falling within paragraph (a) or (b) the production of an identity card or passport.

(2) A warden shall in addition have in the marine nature area the powers specified in section 16 or any subsidiary legislation.

Powers of search etc.

45.(1) Any warden—

- (a) may examine any instrument or bait which he has reasonable cause to suspect of having been or being used or likely to be used in taking fish or other marine organism or any container which he has reasonable cause to suspect of having been used or likely to be used for holding any such instrument, bait, fish or other marine organism;
- (b) may stop and search any boat or other vessel used in fishing in a marine nature area or any vessel or vehicle which he has reasonable cause to suspect of containing—
 - (i) fish or other marine organism;

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- (ii) any such instrument, bait or container as aforesaid;
- (c) may inspect and obtain details of species, sizes and quantities of fish or other marine organisms which he has reasonable cause to suspect of having been obtained under a permit issued under these Regulations or in contravention of these Regulations;
- (d) may seize any fish or marine organism (or a sample thereof) and any instrument, vessel, vehicle or other thing used, or of being likely to be used, in contravention of these Regulations.

(2) If any person –

- (a) refuses to allow a warden to make any entry, search or examination which he is by this regulation authorised to make;
- (b) refuses to allow a warden to seize anything which he is so authorised to seize;
- (c) refuses to provide any information required to be provided to a warden under these Regulations or a permit issued under these Regulations; or
- (d) resists or obstructs a warden in any such entry, search, examination or seizure,

that person shall be guilty of an offence.

Prosecution of offences and contraventions.

46.(1) If any person is found by a warden–

- (a) taking or killing any fish or marine organism where the taking or killing constitutes an offence under these Regulations;
- (b) on or near any waters with intent to take or kill any fish or marine organism where the taking or killing would constitute an offence under these Regulations;
- (c) to have an instrument not permitted by these Regulations in his possession for the capture of any fish or marine organism, where the capture would constitute an offence under these Regulations; or

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

- (d) otherwise acting in contravention of these Regulations or a permit issued under these Regulations,

the warden may prosecute, conduct or defend before the Magistrates' Court any information, complaint, or other proceeding under these Regulations.

(2) It shall not be an objection to the competency of a warden to give evidence as a witness in any prosecution for an offence against these Regulations that the prosecution is brought at his instance or conducted by him.

*Miscellaneous***Establishment of a Working Group.**

47.(1) The Minister shall establish a Working Group for the purpose of discussing sustainable fishing in BGTW.

(2) The Minister shall convene the meetings of the Working Group and shall ensure that the Group meets on a regular basis, and at least twice a year.

(3) The Working Group shall consist of the following-

- (a) the Minister;
- (b) the Chief Executive Officer at the Government's Department of the Environment;
- (c) an Environment Officer at the Government's Department of the Environment;
- (d) a representative from the Gibraltar Ornithological and Natural History Society;
- (e) a representative from the Gibraltar Federation of Sea Anglers;
- (f) such other persons as the Minister shall designate and considers appropriate in the circumstances.

False and misleading information.

48. A person who—

- (a) with a view to obtaining a permit under these Regulations; or

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

- (b) is required or is requested to provide information under any provision in these Regulations,

provides information, whether in a document or otherwise, which to his knowledge is or may be misleading, false or deceptive in any material particular, commits an offence.

Penalties.

49.(1) Any person who contravenes any of the provisions of these Regulations shall be guilty of an offence and liable—

- (a) on summary conviction to a fine up to level 5 on the standard scale and a period of imprisonment not exceeding three months; or
- (b) on conviction on indictment for a period of imprisonment not exceeding 2 years and a fine.

(2) A court inquiring into the commission of an offence under these Regulations may, in addition to any penalty which may be imposed under subregulation (1), disqualify a person from holding a permit under these Regulations, for such period as it deems appropriate.

Sentencing guidelines.

50. In determining an appropriate sentence under regulation 50 the court shall have regard to the following matters—

- (a) the nature of the breach, in particular where the breach may be regarded as a technical infringement of limited consequence or of an administrative nature;
- (b) the steps taken to mitigate the effects of the commission of the offence;
- (c) whether the defendant's actions arose from the pursuit of a recreational or commercial activity, and if commercial, the court shall treat this as an aggravating factor;
- (d) whether the defendant acted dishonestly or tried to conceal any relevant facts or dispose of any evidence;
- (e) whether the defendant has been or is likely to be removed from List A.

Removal from List A.

51.(1) Subject to subregulation (3), the Authority may remove a person from List A where that person has failed to comply-

- (a) with the conditions of a permit; or
- (b) with any other provision in these Regulations,

and the Authority considers that it would, in the circumstances, be appropriate to do so.

(2) Subregulation (1) shall apply irrespective of whether or not such conduct also constitutes an offence.

(3) Before removal from List A the Authority shall give notice of its intention to remove that person from that list and shall allow that person to submit written reasons why he should not be removed from that list, within a period to be determined by the Authority.

(4) A person who is aggrieved by a decision to remove him from List A may appeal to the Magistrates' Court on a point of law within 21 days from the date of removal.

Provisions regarding tuna.

52. Nothing in these Regulations shall be construed as permitting the fishing, by whatever means, of the following tuna species-

Common name	scientific name
Atlantic Bluefin tuna	<i>Thunnus thynnus</i>
Albacore	<i>Thunnus alalunga</i>
Big-eye tuna	<i>Thunnus obesus.</i>

1991-11

Nature Protection

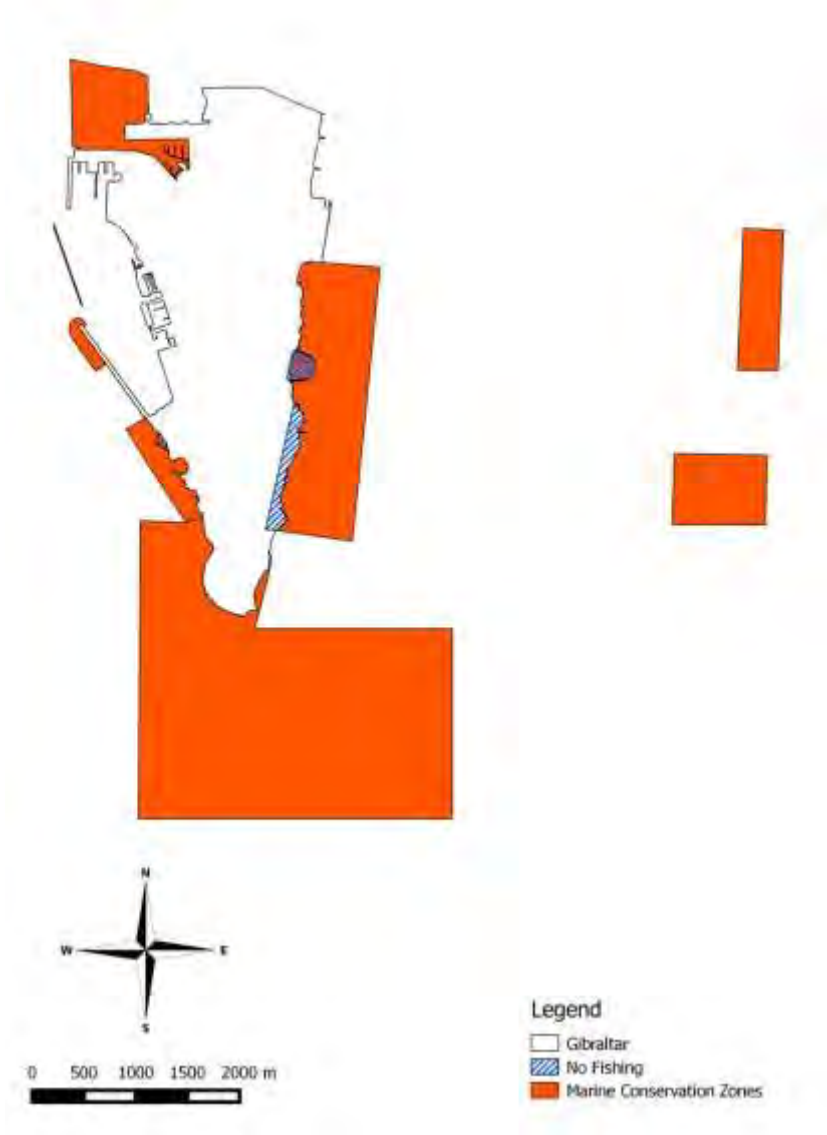
MARINE PROTECTION REGULATIONS 2014

Subsidiary
2014/180

SCHEDULE 1

Regulations 2, 15, 17 and 21

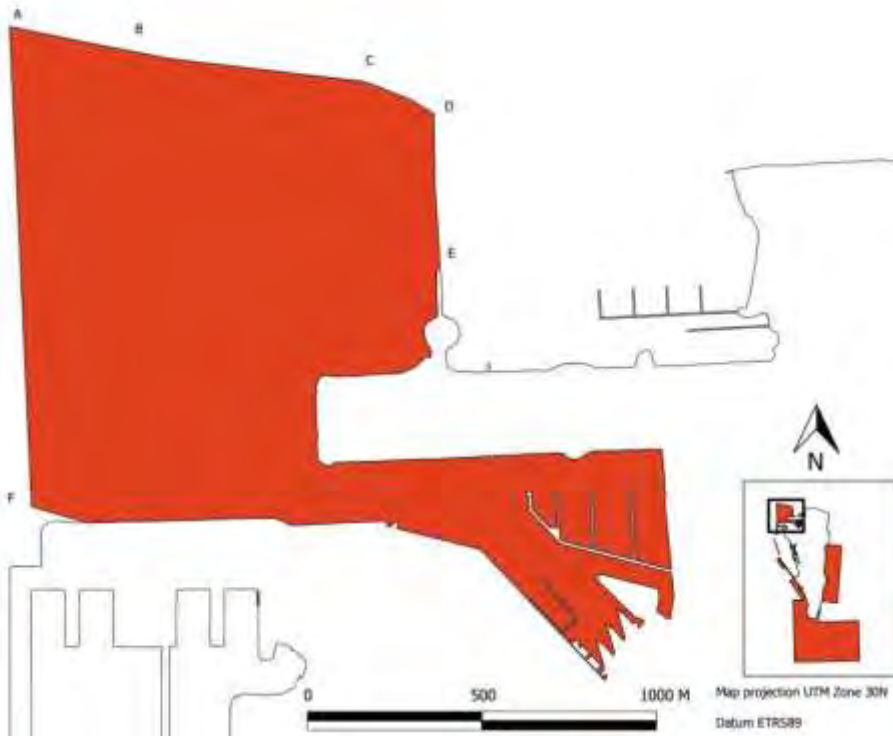
Marine Conservation Zones



Gibraltar Neanderthals

North West Marine Conservation Zone

**Subsidiary
2014/180**



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTMX	UTMY
A	-5.365969	36.157101	-05°21'57"	36°09'26"	287166.258	4003967.823
B	-5.362864	36.156594	-05°21'46"	36°09'24"	287444.351	4003904.398
C	-5.359027	36.156233	-05°21'32"	36°09'22"	287788.309	4003855.610
D	-5.357649	36.1557	-05°21'28"	36°09'21"	287910.889	4003793.405
E	-5.357521	36.153234	-05°21'27"	36°09'12"	287915.768	4003519.581
F	-5.365545	36.14947	-05°21'56"	36°08'58"	287183.639	4003119.517

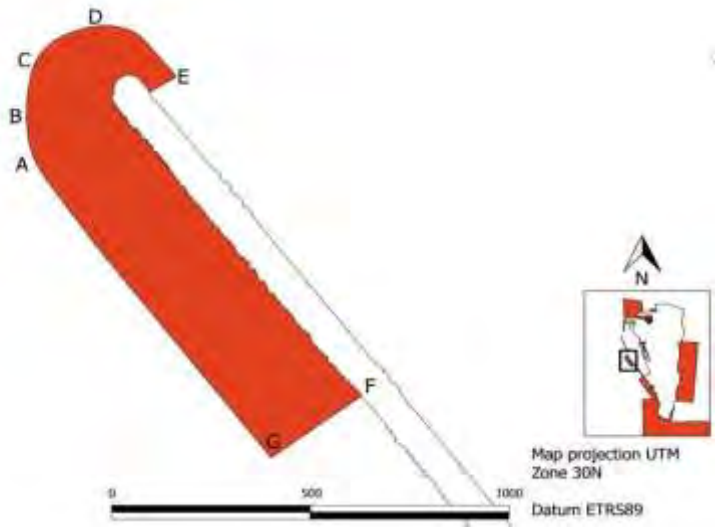
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Nature Protection

MARINE PROTECTION REGULATIONS 2014

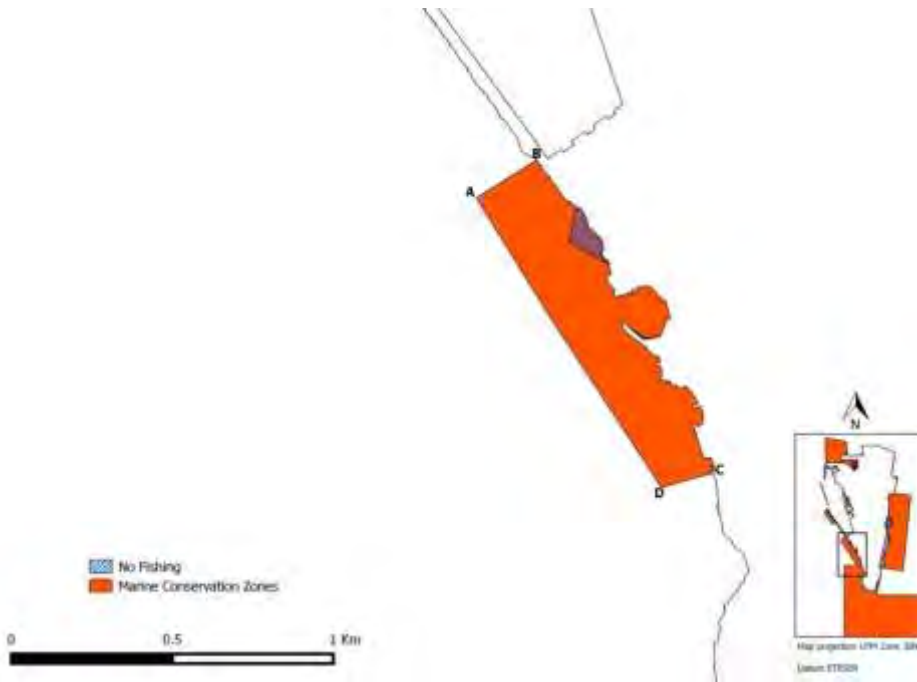
Subsidiary
2014/180

South Mole Marine Conservation Zone



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTMX	UTMY
A	-5.365257	36.133024	-05°21'55"	36°07'59"	287165.038	4001294.225
B	-5.365401	36.13351	-05°21'55"	36°08'01"	287153.451	4001348.502
C	-5.365284	36.134139	-05°21'55"	36°08'03"	287165.648	4001418.025
D	-5.364577	36.134521	-05°21'52"	36°08'04"	287230.293	4001458.885
E	-5.363585	36.133986	-05°21'49"	36°08'02"	287318.112	4001397.290
F	-5.361349	36.130578	-05°21'41"	36°07'50"	287510.216	4001014.302
G	-5.36244	36.129924	-05°21'45"	36°07'48"	287410.200	4000944.169

Rosia Marine Conservation Zone



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTMX	UTMY
A	-5.35919	36.129988	-05°21'33"	36°07'48"	287702.929	4000383.714
B	-5.357005	36.126051	-05°21'25"	36°07'34"	287888.935	4000502.635
C	-5.350764	36.117385	-05°21'03"	36°07'03"	288427.435	3999527.479
D	-5.352418	36.116967	-05°21'09"	36°07'01"	288277.411	3999484.789

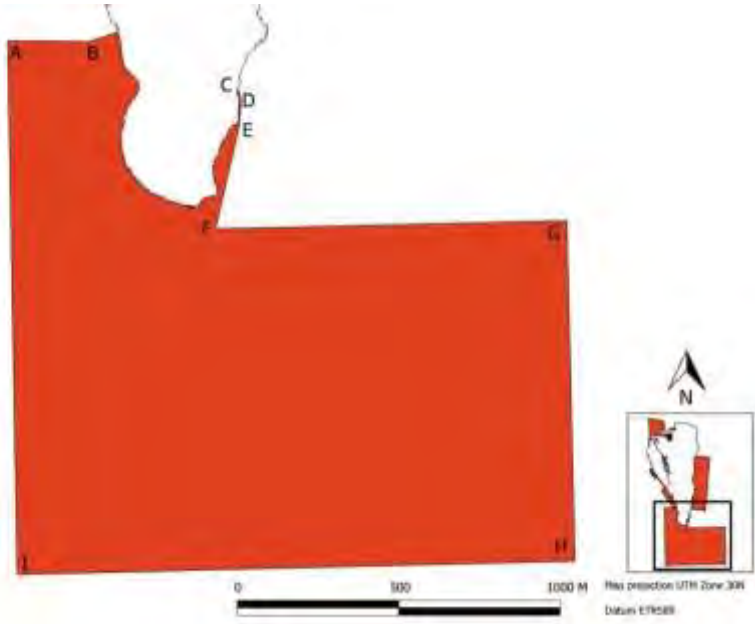
1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014

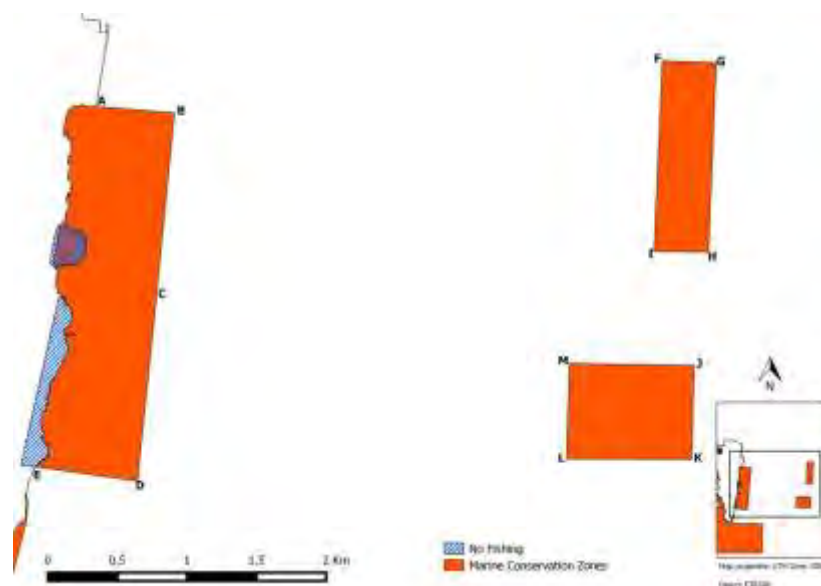
Subsidiary
2014/180

Southern Waters Marine Conservation Zone



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTMX	UTMY
A	-5.357294	36.117012	-05°21'26"	36°07'01"	287838.622	3999500.341
B	-5.352422	36.11697	-05°21'09"	36°07'01"	288277.106	3999485.094
C	-5.343398	36.114717	-05°20'36"	36°06'53"	289083.333	3999215.539
D	-5.343227	36.114182	-05°20'36"	36°06'51 "	289097.359	3999155.773
E	-5.343323	36.112855	-05°20'36"	36°06'46"	289085.162	3999008.799
F	-5.344759	36.107858	-05°20'41"	36°06'28"	288942.457	3998457.491
G	-5.323622	36.108259	-05°19'25"	36°06'30"	290846.42	3998456.271
H	-5.323094	36.091713	-05°19'23"	36°05'30"	290850.079	3996619.392
I	-5.356707	36.091034	-05°21'24"	36°05'28"	287821.546	3996616.953

Eastern Marine Conservation Zone



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTMX	UTMY
A	-5.339778	36.139958	-05°20'23"	36°08'24"	289476.688	4002008.058
B	-5.332259	36.13961	-05°19'56"	36°08'23"	290152.406	4001953.172
C	-5.333338	36.12798	-05°20'00"	36°07'41"	290024.337	4000665.161
D	-5.334518	36.115688	-05°20'04"	36°06'56"	289885.29	3999303.968
E	-5.342644	36.116453	-05°20'34"	36°06'59"	289155.905	3999406.423
F	-5.2934	36.143758	-05°17'36"	36°08'38"	293660.284	4002330.061
G	-5.289087	36.143676	-05°17'21"	36°08'37"	294048.151	4002311.766
H	-5.289354	36.131413	-05°17'22"	36°07'53"	293992.044	4000951.792
I	-5.293703	36.131373	-05°17'37"	36°07'53"	293600.518	4000956.671
J	-5.290278	36.124035	-05°17'25"	36°07'27"	293889.589	4000135.198
K	-5.290304	36.117955	-05°17'25"	36°07'05"	293871.293	3999460.7
L	-5.300313	36.117785	-05°18'01"	36°07'04"	292969.93	3999463.14
M	-5.30025	36.123986	-05°18'01"	36°07'26"	292991.884	4000151.054

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180**SCHEDULE 2****Regulation 5****Species in need of special protection measures**

The following species are subject to specific protection measures:

Xiphias gladius	(Swordfish)
Makaira spp.	(Marlins)
Tetrapturus spp.	(Spearfish)
Istiophorus albicans	(Atlantic Sailfish)
Merluccius merluccius	(European Hake)
Scyliorhinus caniculus	(Lesser spotted dogfish)
Squalus acanthias	(Spurdog)
Argyrosomus regius (L.)	(Meagre)
Homarus gammarus	(European Lobster)
Palinurus spp.	(Lobster spp.)

and such other species as the Minister may designate from time to time by notice for the purpose of this Schedule.

SCHEDULE 3**Regulation 33****Cetacean Protocol****1. Zonation.**

The Mobile Cetacean Conservation Area is defined as an imaginary cylinder of sea and air space with a 500m radius centred on the cetacean or group of cetaceans, with a height of 500m into the air and a depth of 60m under the sea. This protocol shall apply within this space.

Five zones are established within the Mobile Cetacean Conservation Area within which a specific code of conduct is set out depending on the distance from the animals under protection.

The Mobile Cetacean Conservation Area is made up of the following zones:

The Exclusion Zone has a radius of no less than 60m from the cetacean or group of cetaceans. Considering special requirements for the protection of cetaceans a larger exclusion zone may be defined by the relevant authorities.

The Restricted Access Zone is the area between the limit of the exclusion zone (60m) and the Approach Zone (300m).

The Approach Zone extends from the 300m limit of the Restricted Access Zone and the 500m limit of the Mobile Cetacean Conservation Area.

The Air Space is the space with a 500m radius centred on the cetacean or group of cetaceans and 500m into the air.

The Submarine Space is the space with a 500m radius centred on the cetacean or group of cetaceans and extending 60m beneath the surface.

2. General code of conduct.

Bathing and diving are prohibited in the Exclusion Zone.

Feeding of the animals is prohibited. No foodstuffs, drinks, waste, rubbish, litter or any other object, solid or liquid substance which may be harmful may be thrown into the sea.

Any physical contact between the animals and persons or vessels must be prevented and avoided.

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

The free movement of the cetaceans must be permitted at all times and in all directions without limiting their freedom of movement by intercepting their trajectory, cutting across their path or passing through one of their groups.

It is prohibited to separate or disperse a group of cetaceans. Nothing and no-one must ever come between an adult and its young, unless this can be justified on grounds of safety or conservation of the species.

The Mobile Cetacean Conservation Area shall be left if there is any sign of alarm, discomfort or alteration of the behaviour of a cetacean or group of cetaceans, such as sudden changes in direction or speed, sudden jumps on approach, etc.

It is forbidden to produce noise or high pitched sounds which may disturb the animals, unless this is necessary for public safety or for the protection of cetaceans. The emission of sounds under the surface in order to attract or repel cetaceans is forbidden.

In the event of a vessel carrying out non-recreational activities being approached by cetaceans, the vessel shall continue without any abrupt changes or if possible, the activity shall stop. In all cases, the vessel shall act according to reasonable criteria in the best interests of the protection and conservation of the animals.

3. Code of conduct applicable to recreational vessels observing cetaceans within the Mobile Cetacean Conservation Area.

Sonar and depth sounders shall be turned off.

Vessels shall move at a constant speed no greater than four knots, or no greater than the slowest animal in the group except in the Exclusion Zone where the rules in section 4 apply. Once the observation is over, the vessel's speed shall not change until it is outside the Mobile Cetacean Conservation Area.

All approaches to cetaceans shall be gentle and convergent with the direction of movement of cetaceans, never at right angles to the direction of movement of the animals, nor from the front or behind, and must be at an angle of at least 30 degrees of their direction of movement. During periods of observation the vessel must continue on a parallel course, without abrupt changes in direction or speed.

When more than one vessel approaches the same cetacean or group of cetaceans simultaneously, these should co-ordinate their approach and manoeuvres by radio so that there will be a minimum impact on the animals.

On turning off the engine and after starting up, it shall be maintained at neutral or out of gear for at least one minute. All changes in speed or revolutions of the engine shall always be carried out gradually and slowly.

The vessels shall never be put in reverse except in an emergency or to avoid a collision with another vessel or with a cetacean.

It is prohibited to navigate in a circle around a cetacean or group of cetaceans.

4. Specific regulations regarding recreational cetacean watching activities in the different zones:

In the Exclusion zone:

It is forbidden to enter or remain in this zone, except in emergency situations or for reasons of health and safety of persons or the conservation of species.

If the animals approach or appear within 60m of a vessel, the engine will be placed in neutral or stopped if possible.

It is forbidden to start the propeller or the engine while the animals are less than 60m of the vessel, and they may only be started up several minutes after the animals have started leaving the Exclusion Zone. In case of emergency the engine should be started slowly and any manoeuvre should be gradual and progressive, taking special care that no animals are near the propeller.

Only in the case that the cetaceans approaching the vessel are dolphins, the vessel need not be stopped. The vessel may continue moving maintaining its speed and course, without any sudden changes in speed or direction of movement.

In the Restricted Access Zone:

It is forbidden to enter this zone if the animals are feeding or moving away to maintain their distance.

It is forbidden to enter this zone if there are adults with young or young on their own.

Only one vessel may remain in this zone at any one time for a period no of more than 20 minutes. After this time the vessel must leave the Mobile Cetacean Conservation Area completely.

1991-11**Nature Protection**

MARINE PROTECTION REGULATIONS 2014**Subsidiary
2014/180**

Only two successive entries into this zone are allowed by two different vessels after which time the cetacean or group or cetaceans must not be approached for 30 minutes.

In the Approach Zone:

Only one vessel may remain in this zone awaiting entry into the Restricted Access Zone when one of the vessels then has to leave this zone on expiry of their 20 minutes. All vessels must be in continuous radio contact to co-ordinate their movements.

In the Air & Submarine Space:

Entry is prohibited into these zones.

SCHEDULE 4

Regulations 11 and 17

Minimum Fish Sizes

Common English Name	Common Spanish Name	Scientific Names	Min. Sizes (cm or Kg)
Amberjack	Pez de Limon	<i>Seriola dumerili</i>	32
Angler Fish/Monkfish	Rape	<i>Lophius spp.</i>	30
Bass/Seabass	Robalo / lubina	<i>Dicentrarchus labrax</i>	36
Bass Spotted	Baila	<i>Dicentrarchus punctatus</i>	30
Bass Stone / Wreck Fish	Cherna	<i>Polyprion americanus</i>	50
Blue Mouth	Alcantarillo / gallineta	<i>Helicolenus dactylopterus</i>	23
Bream Annular	Sargo amarillo	<i>Diplodus annularis</i>	18
Bream Black	Chopa	<i>Spondylisoma cantharus</i>	22
Bream Common Sea / Couch's	Pargo	<i>Pagrus pagrus</i>	28
Bream Dentex	Denton	<i>Dentex dentex</i>	30
Bream Gilthead	Dorada	<i>Sparus aurata</i>	32
Bream Hurta	Hurta	<i>Pagrus auriga</i>	30
Bream Pandora	Breca	<i>Pagellus erythrinus</i>	27
Bream Red	Voraz	<i>Pagellus bogaraveo</i>	21
Bream Saddled	Doblada	<i>Oblada melanura</i>	22
Bream Sama/Pink Dentex	Sama	<i>Dentex gibbosus</i>	32
Bream Saupe	Salema	<i>Sarpa salpa</i>	22
Bream Sheepshead	Sula	<i>Diplodus puntazzo</i>	24
Bream Soldier	Sargo soldado	<i>Diplodus cervinus cervinus</i>	24
Bream Striped	Herrera	<i>Lithognathus mormyrus</i>	21
Bream Two Banded	Testa negra	<i>Diplodus vulgaris</i>	22
Bream White	Sargo	<i>Diplodus sargus</i>	22
Comber	Serrano	<i>Serranus cabrilla</i>	19
Comber, Black Tailed	Serrana	<i>Serranus atricauda</i>	21
Comber, Painted	Vaquilla	<i>Serranus scriba</i>	21
Conger Eel	Safio	<i>Conger conger</i>	120
Derbio/Pompano	Palometa	<i>Trachinotus ovatus</i>	24
Dogfish Lesser Spotted	Pintaroja	<i>Scyliorhinus canicula</i>	40
Dolphin Fish/Mahi Mahi	Dorado	<i>Coryphaena hippurus</i>	32
Garfish	Aguja	<i>Belone belone</i>	32
Greater Forkbeard	Molla/Brotola	<i>Phycis blennoides</i>	25
Grouper Comb	Verdosa	<i>Mycteroperca rubra</i>	40
Grouper Dusky	Mero	<i>Epinephelus marginatus</i>	40

1991-11

Nature Protection

MARINE PROTECTION REGULATIONS 2014Subsidiary
2014/180

Grouper Pointed Nose / Golden	Abadejo	<i>Epinephelus fasciatus</i>	40
Grunt	Besugo Roncador	<i>Pomadasys incisus</i>	21
Grunt Rubber-Lipped	Borriquete	<i>Plectorhinchus mediterraneus</i>	21
Grunt Striped	Javali	<i>Parapristipoma octolineatum</i>	21
Gurnard Red	Rubio Rojo	<i>Chelidonichthys cuculus</i>	20
Gurnard Tub	Rubio	<i>Chelidonichthys lucerna</i>	20
Gurnards Streaked	Rubio	<i>Trigloporus lastoviza</i>	20
John Dory	Gallo	<i>Zeus faber</i>	30
Meagre	Corvina	<i>Argyrosomus regius</i>	50
Mediterranean Barracuda	Espeton	<i>Sphyaena sphyraena</i>	21
Mullet Flat Head/Grey	Lisa	<i>Mugil cephalus</i>	35
Mullet Golden Grey	Lisa	<i>Liza aurata</i>	35
Mullet Thick Lipped	Lisa	<i>Chezon labrosus</i>	35
Mullet, Red	Salmonete de roca	<i>Mullus surmuletus</i>	21
Mullet, Red	Salmonete de fango	<i>Mullus barbatus</i>	21
Picarel	Lunar de Cristo	<i>Spicara maena</i>	19
Puffer Fish	Pez Globo	<i>Lagocephalus lagocephalus</i>	20
Rays (except protected species)	Rayas		2kg*
Scabbard Fish	Pez Sable	<i>Lepidopus caudatus</i>	52
Scorpion Fish	Rascasio	<i>Scorpaena porcus</i>	22
Scorpion Fish Greater	Capon	<i>Scorpaena scrofa</i>	22
Spurdog	Mielga	<i>Squalus acanthias(L.)</i>	40
Stargazer	Rata	<i>Uranoscopus scaber</i>	20
Swordfish	Pez espada	<i>Xiphias gladius</i>	90**
Trigger Fish	Pez Escopeta	<i>Balistes capriscus</i>	28
Turbot	Rodaballo	<i>Scophthalmus maximus</i>	30
Weaver – Greater	Arana	<i>Trachinus draco</i>	22
Weaver – Spotted/streaked	Arana	<i>Trachinus araneus</i>	22
Weaver – Starry	Arana	<i>Trachinus radiatus</i>	22
Wrasse Ballan	Bodion tordo	<i>Labrus bergylta</i>	24
Wrasse Green	Bodion verde	<i>Labrus viridis</i>	24
Wrasse Painted	Bodion pintado	<i>Symphodus tinca</i>	24

Notes:

1. Fish to be measured from the tip of the nose to the outer most tip or edge of the tail fin.
2. *Indicates minimum weight.
3. **Excluding the sword.

Minimum Mollusc Sizes

Common English Name	Common Spanish Name	Local	Scientific Names	Axis	Minimum Size (mm or Kg)
Octopus Common	Pulpo		<i>Octopus vulgaris</i>	-	1.5kg
Grooved carpet shell	Almeja fina		<i>Venerupis decussata</i>	AP	40mm
Pullet carpet shell	Madrealmeja, Almeja babosa		<i>Venerupis corrugata</i>	AP	38mm
Banded carpet shell	Almeja chocha		<i>Politiitapes vergineus</i>	AP	35mm
Golden carpet shell	Pirulo		<i>Politiitapes aureus</i>	AP	35mm
Striped venus	Chirla		<i>Chamelea gallina</i>	AP	25mm
Surf clam	Clica		<i>Spisula solida</i>	AP	30mm
Donax	Coquina		<i>Donax trunculus</i>	AP	25mm
Smooth clam/Brown venus	Concha fina		<i>Callista chione</i>	AP	60mm
Warty venus	Escupiña grabada, Almejón, Bolo		<i>Venus verrucosa</i>	AP	50mm
-	Almeja tonta		<i>Glycimeris nummaria</i>	AP	50mm
Rayed artemis	Reloj, Medallón		<i>Dosinia exoleta</i>	AP	40mm
Razor clam	Longueirón, Navaja		<i>Solen marginatus</i>	AP	75mm
Peppery furrow shell	Coquina de fango		<i>Scrobicularia plana</i>	AP	35mm
Great scallop” or “king scallop	Vieira, Peregrina		<i>Pecten maximus</i>	AP	100mm
Common cockle	Berberecho		<i>Cerastoderma edule</i>	DV	24mm
Rough cockle	Corruco		<i>Acanthocardia tuberculata</i>	DV	45mm
Portuguese oyster	Ostión		<i>Crassostrea angulata</i>	DV	60mm
Purple dye murex	Canilla		<i>Bolinus brandaris</i>	*	70mm
-	Búsano		<i>Hexaplex trunculus</i>	*	60mm
Axis type	* From the apex to the end of siphonal channel				
AP: anteroposterior axis					
DV: dorsoventral axis					

1991-11

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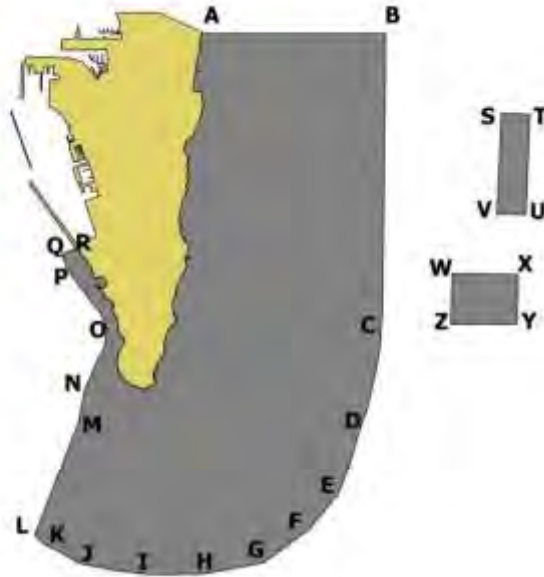
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Subsidiary
2014/180

SCHEDULE 5

Regulation 42

No Anchoring Zones in British Gibraltar Territorial Waters



Legend

- Gibraltar
- No Anchoring Zone

0 1 2 km

 Map Projection: UTM Zone 30
 Datum: ETRS89

Nature Protection

1991-11

MARINE PROTECTION REGULATIONS 2014

Subsidiary
2014/180

Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTMX	UTMY
A	-5.338927	36.152624	-05°20'20"	36°09'09"	289587.119	4003411.423
B	-5.311109	36.153165	-05°18'40"	36°09'11"	292091.482	4003411.423
C	-5.310766	36.117436	-05°18'39"	36°07'03"	292028.058	3999446.765
D	-5.312523	36.107112	-05°18'45"	36°06'26"	291842.662	3998305.119
E	-5.316664	36.096829	-05°19'00"	36°05'49"	291442.598	3997173.231
F	-5.320976	36.092348	-05°19'16"	36°05'32"	291042.534	3996685.348
G	-5.327569	36.088087	-05°19'39"	36°05'17"	290437.559	3996226.739
H	-5.336513	36.086417	-05°20'11"	36°05'11"	289627.674	3996060.858
I	-5.344851	36.086254	-05°20'41"	36°05'11"	288876.334	3996060.858
J	-5.355506	36.087453	-05°21'20"	36°05'15"	287920.084	3996216.981
K	-5.360553	36.089552	-05°21'38"	36°05'22"	287471.232	3996460.922
L	-5.362269	36.090749	-05°21'44"	36°05'27"	287319.988	3996597.529
M	-5.356098	36.104547	-05°21'22"	36°06'16"	287912.766	3998114.845
N	-5.355348	36.108476	-05°21'19"	36°06'31"	287990.827	3998549.061
O	-5.352047	36.115884	-05°21'07"	36°06'57"	288307.951	3999363.825
P	-5.358573	36.123891	-05°21'31"	36°07'26"	287742.007	4000266.409
Q	-5.359129	36.125255	-05°21'33"	36°07'31"	287695.658	4000418.872
R	-5.356969	36.12599	-05°21'25"	36°07'34"	287892.031	4000495.713
S	-5.2934	36.143758	-05°17'36"	36°08'38"	293660.284	4002330.061
T	-5.289087	36.143676	-05°17'21"	36°08'37"	294048.151	4002311.766
U	-5.289354	36.131413	-05°17'22"	36°07'53"	293992.044	4000951.792
V	-5.293703	36.131373	-05°17'37"	36°07'53"	293600.518	4000956.671
W	-5.290278	36.124035	-05°17'25"	36°07'27"	293889.589	4000135.198
X	-5.290304	36.117955	-05°17'25"	36°07'05"	293871.293	3999460.7
Y	-5.300313	36.117785	-05°18'01"	36°07'04"	292969.93	3999463.14
Z	-5.30025	36.123986	-05°18'01"	36°07'26"	292991.884	4000151.054

Gibraltar Port Authority Act 2005

GIBRALTAR PORT AUTHORITY ACT 2005**Principal Act**

Act. No. 2005-14	<i>Commencement (LN. 2006/064)</i>	1.6.2006
	<i>Assent</i>	9.2.2005

Amending enactments	Relevant current provisions	Commencement date
Act. 2009-39	ss. 3(1)(ca) & (2) & 21	29.10.2009
2011-15	s. 3(1)(b)	14.7.2011

English sources:

None cited

2005-14

Gibraltar Port Authority

ARRANGEMENT OF SECTIONS

Sections

1. Title and commencement.
2. Interpretation.
3. Establishment of Gibraltar Port Authority.
4. Authority to be body corporate.
5. Meetings and proceedings.
6. Duties of the Authority.
7. Powers of the Authority.
8. Discharge of functions by the Authority.
9. Standing Orders.
10. Appointment of Chief Executive.
11. Professional advisory committees.
12. Financial duty of the Authority.
13. Establishment and operation of general fund.
14. Accounts and auditing.
15. No personal liability to attach to members.
16. Proceedings on failure of Authority to perform its duties.
17. Restriction on execution.
18. Exemption from taxes, etc.
19. Transfer of property.
20. Regulations.
21. Financial Regulations.

SCHEDULE

AN ACT TO ESTABLISH THE GIBRALTAR PORT AUTHORITY AND TO MAKE PROVISION FOR THE TRANSFER OF CERTAIN OF THE FUNCTIONS AND ACTIVITIES OF THE PORT DEPARTMENT FROM THE GOVERNMENT TO THE AUTHORITY.

Title and commencement.

1.(1) This Act may be cited as the Gibraltar Port Authority Act 2005.

(2) This Act comes into operation on the day appointed by the Minister with responsibility for the Port and Shipping in the Gazette and different days may be appointed for different provisions.

Interpretation.

2. In this Act, unless the context otherwise requires—

“Authority” means the Gibraltar Port Authority established by section 3;

“advisory committee” means a committee established under section 11;

“Chief Executive” means the Chief Executive of the Authority appointed under section 10;

“Port” means—

- (a) that area of water and the foreshore adjacent thereto as is commonly known and recognised as the Port, roadstead and anchorage ground of Gibraltar including Admiralty and Port Waters as defined from time to time in any relevant Order in Council;
- (b) all that area of land defined as being part of the Port in the Port Act; and
- (c) the area within Gibraltar territorial waters commonly known as the Eastern Anchorage, within the co-ordinates specified in the schedule;

“Minister” means the minister with responsibility for the Port and shipping.

Establishment of the Gibraltar Port Authority.

3.(1) The Gibraltar Port Authority is established which shall consist of—

2005-14

Gibraltar Port Authority

- (a) the Minister, as chairman;
- (b) a senior officer of the Ministry with responsibility for the Port, nominated by the Minister;
- (c) the Chief Executive of the Authority;
- (ca) the Financial Secretary;
- (d) one person appointed by the Minister after consultation with registered port employers;
- (e) one person appointed by the Minister after consultation with the Gibraltar Trades Council; and
- (f) two other persons appointed by the Minister not being persons in whole or part-time employment under the Crown in right of its Government of Gibraltar, of whom one shall be a barrister or solicitor of the Supreme Court.

(2) Any member of the Authority (other than a member referred to in paragraph (a), (b), (c) or (ca) of subsection (1)) shall hold office for such period and upon such terms as may be specified in the instrument appointing him.

(3) If the Minister is satisfied that any member referred to in paragraph (d) (e) and (f) of subsection (1)–

- (a) has been absent from three consecutive meetings of the Authority without the permission of the Authority;
- (b) has become bankrupt;
- (c) has been convicted of a criminal offence involving violence or dishonesty or has been sentenced to a term of imprisonment;
- (d) is incapacitated by physical or mental illness; or
- (e) is otherwise unable or unfit to discharge the functions of a member,

the Minister may by notice in the Gazette declare his office as a member of the Authority to be vacant and thereupon his office shall become vacant.

(4) Any member may resign his office by giving written notice to the Authority.

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(5) Any member of the Authority who ceases to be a member (otherwise than under subsections (3) or (4)) shall be eligible for re-appointment.

(6) The Authority shall appoint a person who is an employee of the Authority to be the Secretary of the Authority.

Authority to be body corporate.

4.(1) The Authority shall be a body corporate with perpetual succession under the name of the Gibraltar Port Authority and shall have a common seal which shall be officially and judicially noted.

(2) The common seal of the Authority may only be affixed to an instrument in the presence of the Chief Executive or other person authorised by the Authority for that purpose and one other member of the Authority; the persons so present shall sign the instrument as witnesses to the sealing.

(3) The Authority may sue and be sued in its corporate name.

(4) Service of any process or notice on the Authority may be effected by leaving it at, or sending it by registered post to, the principal office of the Authority.

Meetings and proceedings.

5.(1) The quorum at all meetings of the Authority shall be three members in addition to the Chairman or other person presiding.

(2) At all meetings of the Authority the chairman or, in his absence, such member as the Authority may select shall preside.

(3) Any matters arising at a meeting of the Authority shall be decided by a majority of the members present and voting thereon at the meeting and, in the case of an equality of votes, the person presiding shall have a second, casting, vote.

(4) All orders and directions of the Authority shall be given under the hand of the Chief Executive.

Duties of the Authority.

6.(1) It shall be the duty of the Authority to carry out the functions conferred upon it by this or any other Act or law.

(2) Without prejudice to the generality of subsection (1), it shall be the duty of the Authority—

2005-14

Gibraltar Port Authority

- (a) to manage, supervise, secure, maintain and repair the port wharves, roads, buildings, walls, equipment and other facilities and infrastructure, on behalf of the Government;
 - (b) to operate the port as an efficient maritime centre having due regard to internationally accepted standards of safety and environmental protection;
 - (c) to control and monitor all shipping movements in Gibraltar waters;
 - (d) to provide search and rescue facilities within Gibraltar waters when required;
 - (e) to ensure that all port operators comply with local and international legal standards;
 - (f) to promote new port business especially new business which will enhance port activities already undertaken;
 - (g) to market the Port as efficiently and cost effectively as possible; and
 - (h) to generate revenues for the Government of Gibraltar.
- (3) The Authority shall also—
- (a) employ or take on secondment such persons (including advisers and consultants) as the Authority thinks fit for the proper discharge by the Authority of its functions;
 - (b) publish codes for regulating the terms of service, discipline and training of all persons employed by the Authority;
 - (c) administer and inspect all facilities administered or provided by the Authority so as to ensure the effective and efficient operation of such facilities;
 - (d) license port operators and workers in accordance with the provisions of the Port Operations (Registration and Licensing) Act 2005;
 - (e) prescribe licensing contributions for each class of port operations;
 - (f) prescribe security and safety criteria and procedures to be observed within the Port, subject to the requirements of any other Act or Regulations;

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- (g) ensure that all complaints made against the Authority or any employee of the Authority are properly investigated without delay;
- (h) prepare and implement schemes providing policies and plans designed to meet the present and anticipated future maritime needs in Gibraltar;
- (i) advise the Government on matters of policy relating to the Port; and
- (j) carry out such other duties as the Minister may from time to time direct.

(4) In exercising its powers, duties and functions under this Act the Authority shall act in accordance with the policy of the Government and in accordance with any decision of the Government communicated in writing by the Chairman, in his capacity as Minister, to the Authority.

Powers of the Authority.

7.(1) Subject to the provisions of this or any other Act, the Authority shall have power to do all things necessary for the carrying out of its duties under this or any other Act.

(2) The Authority may acquire any freehold or leasehold land required for the purposes of any of its functions under this or any other Act and dispose of any land so acquired which is no longer required for such purposes.

(3) Without prejudice to the generality of subsection (1), the Authority may—

- (a) purchase, lease or otherwise acquire and hold any property (other than land acquired under subsection (2)) required for the purposes of the Authority and dispose of any such property no longer required for such purposes;
- (b) contract with any person for the supply to, or by, the Authority of any goods, services or personnel;
- (c) erect, equip and maintain all necessary buildings, plant and equipment;
- (d) compile, prepare, print, publish, issue, circulate and distribute, whether for payment or otherwise, such papers, leaflets, magazines, periodicals, books and other literary matter as may

2005-14

Gibraltar Port Authority

be conducive to the attainment of the objectives of the Authority or the advancement of its functions; and

- (e) with the written consent of the Minister, reimburse the members of the Authority for such expenses as are incurred by them with the consent of the Authority.

Discharge of functions by the Authority.

8.(1) Subject to any express provision contained in this or any other Act, the Authority may arrange for the discharge of any of its functions—

- (a) by a committee, a sub-committee or an employee of the Authority; or
- (b) by any Government department or by any other authority.

(2) Any arrangements made by the Authority under this section for the discharge of any of its functions by a committee, sub-committee, employee, Government department or other authority shall not prevent the Authority from exercising those functions.

Standing Orders.

9.(1) Subject to the provisions of this or any other Act, the Authority may regulate its own procedure.

(2) The Authority may make standing orders as respects any committee of the Authority with respect to the quorum, proceedings and place of meeting of the committee (including any sub-committee) but, subject to any such standing orders, the quorum, proceedings and place of meeting shall be such as the committee or sub-committee may determine.

Appointment of Chief Executive.

10.(1) The Minister shall appoint a person to be the Chief Executive of the Authority.

(2) The Chief Executive shall hold office for such period and upon such terms as may be specified in the instrument appointing him.

(3) The Chief Executive shall be the executive officer of the Authority and shall in addition perform such other functions, and exercise such other powers, as are from time to time conferred upon him by this or any other Act or are delegated to him by the Authority.

(4) In the event of the illness, death, retirement, suspension or removal from office or absence from Gibraltar of the Chief Executive, the Authority shall appoint a person to act as Chief Executive.

Professional advisory committees.

11. The Authority may establish any advisory committee to give to the Authority and the Chief Executive such professional and technical advice as may be required.

Financial duty of the Authority.

12. The Authority shall so manage its affairs as to ensure that, taking one year with another, its outgoings are not greater than its revenues from—

- (a) all funds which may from time to time be voted by the House of Assembly for the purposes of the Authority;
- (b) all revenue accruing from dues;
- (c) all fees due to the Authority for the provision of services and facilities provided by the Authority in the exercise of its functions; and
- (d) any money properly accruing to the Authority from any other source.

Establishment and operation of general fund.

13.(1) The Authority shall establish with the Accountant General a general fund—

- (a) into which all money received by the Authority shall be paid; and
- (b) out of which all payments made by the Authority shall be paid.

(2) The Chief Executive shall be responsible for the management of the general fund established under sub-section (1).

(3) The Authority may, with the consent of the Chief Minister borrow temporarily by way of overdraft or otherwise such sums as it may require for meeting its obligations and discharging its functions.

(4) The Government may out of monies appropriated by the House of Assembly make advances for the purposes of meeting expenditure of a capital nature.

2005-14

Gibraltar Port Authority

Accounts and auditing.

14.(1) The Authority shall in the manner and in the form required by the Accountant General keep proper books of account of its operations during each financial year, and shall in like manner and form also cause a statement of its accounts for each financial year to be prepared within three months after the end of that year.

(2) The accounts of the Authority for each financial year shall be audited and certified by the Principal Auditor as soon as practicable after the end of that year.

(3) The Principal Auditor shall, with reference to the accounts of the Authority, report—

- (a) whether he has obtained all the information and explanations which to the best of his knowledge and belief were necessary for the purposes of the audit; and
- (b) whether the Authority has discharged its financial duties and obligations under this Act.

(4) Within one month after the end of the audit of its accounts for any financial year, the Authority shall prepare and submit to the Minister a written report of its operations for that year together with a copy of the audited accounts for that year.

(5) The Minister shall lay a copy of the annual report and of the audited accounts on the table of the House of Assembly as soon as practicable after they have been received by him.

(6) The Authority shall furnish to the Government—

- (a) a copy of the estimates of income and expenditure, including capital expenditure, by no later than the first day of January in each year; and
- (b) such financial and statistical returns as the Government may from time to time require.

No personal liability to attach to members.

15. Subject to the provisions of section 16, no personal liability shall attach to any member of the Authority in respect of anything done or suffered or omitted to be done in good faith and without negligence under the provisions of this or any other Act.

Proceedings on failure of Authority to perform its duties.

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16.(1) If at any time it appears to the Minister that the Authority has failed to comply with any of the provisions of this or any other Act, he may by notice in writing require the Authority to make good the default within such time as may be specified in the notice.

(2) If the Authority fails to comply with the requirements of a notice issued under the provisions of subsection (1), the Attorney General may apply to the Supreme Court for an order requiring the Authority to remedy the default specified and the Supreme Court may make such order on the application as it thinks fit.

(3) Every member of the Authority shall be personally liable for compliance with any such order to the best of his ability.

Restriction on execution.

17. No execution by attachment of property or process in the nature thereof shall be issued against the Authority.

Exemption from taxes, etc.

18. The Authority shall be exempt from all taxes on income and property rates.

Transfer of property.

19.(1) Subject to subsection (2), on the commencement of this Act there shall by virtue of this subsection be transferred to and vest in the Authority all property which immediately before that time was held by the Government wholly or mainly for one or more of its maritime functions.

(2) In this section, "property" does not include freehold or leasehold land.

Regulations.

20. The Minister may make Regulations for the purposes of carrying this Act into effect and for such other matters as are incidental and supplementary to or may be necessary or expedient for the purposes of this Act.

Financial Regulations.

21. The Minister with responsibility for public finance shall have power to make such regulations as he considers appropriate to make provision for the financial control and regulation of the authority and for the conduct of its financial affairs.

2005-14

Gibraltar Port Authority

SCHEDULE

Section 2

EASTERN ANCHORAGE

Position	36°09'.0 N	-	005°	19'.7 W
“	36°09'.0 N	-	005°	17'.5 W
“	36°07'.2 N	-	005°	17'.5 W
“	36°06'.5 N	-	005°	19'.7 W

Environment Act 2005

ENVIRONMENT ACT 2005**Principal Act**

Act. No. 2005-27	<i>Commencement</i>	29.3.2005
	<i>Assent</i>	29.3.2005

Amending enactments	Relevant current provisions	Commencement date
None		

EU Legislation/International Agreements involved:

Directive 75/442/EEC
 Directive 79/409/EEC
 Directive 85/337/EEC
 Directive 91/271/EEC
 Directive 91/689/EEC
 Directive 92/43/EEC
 Directive 97/11/EC
 Directive 97/62/EC
 Directive 2001/42/EC

English sources:

None cited

ARRANGEMENT OF SECTIONS**PART 1****INTRODUCTORY PROVISIONS**

1. Title.
2. Interpretation.
3. Consultation bodies.

PART 2**ENVIRONMENTAL ASSESSMENT FOR PLANS AND PROGRAMMES**

4. Environmental assessment for plans and programmes: first formal preparatory act after 21 July 2004.
5. Environmental assessment for plans and programmes: first formal preparatory act on or before 21 July 2004.
6. Environmental assessment for plans and programmes co-financed by the European Community.
7. Restriction on adoption or submission of plans, programmes and modifications.
8. Determinations of the responsible authority.
9. Powers of the Minister.
10. Publicity for determinations and directions.

PART 3**ENVIRONMENTAL REPORTS AND CONSULTATION PROCEDURES**

11. Preparation of environmental report.
12. Consultation procedures.
13. Transboundary consultations.
14. Plans and programmes of other Member States.

PART 4**POST-ADOPTION PROCEDURES**

15. Information as to adoption of plan or programme.
16. Monitoring of implementation of plans and programmes.

PART 5**GENERAL**

Environment

17. Relationship with other Community Legislation.
18. Regulations.
19. Amendment of schedules.

SCHEDULE 1

Criteria for determining the likely significance of effects on the environment.

SCHEDULE 2

Information for environmental reports.

SCHEDULE 3

Annexes I & II of the Directive.

AN ACT FOR THE PURPOSE OF TRANSPOSING INTO THE LAW OF GIBRALTAR DIRECTIVE 2001/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 27 JUNE 2001 ON THE ASSESSMENT OF THE EFFECTS OF CERTAIN PLANS AND PROGRAMMES ON THE ENVIRONMENT AND TO PROVIDE FOR REGULATIONS TO BE MADE FOR COMPLIANCE WITH EUROPEAN UNION OBLIGATIONS.

PART 1

INTRODUCTORY PROVISIONS

Title.

1. This Act may be cited as the Environment Act 2005.

Interpretation.

- 2.(1) In this Act unless the context otherwise requires—

“consultation body” has the meaning given to it by section 3;

“Direction” means a direction given by the Minister under section 9(3);

“Directive” means Directive 2001/42/EC of the European Parliament and of the Council on the assessment of the effects of certain plans and programmes on the environment;

“Habitats Directive” means Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora as adapted to technical and scientific progress by Council Directive 97/62/EC;”

“Minister” means the Minister with responsibility for the Environment;

“plans and programmes” means plans and programmes, including those co-financed by the European Community, as well as any modifications to them, which-

- (a) are subject to preparation or adoption by an authority; or
- (b) are prepared for adoption, through a legislative procedure by the Parliament or Government; and, in either case,
- (c) are required by legislative, regulatory or administrative provisions;

“responsible authority”, in relation to a plan or programme, means–

- (a) the authority by which or on whose behalf it is prepared; or
- (b) where, at any particular time, that authority ceases to be responsible, or solely responsible, for taking steps in relation to the plan or programme, the person who, at that time, is responsible (solely or jointly with the authority) for taking those steps.

(2) Other expressions used both in this Act and in the Directive have the same meaning in this Act as they have in the Directive.

Consultation bodies.

3. In relation to every plan or programme to which this Act applies, each of the following bodies shall be a consultation body–

- (a) the Environment Agency; and
- (b) any statutory body which has a specific environmental responsibility.

**PART 2
ENVIRONMENTAL ASSESSMENT FOR PLANS AND
PROGRAMMES**

Environmental assessment for plans and programmes: first formal preparatory act after 21 July 2004.

4.(1) Subject to subsections (5) and (6) and section 6, where–

- (a) the first formal preparatory act of a plan or programme is subsequent to 21 July 2004; and
- (b) the plan or programme is of the description set out in either subsection (2) or (3),

the responsible authority shall carry out, or secure the carrying out of, an environmental assessment, in accordance with Part 3 of this Act, during the preparation of that plan or programme and before its adoption or submission to the legislative procedure.

(2) A plan or programme under subsection (1)(b) is one which–

Environment

- (a) is prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use; and
- (b) sets the framework for future development consent of projects listed in Annexes I or II to Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by Council Directive 97/11/EC and which are set out in Schedule 3.

(3) A plan or programme under subsection (1)(b) is one which, in view of the likely effect on sites, has been determined to require an assessment pursuant to Article 6 or 7 of the Habitats Directive.

(4) Subject to subsection (5) and section 6, where—

- (a) the first formal preparatory act of a plan or programme, other than a plan or programme of the description set out in subsection (2) or (3), is subsequent to 21 July 2004;
- (b) the plan or programme sets the framework for future development consent of projects; and
- (c) the plan or programme is the subject of a determination under section 8(1) or a Direction under section 9(3) that it is likely to have significant environmental effects,

the responsible authority shall carry out, or secure the carrying out of, an environmental assessment, in accordance with Part 3 of this Act, during the preparation of that plan or programme and before its adoption or submission to the legislative procedure.

(5) Nothing in subsections (1) or (4) requires the carrying out of an environmental assessment for—

- (a) a plan or programme the sole purpose of which is to serve national defence or civil emergency;
- (b) a financial or budget plan or programme; or
- (c) a plan or programme co-financed under—
 - (i) the 2000-2006 programming period for Council Regulation (EC) No. 1260/1999; or
 - (ii) the 2000-2006 or 2000-2007 programming period for Council Regulation (EC) No. 1257/1999.

- (6) An environmental assessment need not be carried out–
- (a) for a plan or programme of the description set out in subsections (2) or (3) which determines the use of a small area at local level; or
 - (b) for a minor modification to a plan or programme of the description set out in either of those subsections,

unless it has been determined under section 8(1) that the plan, programme or modification, as the case may be, is likely to have significant environmental effects, or it is the subject of a Direction under section 9(3).

Environmental assessment for plans and programmes: first formal preparatory act on or before 21 July 2004.

- 5.(1) Subject to subsection (2) and section 6, where–
- (a) a plan or programme of which the first formal preparatory act is on or before 21 July 2004 has not been adopted or submitted to the legislative procedure for adoption before 22 July 2006; and
 - (b) the plan or programme is such that, had the first act in its preparation occurred after 21 July 2004, the plan or programme would have required an environmental assessment by virtue of section 4(1); or
 - (c) the responsible authority is of the opinion that, if a determination under section 8(1) in respect of the plan or programme had been made after 21st July 2004, it would have determined that the plan or programme was likely to have significant environmental effects,

the responsible authority shall carry out, or secure the carrying out of, an environmental assessment, in accordance with Part 3 of this Act, during the preparation of that plan or programme and before its adoption or submission to the legislative procedure.

- (2) Nothing in subsection (1) shall require the environmental assessment of a particular plan or programme if the responsible authority–
- (a) decides that such assessment is not feasible; and
 - (b) informs the public of its decision.

Environment

Environmental assessment for plans and programmes co-financed by the European Community.

6. The environmental assessment required by any provision of this Part for a plan or programme co-financed by the European Community shall be carried out by the responsible authority in conformity with the specific provisions in relevant Community legislation.

Restriction on adoption or submission of plans, programmes and modifications.

7.(1). A plan, programme or modification in respect of which a determination under section 8(1) is required shall not be adopted or submitted to the legislative procedure for the purpose of its adoption—

- (a) where an environmental assessment is required in consequence of the determination or of a Direction, before the requirements of subsection (3) below have been met;
- (b) in any other case, before the determination has been made under section 8(1).

(2) A plan or programme for which an environmental assessment is required by any provision of this Part shall not be adopted or submitted to the legislative procedure for the purpose of its adoption before—

- (a) if it is a plan or programme co-financed by the European Community, the environmental assessment has been carried out in accordance with section 6;
- (b) in any other case, the requirements of subsection (3) below, and such requirements of Part 3 as apply in relation to the plan or programme, have been met.

(3) The requirements of this subsection are that account shall be taken of—

- (a) the environmental report for the plan or programme;
- (b) opinions expressed in response to the invitation referred to in section 12(2)(d);
- (c) opinions expressed in response to action taken by the responsible authority in accordance with section 12(4); and
- (d) the outcome of any consultations under section 13(4).

Determinations of the responsible authority.

8.(1) The responsible authority shall determine whether or not a plan, programme or modification of a description referred to in–

- (a) section 4(4)(a) and (b);
- (b) section 4(6)(a); or
- (c) section 4(6)(b),

is likely to have significant environmental effects.

(2) Before making a determination under subsection (1) the responsible authority shall–

- (a) take into account the criteria specified in Schedule 1; and
- (b) consult the consultation bodies.

(3) Where the responsible authority determines that the plan, programme or modification is unlikely to have significant environmental effects (and, accordingly, does not require an environmental assessment), it shall prepare a statement of its reasons for the determination.

Powers of the Minister.

9.(1) The Minister may at any time before the adoption of a plan, programme or modification or its submission to the legislative procedure for the purpose of its adoption (as the case may be), require the responsible authority to send him a copy of–

- (a) any determination under section 8(1) with respect to the plan, programme or modification;
- (b) the plan, programme or modification to which the determination relates; and
- (c) where section 8(3) applies, the statement prepared in accordance with that subsection.

(2) The responsible authority shall comply with a requirement under subsection (1) within 7 days.

(3) The Minister may direct that a plan, programme or modification is likely to have significant environmental effects (whether or not a copy of it has been sent to him in response to a requirement under subsection (1)).

(4) Before giving a Direction the Minister shall–

Environment

2005-27

- (a) take into account the criteria specified in Schedule 1; and
- (b) consult the consultation bodies.

(5) The Minister shall, as soon as reasonably practicable after the giving of the Direction, send to the responsible authority and to each consultation body—

- (a) a copy of the Direction; and
- (b) a statement of his reasons for giving the Direction.

(6) In relation to a plan, programme or modification in respect of which a Direction has been given—

- (a) any determination under section 8(1) with respect to the plan, programme or modification shall cease to have effect on the giving of the Direction; and
- (b) if no determination has been made under section 8(1) with respect to the plan, programme or modification, the responsible authority shall cease to be under any duty imposed by that section.

Publicity for determinations and Directions.

10.(1) Within 28 days of making a determination under section 8(1), the responsible authority shall send to each consultation body—

- (a) a copy of the determination; and
- (b) where the responsible authority has determined that the plan or programme does not require an environmental assessment, a statement of its reasons for the determination.

(2) The responsible authority shall—

- (a) keep a copy of the determination, and any accompanying statement of reasons, available at its principal office for inspection by the public at all reasonable times and free of charge; and
- (b) within 28 days of the making of the determination, take such steps as it considers appropriate to bring to the attention of the public—

- (i) the title of the plan, programme or modification to which the determination relates;
 - (ii) that the responsible authority has determined that the plan, programme or modification is or is not likely to have significant environmental effects (as the case may be) and, accordingly, that an environmental assessment is or is not required in respect of the plan, programme or modification; and
 - (iii) the address (which may include a website) at which a copy of the determination and any accompanying statement of reasons may be inspected or from which a copy may be obtained.
- (3) Where the responsible authority receives a Direction it shall—
- (a) keep a copy of the Direction and of the Minister’s statement of his reasons for giving it available at its principal office for inspection by the public at all reasonable times and free of charge; and
 - (b) within 28 days of the receipt of such a Direction, take such steps as it considers appropriate to bring to the attention of the public—
 - (i) the title of the plan, programme or modification to which the Direction relates;
 - (ii) that the Minister has directed that the plan, programme or modification is likely to have significant environmental effects and, accordingly, that an environmental assessment is required in respect of the plan, programme or modification; and
 - (iii) the address (which may include a website) at which a copy of the Direction and of the Minister’s statement of his reasons for giving it may be inspected or from which a copy may be obtained.
- (4) Nothing in subsections (2)(b)(iii) or (3)(b)(iii) shall require the responsible authority to provide a copy of any document free of charge; but, where a charge is made, it shall be a reasonable amount.

PART 3

Environment

2005-27

ENVIRONMENTAL REPORTS AND CONSULTATION PROCEDURES

Preparation of environmental report.

11.(1) Where an environmental assessment is required by any provision of Part 2 of this Act, the responsible authority shall prepare, or secure the preparation of, an environmental report in accordance with subsections (2) and (3).

(2) The report shall identify, describe and evaluate the likely significant effects on the environment of—

- (a) implementing the plan or programme; and
- (b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme.

(3) The report shall include such of the information referred to in Schedule 2 as may reasonably be required, taking account of—

- (a) current knowledge and methods of assessment;
- (b) the contents and level of detail in the plan or programme;
- (c) the stage of the plan or programme in the decision-making process; and
- (d) the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment.

(4) Information referred to in Schedule 2 may be provided by reference to relevant information obtained at other levels of decision-making or through other Community legislation.

(5) When deciding on the scope and level of detail of the information that must be included in the report, the responsible authority shall consult the consultation bodies.

(6) Where a consultation body wishes to respond to a consultation under subsection (5), it shall do so within the period of 5 weeks beginning with the date on which the consultation begins.

Consultation procedures.

12.(1) Every draft plan or programme for which an environmental report has been prepared in accordance with section 11 and its accompanying

environmental report (“the relevant documents”) shall be made available for the purposes of consultation in accordance with the following provisions of this section.

(2) As soon as reasonably practicable after the preparation of the relevant documents, the responsible authority shall–

- (a) send a copy of those documents to each consultation body;
- (b) take such steps as it considers appropriate to bring the preparation of the relevant documents to the attention of the persons who, in the authority’s opinion, are affected or likely to be affected by, or have an interest in the decisions involved in the assessment and adoption of the plan or programme concerned, required under the Directive (“the public consultees”);
- (c) inform the consultation bodies and the public consultees of the address (which may include a website) at which a copy of the relevant documents may be viewed, or from which a copy may be obtained; and
- (d) invite the consultation bodies and the public consultees to express their opinion on the relevant documents, specifying the address to which, and the period within which, opinions must be sent.

(3) The period referred to in subsection (2)(d) must be of such length as will ensure that the consultation bodies and the public consultees are given an effective opportunity to express their opinion on the relevant documents.

(4) The responsible authority shall keep a copy of the relevant documents available at its principal office for inspection by the public at all reasonable times and free of charge.

(5) Nothing in subsection (2)(c) shall require the responsible authority to provide copies free of charge; but where a charge is made, it shall be a reasonable amount.

Transboundary consultations.

13.(1) Where a responsible authority, other than the Minister, is of the opinion that a plan or programme for which it is the responsible authority is likely to have significant effects on the environment of another Member State, it shall, as soon as reasonably practicable after forming that opinion–

- (a) notify the Minister of its opinion and of the reasons for it; and

Environment

- (b) supply the Minister with a copy of the plan or programme concerned, and of the accompanying environmental report.

(2) Where the Minister has been notified under subsection (1)(a), the responsible authority shall, within such period as the Minister may specify by notice in writing to the authority, provide the Minister with such other information about the plan or programme or its accompanying environmental report as he may reasonably require.

(3) Where—

- (a) the Minister, whether in consequence of a notice under subsection (1)(a) or otherwise, considers that the implementation of a plan or programme in Gibraltar is likely to have significant effects on the environment of another Member State; or
- (b) a Member State that is likely to be significantly affected by the implementation of a plan or programme so requests, the Minister shall, before the adoption of the plan or programme or its submission to the legislative procedure for adoption, forward a copy of it and of its accompanying environmental report to the Member State.

(4) Where the Minister receives from a Member State an indication that it wishes to enter into consultations before the adoption, or submission to the legislative procedure for adoption, of a plan or programme forwarded to it in accordance with subsection (3), the Minister shall—

- (a) agree with the Member State—
 - (i) detailed arrangements to ensure that the authorities referred to in paragraph 3 of Article 6 of the Directive and the public referred to in paragraph 4 of that Article in the Member State likely to be significantly affected are informed and given an opportunity to forward their opinion within a reasonable time; and
 - (ii) a reasonable time for the duration of the consultations;
- (b) enter into consultations with the Member State concerning—
 - (i) the likely transboundary environmental effects of implementing the plan or programme; and
 - (ii) the measures envisaged to reduce or eliminate such effects; and

- (c) where he is not the responsible authority, direct the responsible authority that it shall not adopt the plan or programme, or submit it to the legislative procedure for adoption, until the consultations with the Member State have been concluded.

(5) Where consultations take place pursuant to subsection (4), the Minister shall—

- (a) as soon as reasonably practicable after those consultations begin, notify the consultation bodies of that fact; and
- (b) notify the consultation bodies and, where he is not the responsible authority, the responsible authority, of the outcome of the consultations.

Plans and programmes of other Member States.

14.(1) This section applies where the Minister receives from a Member State a copy of a draft plan or programme—

- (a) that is being prepared in relation to any part of that Member State; and
- (b) whose implementation is likely to have significant effects on the environment of Gibraltar.

(2) The Minister shall indicate to the Member State whether, before the adoption of the plan or programme or its submission to the legislative procedure for adoption, he wishes to enter into consultations in respect of that plan or programme concerning—

- (a) the likely transboundary environmental effects of implementing the plan or programme; and
- (b) the measures envisaged to reduce or eliminate such effects.

(3) Where the Minister so indicates, he shall agree with the Member State concerned—

- (a) detailed arrangements to ensure that the consultation bodies and the public in Gibraltar that is likely to be significantly affected by the implementation of the plan or programme, are informed and given an opportunity to forward their opinion within a reasonable time; and
- (b) a reasonable time for the duration of the consultations.

Environment

(4) Where such consultations take place under this section, the Minister shall—

- (a) inform the consultation bodies of the receipt of the draft plan or programme;
- (b) provide them with a copy of the draft plan or programme and the relevant environmental report provided under Article 7.1 of the Directive or specify the address (which may include a website) at which those documents may be inspected;
- (c) take such steps as he considers appropriate to bring the receipt of the draft plan or programme to the attention of such persons as, in his opinion, are affected or likely to be affected by, or have an interest in the decisions involved in the assessment and adoption of the plan or programme concerned, required under the Directive (“the transboundary consultees”);
- (d) inform the transboundary consultees of the address (which may include a website) at which a copy of the draft plan or programme and the relevant environmental report provided under Article 7.1 of the Directive may be inspected, or from which a copy may be obtained; and
- (e) invite the consultation bodies and the transboundary consultees to forward to him their opinions within such period as he may specify.

(5) The period specified under subsection (4)(e) shall end not later than 28 days before the end of the period that the Minister has agreed with the Member State concerned, pursuant to subsection (3)(b), as reasonable for the duration of their consultations.

(6) Nothing in subsection (4)(d) shall require the Minister to provide copies free of charge; but where a charge is made, it shall be of a reasonable amount.

PART 4

POST-ADOPTION PROCEDURES

Information as to adoption of plan or programme.

15.(1) As soon as reasonably practicable after the adoption of a plan or programme for which an environmental assessment has been carried out under this Act, the responsible authority shall—

- (a) make a copy of the plan or programme and its accompanying environmental report available at its principal office for inspection by the public at all reasonable times and free of charge; and
 - (b) take such steps as it considers appropriate to bring to the attention of the public—
 - (i) the title of the plan or programme;
 - (ii) the date on which it was adopted;
 - (iii) the address (which may include a website) at which a copy of it and of its accompanying environmental report, and of a statement containing the particulars specified in subsection (4), may be viewed or from which a copy may be obtained;
 - (iv) the times at which inspection may be made; and
 - (v) that inspection may be made free of charge.
- (2) As soon as reasonably practicable after the adoption of a plan or programme—
- (a) the responsible authority shall inform—
 - (i) the consultation bodies;
 - (ii) the persons who, in relation to the plan or programme, were public consultees for the purposes of section 12; and
 - (iii) where the responsible authority is not the Minister, the Minister; and
 - (b) the Minister shall inform the Member State with which consultations in relation to the plan or programme have taken place under section 13(4), of the matters referred to in subsection (3).
- (3) The matters are—
- (a) that the plan or programme has been adopted;
 - (b) the date on which it was adopted; and
 - (c) the address (which may include a website) at which a copy of—

Environment

- (i) the plan or programme, as adopted,
- (ii) its accompanying environmental report, and
- (iii) a statement containing the particulars specified in subsection (4), may be viewed, or from which a copy may be obtained.

(4) The particulars referred to in subsections (1)(b)(iii) and (3)(c)(iii) are—

- (a) how environmental considerations have been integrated into the plan or programme;
- (b) how the environmental report has been taken into account;
- (c) how opinions expressed in response to—
 - (i) the invitation referred to in section 12(2)(d);
 - (ii) action taken by the responsible authority in accordance with section 12(4),
have been taken into account;
- (d) how the results of any consultations entered into under section 13(4) have been taken into account;
- (e) the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and
- (f) the measures that are to be taken to monitor the significant environmental effects of the implementation of the plan or programme.

Monitoring of implementation of plans and programmes.

16.(1) The responsible authority shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action.

(2) The responsible authority's monitoring arrangements may comprise or include arrangements established otherwise than for the express purpose of complying with subsection (1).

PART 5**GENERAL****Relationship with other Community Legislation.**

17.(1) Subject to subsection (2), where a Community provision other than the Directive requires that an environmental assessment be carried out this Act shall not affect that requirement.

(2) In respect of a plan or programme in respect of which the Directive and another Community provision simultaneously require that an environmental assessment be carried out, the responsible authority may take appropriate measures to ensure that the environmental assessment is not duplicated.

Regulations.

18. The Government may make regulations—

- (a) for the purposes of giving effect to the provisions of the Directive;
- (b) for any purpose connected with or incidental to this Act; or
- (c) for compliance with any European Union obligation.

Amendment of schedules.

19. The Government may amend the schedules to this Act by a notice published in the Gazette.

SCHEDULE 1

Sections 8(2)(a) and 9(4)(a)

**CRITERIA FOR DETERMINING THE LIKELY SIGNIFICANCE
OF
EFFECTS ON THE ENVIRONMENT**

1. The characteristics of plans and programmes, having regard, in particular, to—

- (a) the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources;
- (b) the degree to which the plan or programme influences other plans and programmes including those in a hierarchy;
- (c) the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development;
- (d) environmental problems relevant to the plan or programme; and
- (e) the relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste management or water protection).

2. Characteristics of the effects and of the area likely to be affected, having regard, in particular, to—

- (a) the probability, duration, frequency and reversibility of the effects;
- (b) the cumulative nature of the effects;
- (c) the transboundary nature of the effects;
- (d) the risks to human health or the environment (e.g. due to accidents);
- (e) the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected);

- (f) the value and vulnerability of the area likely to be affected due to—
 - (i) special natural characteristics or cultural heritage;
 - (ii) exceeded environmental quality standards or limit values; or
 - (iii) intensive land-use; and
- (g) the effects on areas or landscapes which have a recognised national, Community or international protection status.

SCHEDULE 2

Sections 11(3) and (4)

INFORMATION FOR ENVIRONMENTAL REPORTS

1. An outline of the contents and main objectives of the plan or programme, and of its relationship (if any) with other relevant plans and programmes.
2. The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.
3. The environmental characteristics of areas likely to be significantly affected.
4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.
5. The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.
6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues such as—
 - (a) biodiversity;
 - (b) population;
 - (c) human health;
 - (d) fauna;
 - (e) flora;
 - (f) soil;
 - (g) water;
 - (h) air;

- (i) climatic factors;
- (j) material assets;
- (k) cultural heritage, including architectural and archaeological heritage;
- (l) landscape; and
- (m) the inter-relationship between the issues referred to in subparagraphs (a) to (l).

7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.

8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.

9. A description of the measures envisaged concerning monitoring in accordance with section 16.

10. A non-technical summary of the information provided under paragraphs 1 to 9.

SCHEDULE 3

Section 4(2)(b)

This Schedule reproduces Annexes I and II of Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by Council Directive 97/11/EC.

Annex I**Projects subject to Article 4 (1)**

1. Crude-oil refineries (excluding undertakings manufacturing only lubricants from crude oil) and installations for the gasification and liquefaction of 500 tonnes or more of coal or bituminous shale per day.

2. Thermal power stations and other combustion installations with a heat output of 300 megawatts or more, and

- nuclear power stations and other nuclear reactors including the dismantling or decommissioning of such power stations or reactors¹ (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load).

3.(a) Installations for the reprocessing of irradiated nuclear fuel.

(b) Installations designed:

- for the production or enrichment of nuclear fuel,

- for the processing of irradiated nuclear fuel or high-level radioactive waste,

- for the final disposal of irradiated nuclear fuel,

- solely for the final disposal of radioactive waste,

- solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site.

4. - Integrated works for the initial smelting of cast-iron and steel;

¹ Nuclear power stations and other nuclear reactors cease to be such an installation when all nuclear fuel and other radioactively contaminated elements have been removed permanently from the installation site.

- Installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes.

5. Installations for the extraction of asbestos and for the processing and transformation of asbestos and products containing asbestos: for asbestos-cement products, with an annual production of more than 20,000 tonnes of finished products, for friction material, with an annual production of more than 50 tonnes of finished products, and for other uses of asbestos, utilization of more than 200 tonnes per year.

6. Integrated chemical installations, i.e. those installations for the manufacture on an industrial scale of substances using chemical conversion processes, in which several units are juxtaposed and are functionally linked to one another and which are:

(i) for the production of basic organic chemicals;

(ii) for the production of basic inorganic chemicals;

(iii) for the production of phosphorous-, nitrogen- or potassium-based fertilizers (simple or compound fertilizers);

(iv) for the production of basic plant health products and of biocides;

(v) for the production of basic pharmaceutical products using a chemical or biological process;

(vi) for the production of explosives.

7.(a) Construction of lines for long-distance railway traffic and of airports² with a basic runway length of 2,100 m or more;

(b) Construction of motorways and express roads³;

(c) Construction of a new road of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new road, or realigned and/or widened section of road would be 10 km or more in a continuous length.

² For the purposes of this Directive, 'airport' means airports which comply with the definition in the 1944 Chicago Convention setting up the International Civil Aviation Organization (Annex 14).

³ For the purposes of the Directive, 'express road' means a road which complies with the definition in the European Agreement on Main International Traffic Arteries of 15 November 1975.

Environment

8.(a) Inland waterways and ports for inland-waterway traffic which permit the passage of vessels of over 1 350 tonnes;

(b) Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1 350 tonnes.

9. Waste disposal installations for the incineration, chemical treatment as defined in Annex IIA to Directive 75/442/EEC⁴ under heading D9, or landfill of hazardous waste (i.e. waste to which Directive 91/689/EEC⁵ applies).

10. Waste disposal installations for the incineration or chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9 of non-hazardous waste with a capacity exceeding 100 tonnes per day.

11. Groundwater abstraction or artificial groundwater recharge schemes where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.

12.(a) Works for the transfer of water resources between river basins where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres/year;

(b) In all other cases, works for the transfer of water resources between river basins where the multi-annual average flow of the basin of abstraction exceeds 2 000 million cubic metres/year and where the amount of water transferred exceeds 5 % of this flow.

In both cases transfers of piped drinking water are excluded.

13. Waste water treatment plants with a capacity exceeding 150 000 population equivalent as defined in Article 2 point (6) of Directive 91/271/EEC⁶.

14. Extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 tonnes/day in the case of petroleum and 500 000 m³/day in the case of gas.

⁴ OJ No L 194, 25.7.1975, p. 39. Directive as last amended by Commission Decision 94/3/EC (OJ No L 5, 7.1.1994, p.15).

⁵ (2) OJ No L 377, 31.12.1991, p.20. Directive as last amended by Directive 94/31/EC (OJ No L 168, 2.7.1994, p.28).

⁶ OJ No L 135, 30.5.1991, p.40. Directive as last amended by the 1994 Act of Accession.

15. Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres.
16. Pipelines for the transport of gas, oil or chemicals with a diameter of more than 800 mm and a length of more than 40 km.
17. Installations for the intensive rearing of poultry or pigs with more than:
- (a) 85 000 places for broilers, 60 000 places for hens;
 - (b) 3 000 places for production pigs (over 30 kg); or
 - (c) 900 places for sows.
18. Industrial plants for the
- (a) production of pulp from timber or similar fibrous materials;
 - (b) production of paper and board with a production capacity exceeding 200 tonnes per day.
19. Quarries and open-cast mining where the surface of the site exceeds 25 hectares, or peat extraction, where the surface of the site exceeds 150 hectares.
20. Construction of overhead electrical power lines with a voltage of 220 kV or more and a length of more than 15 km.
21. Installations for storage of petroleum, petrochemical, or chemical products with a capacity of 200 000 tonnes or more.
22. Any change to or extension of projects listed in this Annex where such a change or extension in itself meets the thresholds, if any, set out in this Annex.

ANNEX II

PROJECTS SUBJECT TO ARTICLE 4 (2)

1. Agriculture, silviculture and aquaculture

- (a) Projects for the restructuring of rural land holdings;
- (b) Projects for the use of uncultivated land or semi-natural areas for intensive agricultural purposes;

Environment

- (c) Water management projects for agriculture, including irrigation and land drainage projects;
- (d) Initial afforestation and deforestation for the purposes of conversion to another type of land use;
- (e) Intensive livestock installations (projects not included in Annex I);
- (f) Intensive fish farming;
- (g) Reclamation of land from the sea.

2. Extractive industry

- (a) Quarries, open-cast mining and peat extraction (projects not included in Annex I);
- (b) Underground mining;
- (c) Extraction of minerals by marine or fluvial dredging;
- (d) Deep drillings, in particular:
 - geothermal drilling,
 - drilling for the storage of nuclear waste material,
 - drilling for water supplies,with the exception of drillings for investigating the stability of the soil;
- (e) Surface industrial installations for the extraction of coal, petroleum, natural gas and ores, as well as bituminous shale.

3. Energy industry

- (a) Industrial installations for the production of electricity, steam and hot water (projects not included in Annex I);
- (b) Industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cables (projects not included in Annex I);
- (c) Surface storage of natural gas;
- (d) Underground storage of combustible gases;
- (e) Surface storage of fossil fuels;

- (f) Industrial briquetting of coal and lignite;
- (g) Installations for the processing and storage of radioactive waste (unless included in Annex I);
- (h) Installations for hydroelectric energy production;
- (i) Installations for the harnessing of wind power for energy production (wind farms).

4. Production and processing of metals

- (a) Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting;
- (b) Installations for the processing of ferrous metals:
 - (i) hot-rolling mills;
 - (ii) smitheries with hammers;
 - (iii) application of protective fused metal coats;
- (c) Ferrous metal foundries;
- (d) Installations for the smelting, including the alloyage, of non-ferrous metals, excluding precious metals, including recovered products (refining, foundry casting, etc.);
- (e) Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process;
- (f) Manufacture and assembly of motor vehicles and manufacture of motor vehicle engines;
- (g) Shipyards;
- (h) Installations for the construction and repair of aircraft;
- (i) Manufacture of railway equipment;
- (j) Swaging by explosives;
- (k) Installations for the roasting and sintering of metallic ores.

5. Mineral industry

Environment

2005-27

- (a) Coke ovens (dry coal distillation);
- (b) Installations for the manufacture of cement;
- (c) Installations for the production of asbestos and the manufacture of asbestos-products (projects not included in Annex I);
- (d) Installations for the manufacture of glass including glass fibre;
- (e) Installations for smelting mineral substances including the production of mineral fibres;
- (f) Manufacture of ceramic products by burning, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain.

6. Chemical industry (Projects not included in Annex I)

- (a) Treatment of intermediate products and production of chemicals;
- (b) Production of pesticides and pharmaceutical products, paint and varnishes, elastomers and peroxides;
- (c) Storage facilities for petroleum, petrochemical and chemical products.

7. Food industry

- (a) Manufacture of vegetable and animal oils and fats;
- (b) Packing and canning of animal and vegetable products;
- (c) Manufacture of dairy products;
- (d) Brewing and malting;
- (e) Confectionery and syrup manufacture;
- (f) Installations for the slaughter of animals;
- (g) Industrial starch manufacturing installations;
- (h) Fish-meal and fish-oil factories;
- (i) Sugar factories.

8. Textile, leather, wood and paper industries

- (a) Industrial plants for the production of paper and board (projects not included in Annex I);

- (b) Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles;
- (c) Plants for the tanning of hides and skins;
- (d) Cellulose-processing and production installations.

9. Rubber industry

Manufacture and treatment of elastomer-based products.

10. Infrastructure projects

- (a) Industrial estate development projects;
- (b) Urban development projects, including the construction of shopping centres and car parks;
- (c) Construction of railways and intermodal transshipment facilities, and of intermodal terminals (projects not included in Annex I);
- (d) Construction of (projects not included in Annex I);
- (e) Construction of roads, harbours and port installations, including fishing harbours (projects not included in Annex I);
- (f) Inland-waterway construction not included in Annex I, canalisation and flood-relief works;
- (g) Dams and other installations designed to hold water or store it on a long-term basis (projects not included in Annex I);
- (h) Tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport;
- (i) Oil and gas pipeline installations (projects not included in Annex I);
- (j) Installations of long-distance aqueducts;
- (k) Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works;
- (l) Groundwater abstraction and artificial groundwater recharge schemes not included in Annex I;

Environment

(m) Works for the transfer of water resources between river basins not included in Annex I.

11. Other projects

- (a) Permanent racing and test tracks for motorized vehicles;
- (b) Installations for the disposal of waste (projects not included in Annex I);
- (c) Waste-water treatment plants (projects not included in Annex I);
- (d) Sludge-deposition sites;
- (e) Storage of scrap iron, including scrap vehicles;
- (f) Test benches for engines, turbines or reactors;
- (g) Installations for the manufacture of artificial mineral fibres;
- (h) Installations for the recovery or destruction of explosive substances;
- (i) Knackers' yards.

12. Tourism and leisure

- (a) Ski-runs, ski-lifts and cable-cars and associated developments;
- (b) Marinas;
- (c) Holiday villages and hotel complexes outside urban areas and associated developments;
- (d) Permanent camp sites and caravan sites;
- (e) Theme parks.

13. Any change or extension of projects listed in Annex I or Annex II, already authorized, executed or in the process of being executed, which may have significant adverse effects on the environment (change or extension not included in Annex I);

- Projects in Annex I, undertaken exclusively or mainly for the development and testing of new methods or products and not used for more than two years.

Environment (Quality of Bathing Water) Regulations 2009

Environment

2005-27

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

Subsidiary Legislation made under s. 18(c).

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009****(LN. 2009/033)**

<i>Commencement</i>	4.6.2009	rr. 1, 2 to 6, 10, 12, 13 and 17
	24.3.2011	rr. 7 to 9, 11, 24, 26 and 27
	24.3.2015	rr. 14 to 16, 18 to 23, 25 and 28

Amending enactments	Relevant current provisions	Commencement date
LN. 2011/153	r. 27A	22.9.2011
2013/139	rr. 2, 3(2)(b), 6, 9(1), (5), 11, 15, 18, 19, 20, 21, 22(a),(b),(c), 23(2), 25, 28(3), Schs. 1 & 2	10.10.2013

EU Legislation/International Agreements involved:

Directive 76/160/EEC

Directive 2006/7/EC

Directive 2008/99/EC

ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009

ARRANGEMENT OF REGULATIONS

Regulations.

**PART 1
PRELIMINARY**

1. Title and commencement.
2. Interpretation.
3. Designation of bathing waters.
4. Determination of the length of the bathing season.
5. General duties.
6. Public participation.

**PART 2
BATHING WATER PROFILES**

7. Bathing water profiles.
8. Contents of the bathing water profile.
9. Review of the bathing water profile.

**PART 3
MONITORING OF BATHING WATERS**

10. Monitoring of bathing waters.
11. Public information.
12. Location of monitoring point.
13. Monitoring calendar.
14. Frequency of monitoring.
15. Short-term pollution.
16. Sampling equipment.
17. Storage and transport of samples before analysis.
18. Reference methods of analysis.
19. Cyanobacteria.
20. Other Pollution.
21. Macro-Algae and Marine Phytoplankton.

**PART 4
BATHING WATER ASSESSMENT AND CLASSIFICATION**

22. Bathing Water Quality Assessment.
23. Classification.

**PART 5
MANAGEMENT OF BATHING WATERS**

2005-27**Environment**

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009****Subsidiary
2009/033**

24. Management measures at bathing waters subject to pollution incidents.
25. Additional management measures at “poor” bathing waters.
26. Relevant procedures for short-term pollution.
27. Enforcement.
- 27A. Liability of bodies corporate - general.
28. Reporting procedures.

**SCHEDULE 1
CLASSIFICATION****SCHEDULE 2
SYMBOLS**

2005-27

Environment

**Subsidiary
2009/033**

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

In exercise of the powers conferred upon it by section 18(c) of the Environment Act 2005 the Government has, for the purpose of transposing Directive 2006/7/EC of the European Parliament and of the Council concerning the management of bathing water quality and repealing Directive 76/160/EEC into the law of Gibraltar, made the following Regulations—

**PART 1
PRELIMINARY**

Title and commencement.

1.(1) These Regulations may be cited as the Environment (Quality of Bathing Water) Regulations 2009 and come into operation in accordance with subregulations (2) to (4).

(2) This regulation, and regulations 2 to 6, 10, 12, 13 and 17 come into operation on the day of publication of these Regulations.

(3) Regulations 7 to 9, 11, 24, 26 and 27 come into operation on 24th March 2011.

(4) All remaining regulations come into operation on 24th March 2015.

Interpretation.

2. In these Regulations—

“abnormal situation” means an event or combination of events impacting on bathing water quality which would not be expected to occur, on average, more than once every four years;

“bathing season” means the period determined by the competent authority under regulation 4;

“bathing water” means any surface water designated by the competent authority under regulation 3;

“bathing water quality assessment” means the process of evaluating bathing water quality, using the assessment method defined in regulation 22 ;

“Bathing Water Directive” means Directive 2006/7/EC of the European Parliament and of the Council concerning the management of bathing water quality and repealing Directive 76/160/EEC;

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

“bathing water profile” means the profile established under regulation 7;

“coastal water” means surface water on the landward side of a line every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of the territorial waters is measured;

“competent authority” means the Minister;

“control”, in relation to bathing water, means control of the land immediately adjacent to the beach or bank that is normally used to access the bathing water from the landward side and, where the bathing water is tidal, control of such land above the high water mark;

“controller” means any person or body corporate, whether public or private, who controls bathing water;

“cyanobacterial proliferation” means an accumulation of cyanobacteria including in the form of a bloom, mat or scum;

“groundwater” means all water that is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil;

“inland water” means all standing and flowing water on the surface of the land, and all groundwater on the landward side of the baseline from which the breadth of the territorial waters is measured;

“large number” in relation to bathers, means a number that the competent authority considers to be large having regard, in particular, to past trends or to any infrastructure or facilities provided, or other measures taken, to promote bathing;

“management measures” means the following measures undertaken with respect to bathing water–

- (a) establishing and maintaining a bathing water profile;
- (b) establishing a monitoring calendar;
- (c) monitoring bathing water;
- (d) assessing bathing water quality;
- (e) classifying bathing water;

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

- (f) identifying and assessing causes of pollution that might affect bathing waters and impair bathers' health;
- (g) giving information to the public;
- (h) taking action to prevent bathers' exposure to pollution; and
- (i) taking action to reduce the risk of pollution;

“Minister” means the Minister with responsibility for the environment;

“permanent advice against bathing” means advice issued, in relation to at least one whole bathing season, under regulation 25;

“permanent bathing prohibition” means a prohibition on bathing, in relation to at least one whole bathing season, under regulation 25;

“pollution” means contamination that affects bathing water quality and presents a risk to bathers’ health from the following—

- (a) intestinal enterococci;
- (b) *Escherichia coli*;
- (c) cyanobacterial proliferation;
- (d) a proliferation of macro-algae or marine phytoplankton; or
- (e) other pollution, including tarry residues, glass, plastic, rubber or any other waste;

“relevant procedures for short-term pollution” means the following procedures for identifying the causes of, predicting, and dealing with, short-term pollution—

- (a) management measures;
- (b) the establishment of surveillance and early warning systems and monitoring, with a view to preventing bathers’ exposure to the short-term pollution by means of a warning or where necessary, a bathing prohibition; and
- (c) measures in relation to bathing water taken by the competent authority under regulation 5 to prevent, reduce or eliminate the causes of the short-term pollution;

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

“set of bathing water quality data” means data obtained from results of samples taken under regulations 12 to 18;

“short-term pollution” means microbiological contamination by intestinal enterococci or *Escherichia coli*, that has clearly identifiable causes, and where contamination to affect bathing water quality for more than approximately 72 hours after the bathing water is first affected would not normally be expected and in respect of which the competent authority has established procedures to predict and deal with such pollution;

“surface water” means inland waters, except groundwater; transitional waters and coastal waters except in respect of chemical status for which it shall also include territorial waters;

“Water Framework Directive” means Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy.

(2) The Minister may designate any person or body to carry out any function or functions vested in him as the competent authority under these Regulations, and references to the competent authority in these Regulations includes a reference to any such person or body.

Designation of bathing waters.

3.(1) Subject to regulation 6, the competent authority shall establish, and keep annually under review, a list of bathing waters in Gibraltar designated under this regulation.

(2) The competent authority shall designate an area of surface water as bathing water if—

- (a) he expects a large number of people to bathe there, having regard, in particular, to-
 - (i) past trends; or
 - (ii) infrastructure or facilities provided, or other measures taken, to promote bathing there ; and
- (b) a permanent bathing prohibition or permanent advice against bathing there has not been issued.

(3) Subregulation (2) does not apply to—

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009****Subsidiary
2009/033**

- (a) swimming pools;
- (b) spa pools;
- (c) confined waters which are—
 - (i) subject to treatment such as disinfection; or
 - (ii) used for therapeutic purposes;
- (d) artificially created confined waters separated from surface water or groundwater.

(4) The competent authority may—

- (a) subdivide existing bathing waters in the light of the bathing water quality assessments carried out under regulation 22; or
- (b) group together existing bathing waters in the light of those assessments where those bathing waters—
 - (i) are contiguous;
 - (ii) have received similar such assessments for the preceding four years; and
 - (iii) have bathing water profiles which identify common pollution risk factors.

(5) The competent authority shall publish and update the list of bathing waters designated under this regulation.

Determination of the length of the bathing season.

4.(1) The competent authority shall determine the length of the bathing season for every year in Gibraltar.

(2) The bathing season referred to in subregulation (1) is the period during which the competent authority expects large numbers of people to bathe in bathing waters having regard to the indicators set out in paragraph (a) of regulation 3 (2).

General duties.

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

5.(1) The competent authority or any person or body designated by the Minister under regulation 2(2) shall exercise their functions so as to secure compliance with the requirements of the Bathing Water Directive.

(2) Any person or body designated by the Minister under regulation 2(2) shall promptly provide to the Minister—

- (a) such information about the quality of bathing waters as the Minister may by notice reasonably require; and
- (b) any information relevant to the carrying out of functions relevant to bathing water under these Regulations or other provisions of law for the time being in force which the Minister has not delegated to the person.

Public participation.

6.(1) The competent authority shall—

- (a) encourage public participation in the implementation of these Regulations; and
- (b) ensure that the public has an opportunity—
 - (i) to find out how to participate; and
 - (ii) to submit suggestions, comments or complaints,

in particular in relation to the establishment, review and updating of lists of bathing waters.

(2) The competent authority shall take due account of any information that it has obtained from the public when exercising its functions under these Regulations.

**PART 2
BATHING WATER PROFILES****Bathing water profiles.**

7.(1) The competent authority shall establish and keep under review a bathing water profile for every bathing water in Gibraltar in accordance with regulations 8 and 9.

(2) The competent authority may combine the bathing water profiles of contiguous bathing waters.

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

(3) When complying with subregulation (1), the competent authority shall take into account the data which it has obtained or analysed under the Public Health (Water Framework) Rules 2004.

Contents of the bathing water profile.

8.(1) Every bathing water profile shall–

- (a) contain a description of the physical, geographical and hydrological characteristics of–
 - (i) the bathing water; and
 - (ii) any other surface water in the catchment area of the bathing water concerned where the surface water could be a source of pollution for the bathing water;
- (b) identify and assess the causes of pollution that might affect bathing water quality and pose a risk to bathers' health;
- (c) assess the potential for cyanobacterial proliferation;
- (d) assess the potential for the proliferation of macro-algae or phytoplankton;
- (e) if the assessment under paragraph (b) indicates that there is a risk of short-term pollution and the competent authority has established relevant procedures for short-term pollution, contain–
 - (i) information as to the anticipated nature, frequency and duration of expected short-term pollution;
 - (ii) details of any remaining causes of short-term pollution;
 - (iii) details of the management measures taken to eliminate the causes of the pollution and the time schedule for the elimination of the causes; and
 - (iv) information on relevant procedures for short-term pollution taken during a short-term pollution incident and the identity and contact details of any person responsible for taking such action; and
- (f) identify the location of the monitoring point.

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

(2) The information in subregulation (1)(a) and (b) shall be detailed on a map whenever practicable.

Review of the bathing water profile.

9.(1) Where bathing water is classified as “poor”, “sufficient” or “good” under regulation 23, the competent authority must regularly review, and if necessary update, the bathing water profile to assess whether any of the aspects listed in regulation 8(1) have changed.

(2) The reviews referred to in subregulation (1) shall cover all the aspects listed in regulation 8(1) and shall—

- (a) take into account the nature and severity of the pollution which affects the bathing water; and
- (b) be carried out at the following minimum frequency—
 - (i) “poor” classification, every two years;
 - (ii) “sufficient” classification, every three years; and
 - (iii) “good” classification, every four years.

(3) In the case of bathing waters previously classified as “excellent” in accordance with regulation 23, the competent authority must review, and if necessary update, the bathing water profile only if the classification changes to “poor”, “sufficient” or “good”. The review shall cover all the aspects listed in regulation 8 (1).

(4) Where there are significant construction works or infrastructure changes in or around bathing water, the competent authority shall review the bathing water profile before the start of the next bathing season.

(5) The competent authority may include or attach any information to a bathing water profile if the competent authority considers it appropriate to do so.

**PART 3
MONITORING OF BATHING WATERS****Monitoring of bathing waters.**

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009****Subsidiary
2009/033**

10.(1) The competent authority shall establish a monitoring programme for bathing waters in Gibraltar.

(2) The monitoring programme for—

- (a) intestinal enterococci and *Escherichia coli* shall be in accordance with regulations 12 to 18;
- (b) cyanobacteria shall be in accordance with regulation 19; and
- (c) other pollution, including tarry residues, glass, plastic, rubber or any other waste shall be in accordance with regulation 20.

(3) The competent authority shall undertake investigations for macro-algae and marine phytoplankton in accordance with regulation 21.

Public information.

11.(1) Subregulation (2) applies in relation to every bathing water in Gibraltar.

(2) Every person who controls bathing water, shall ensure that the following information about bathing water that he controls is actively disseminated and promptly made available to the public during the bathing season in an easily accessible place in the near vicinity of each bathing water—

- (a) the bathing water's current classification in accordance with regulation 23, where such a classification has taken place and any bathing prohibition or advice against bathing as referred to in this Regulation by means of a clear and simple sign or the relevant symbol in Schedule 2;
- (b) a general description of the bathing water, in non-technical language, based on its bathing water profile;
- (c) in the case of bathing water subject to short term-pollution—
 - (i) notification that the bathing water is affected by short-term pollution;
 - (ii) an indication of the number of days for which advice against bathing was introduced there during the immediately preceding bathing season because of short-term pollution;

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

- (iii) a warning whenever short-term pollution is predicted or present there;
- (d) information on the nature and expected duration of abnormal situations during such events; and
- (e) whenever bathing is prohibited or advised against, a notice advising the public and giving reasons;
- (f) whenever a permanent bathing prohibition or permanent advice against bathing is introduced, the fact that the area in question is no longer a bathing water and the reasons for its declassification; and
- (g) an indication of the sources of more complete information in accordance with subregulation (5).

(3) Every person who controls bathing water, shall ensure he uses appropriate media and technologies, including the Internet, to disseminate actively and promptly the information concerning bathing waters referred to in subregulation (2) and also the following information in several languages, where appropriate—

- (a) a list of bathing waters;
- (b) the classification of each bathing water over the last 3 years and its bathing water profile, including the results of monitoring carried out in accordance with these Regulations since the last classification;
- (c) in the case of bathing waters classified as being 'poor', information on the causes of pollution and measures taken with a view to preventing bathers' exposure to pollution and to tackle its causes as referred to in regulation 25(1); and
- (d) in the case of bathing waters subject to short-term pollution, general information on—
 - (i) conditions likely to lead to short-term pollution,
 - (ii) the likelihood of such pollution and its likely duration,
 - (iii) the causes of the pollution and measures taken with a view to preventing bathers' exposure to pollution and to tackle its causes.

Environment**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009****Subsidiary
2009/033**

(4) The list referred to in subregulation (3)(a) shall be available each year before the start of the bathing season.

(5) The results of the monitoring referred to in subregulation (3)(b) shall be made available on the Internet upon completion of the analysis.

(6) Wherever possible, the competent authority shall ensure that information provided to the public uses geo-referenced technology and is presented in a clear and coherent manner, in particular through the use of signs and symbols.

Location of monitoring point.

12. The competent authority shall—

- (a) locate the monitoring point at every bathing water where—
 - (i) most bathers are expected; or
 - (ii) the greatest risk of pollution is expected, according to the bathing water profile; and
- (b) where possible, take samples 30 centimetres below the water's surface and in water that is at least one metre deep.

Monitoring calendar.

13.(1) The competent authority shall—

- (a) establish a monitoring calendar for every bathing water before the start of every bathing season; and
- (b) take samples at every bathing water no later than four days after the date specified in the monitoring calendar.

(2) In relation to abnormal situations—

- (a) the competent authority may suspend the monitoring calendar for the duration of the situation; and
- (b) as soon as possible after the end of the situation, the competent authority shall take sufficient additional samples to replace those missing due to the suspension and to ensure that it has the minimum number required for the bathing water for the bathing season.

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009*****Frequency of monitoring.***

14. *The competent authority shall—*

- (a) *take and analyse at least four samples from every bathing water during every bathing season;*
- (b) *take the first such sample for every bathing season shortly before the start of that season; and*
- (c) *take samples from every bathing water throughout the bathing season at intervals not exceeding one month.*

Short-term pollution.

15.(1) *Where, having consulted the person or the controller who controls bathing water, the competent authority has established relevant procedures for short-term pollution there, the competent authority may exclude samples taken during short-term pollution from the set of bathing water quality data for the bathing water and replace those with samples taken under this regulation.*

(2) *As soon as possible after the end of a short-term pollution incident, the competent authority shall take one additional sample in order to verify that the incident has ended.*

(3) *The competent authority shall not include the sample taken under subregulation (2) in the set of bathing water quality data for bathing water.*

(4) *Seven days after the end of a short-term pollution incident, the competent authority shall, if necessary, take an additional sample to ensure that it has the minimum number required for the bathing water for the bathing season.*

Sampling equipment.

16.(1) *The competent authority shall only use sampling bottles which—*

- (a) *have been—*
 - (i) *sterilised in an autoclave for at least 15 minutes at 121°C;*
 - (ii) *dry sterilised at between 160°C and 170°C for at least one hour; or*

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

(iii) *irradiated by their manufacturer and not used before;*

(b) *are of a size which allows sufficient water to be taken and analysed for the presence of Intestinal enterococci and Escherichia coli; and*

(c) *are made of transparent and colourless material.*

(2) *The competent authority shall—*

(a) *use aseptic technique to maintain the sterility of the sample bottles; and*

(b) *clearly identify every sample taken by marking in indelible ink the sample bottle and associated paperwork.*

Storage and transport of samples before analysis.

17.(1) The competent authority shall, at all times, protect every sample taken from exposure to light, and in particular, direct sunlight.

(2) The sample shall be conserved at a temperature of around 4°C, in a cool box or refrigerator (depending on climate) until arrival at the laboratory and if the transport to the laboratory is likely to take more than four hours, then a refrigerator must be used in transporting the sample.

(3) The time between sampling and analysis is to be kept as short as possible and samples must be analysed on the same working day, if possible.

(4) If, for practical reasons, the samples cannot be analysed on the same working day, then the samples shall be processed within no more than 24 hours and, in the meantime, they shall be stored in the dark and at a temperature of 4 °C ± 3 °C.

Reference methods of analysis.

18.(1) *Subject to subregulation (2), the competent authority shall use the following reference methods of analysis—*

(a) *for intestinal enterococci, ISO 7899-1 or ISO 7899-2; and*

(b) *for Escherichia coli, ISO 9308-3 or ISO 9308-1,*

and shall adhere to the provisions in regulations 12(b), 16 and 17 when handling samples for analysis.

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

(2) *The competent authority may permit the use of other methods or rules other than those described in subregulation (1) if it can be demonstrated that the results obtained are equivalent to those obtained*

(3) *Where subregulation (2) is applied so as to permit the use of such equivalent methods or rules, the competent authority shall provide the Commission with all relevant information about the methods or rules used and their equivalence.*

Cyanobacteria.

19.(1) *Where any bathing water profile indicates a potential for cyanobacterial proliferation, the competent authority shall establish a monitoring programme at the bathing water at the frequency necessary to allow timely identification of the risks.*

(2) *Where cyanobacterial proliferation occurs and a health risk has been identified or presumed, the competent authority shall immediately undertake adequate management measures to be put in place in accordance with regulation 24, including providing information to the public.*

Other Pollution.

20. *The competent authority shall establish a visual monitoring programme for pollution such as tarry residues, glass, plastic, rubber or any other waste at every bathing water at the frequency necessary to allow adequate management measures to be put in place in accordance with regulation 24, including, if necessary, providing information to the public.*

Macro-Algae and Marine Phytoplankton.

21. *Where any bathing water profile indicates a tendency for proliferation of macro-algae, marine phytoplankton or both, the competent authority shall undertake an investigation at the bathing water to determine their acceptability and health risks and to allow for adequate management measures to be put in place in accordance with regulation 24, including providing information to the public.*

PART 4**BATHING WATER ASSESSMENT AND CLASSIFICATION*****Bathing Water Quality Assessment.***

22.(1) *After the end of every bathing season, for every bathing water in Gibraltar, the competent authority shall—*

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

- (a) *prepare a set of bathing water quality data for that season;*
- (b) *carry out a bathing water quality assessment using the set of bathing water quality data compiled in relation to that season and the relevant assessment period; and*
- (c) *follow the procedure set out in paragraph 3 of Schedule 1.*

(2) *In this regulation, the “relevant assessment period” is–*

- (a) *the immediately preceding three bathing seasons;*
- (b) *the immediately preceding two bathing seasons, where the competent authority so determines in accordance with subregulation (3); or*
- (c) *the number of immediately preceding bathing seasons, being less than three, that the competent authority determines in accordance with subregulation (4).*

(3) *The competent authority may make a determination under subregulation (2)(b) where it is at least five years since the last change in the relevant assessment period.*

(4) *The competent authority may make a determination under subregulation (2)(c), where–*

- (a) *the set of bathing water quality data used is based on at least 16 samples; and*
- (b) *one of the conditions in subregulation (5) is met.*

(5) *For the purposes of subregulation (4)(c), the conditions are–*

- (a) *the competent authority designated the bathing water under regulation 3 less than four bathing seasons ago; or*
- (b) *the competent authority considers that any factors identified in the bathing water profile as likely to affect the classification of the bathing water under regulation 23 have changed, and the set of bathing water quality data used is based only on samples taken since those factors have changed.*

Classification.

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

23.(1) *As from the end of the 2015 bathing season, the competent authority shall classify every bathing water in Gibraltar as “poor”, “sufficient”, “good” or “excellent” in accordance with the provisions of these Regulations.*

(2) *As from the end of the 2015 bathing season, the competent authority shall ensure that all bathing waters in Gibraltar are classified as “sufficient” in accordance with the provisions of these Regulations and it shall take such realistic and proportionate measures as it considers appropriate with a view to increasing the number of bathing waters in Gibraltar classified as, at least, “excellent” or “good”.*

**PART 5
MANAGEMENT OF BATHING WATERS**

Management measures at bathing waters subject to pollution incidents.

24.(1) This regulation applies where the competent authority, or the controller in relation to bathing water in Gibraltar, is aware of–

- (a) a cyanobacterial proliferation which it considers may pose a risk to bathers’ health;
- (b) a proliferation of macro-algae or marine phytoplankton which it considers is unacceptable or may pose a risk to bathers’ health;
- (c) the presence of other pollution, including tarry residues, glass, plastic, rubber or any other waste; or
- (d) any other incident, other than an incident of short-term pollution but including unexpected situations, that it considers may pose a risk to bathing water quality and bathers’ health.

(2) The competent authority shall promptly–

- (a) notify–
 - (i) the controller of the bathing water, if the competent authority itself does not exercise control over the bathing water; and
 - (ii) where necessary, the sewerage undertaker; and
- (b) take, or cause to be taken, such management measures as it considers adequate to protect bathers’ health including

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

information to the public and, if necessary, a temporary bathing prohibition.

(3) The controller shall promptly—

- (a) consult the competent authority if the controller is a person or body other than the Government;
- (b) where necessary, notify the sewerage undertaker;
- (c) take such management measures there as he considers adequate to protect bathers' health; and
- (d) where necessary, remove the other pollution.

Additional management measures at “poor” bathing waters.

25.(1) *Notwithstanding the requirements of regulation 23(2), bathing waters may be temporarily classified as “poor” and still remain in compliance with these Regulations if the following conditions are satisfied—*

- (a) *in respect of each bathing water classified as “poor” the competent authority shall during the bathing season following this classification—*
 - (i) *take, or cause to be taken, adequate management measures, including a bathing prohibition or advice against bathing with a view to preventing bathers' exposure to pollution;*
 - (ii) *notify the controller of the bathing water, if the competent authority itself does not exercise control over the bathing water; and*
 - (iii) *identify the causes and reasons why the bathing water failed to achieve a classification of “sufficient”;*
 - (iv) *take adequate measures to prevent, reduce or eliminate the cause of pollution;*
- (b) *the controller shall—*
 - (i) *take such management measures there as he considers adequate with a view to preventing bathers' exposure to pollution; and*

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

(ii) *in accordance with regulation 11, alert the public by a clear and simple warning sign and informing them of the causes of the pollution and the measures taken, on the basis of the bathing water profile.*

(2) *Where the competent authority has classified bathing water as “poor” under regulation 23 for five consecutive years the controller shall introduce a permanent bathing prohibition or issue permanent advice against bathing there, and the competent authority may introduce the prohibition or issue the advice where it considers that it would be unfeasible or disproportionately expensive for that bathing water to achieve a classification of “sufficient”.*

(3) *The competent authority shall notify the controller of the bathing water, if the competent authority itself does not exercise control over the bathing water.*

(4) *The controller shall introduce permanent bathing prohibition or permanent advice against bathing there by means of public information under regulation 11.*

Relevant procedures for short-term pollution.

26.(1) This regulation applies where—

- (a) having consulted the controller of the bathing water concerned, or considered his own duties as controller, the competent authority has established relevant procedures for short-term pollution at the bathing water; and
- (b) there is a short-term pollution there.

(2) The competent authority shall operate, or cause to be operated, the relevant procedures for short-term pollution for which it is responsible.

(3) The controller shall take the management measures that form part of the relevant procedures for short-term pollution there.

Enforcement.

27.(1) Where the Minister delegates any powers under these Regulations to any person, he shall be entitled to take the use of such powers into his own hands if he reasonably believes it to be advantageous.

(2) Without prejudice to such public law remedies as are available on the unreasonable exercise of power, any agreement under which the Minister

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**
**Subsidiary
2009/033**

delegates any powers under these Regulations may include provision to facilitate him monitoring the use of those powers and giving directions to the holders of those powers.

(3) A person commits an offence if that person bathes in any water where—

- (a) bathing is prohibited under these Regulations; and
- (b) the prohibition was reasonably obvious to any potential bather by means of signs, cordons, red flags or other such means,

and that person is liable on summary conviction to a fine on level 1 on the standard scale.

(4) A private controller of any water shall be guilty of an offence and liable on summary conviction to a fine not exceeding level 2 on the standard scale, if any person bathes in such water after bathing has been prohibited under these Regulations, unless reasonable steps had been taken (whether by the controller or otherwise) as would have prevented a reasonable person from bathing, including the use of such warnings as signs, cordons and red flags.

Liability of bodies corporate - general.

27A.(1) A corporate body shall be liable for an offence under these Regulations where that offence is committed for its benefit by a person, acting either individually or as part of an organ of the corporate body, who has a leading position within the corporate body.

(2) For the purposes of subregulation (1), a leading position shall be deemed to exist where such a person has—

- (a) a power of representation of the corporate body;
- (b) an authority to take decisions on behalf of the corporate body;
or
- (c) an authority to exercise control within the corporate body.

(3) A corporate body shall be liable for an offence under these Regulations committed by a person referred to in subregulation (1) where lack of supervision or control by that person has made possible the commission of the offence for the benefit of the corporate body by a person under its authority.

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

(4) Where a corporate body is guilty of an offence under these Regulations and that offence is proved to have been committed with the consent or connivance of, or to be attributable to any neglect on the part of, any person referred to in subregulation (1), or any person who was purporting to act in any such capacity, that person, as well as the corporate body, shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

(5) Where the affairs of a corporate body are managed by its members, subregulation (4) shall apply in relation to the acts and defaults of a member in connection with his functions of management as if he were a director of the corporate body.

(6) A fine imposed on an unincorporated association on its conviction for an offence shall be paid out of the funds of the association.

(7) Where an offence under these Regulations committed by a partnership is proved to have been committed with the consent or connivance of or to have been attributable to any neglect on the part of a partner he as well as the partnership is guilty of the offence and liable to be proceeded against and punished accordingly.

Reporting procedures.

28.(1) Reports shall be prepared by the competent authority in accordance with the requirements of Article 13 of the Bathing Water Directive and shall be submitted to the European Commission annually before the end of the calendar year in relation to the bathing season for that year.

(2) The competent authority shall, every year before the start of the bathing season, notify the European Commission of all waters in Gibraltar identified as bathing waters, including, where relevant, the reason for any change in classification compared to the preceding year.

(3) Where the monitoring calendar has been suspended this shall be reported to the European Commission, giving reasons for the suspension, at the same time as the next annual report is made under subregulation (1).

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

**Subsidiary
2009/033**
SCHEDULE 1

Regulation 23

CLASSIFICATION**Standards.**

1. The competent authority shall use the following standards for classification—

Standards for inland waters

<i>Parameter</i>	<i>“Excellent”</i>	<i>“Good”</i>	<i>“Sufficient”</i>
<i>Intestinal enterococci⁽¹⁾</i>	200 ⁽²⁾	400 ⁽²⁾	330 ⁽³⁾
<i>Escherichia coli⁽¹⁾</i>	500 ⁽²⁾	1,000 ⁽²⁾	900 ⁽³⁾

⁽¹⁾ Colony forming units per 100 millilitres (“cfu/100 ml”).

⁽²⁾ Based upon a 95-percentile evaluation – see paragraph 2.

⁽³⁾ Based upon a 90-percentile evaluation – see paragraph 2.

Standards for coastal and transitional waters

<i>Parameter</i>	<i>“Excellent”</i>	<i>“Good”</i>	<i>“Sufficient”</i>
<i>Intestinal enterococci⁽¹⁾</i>	100 ⁽²⁾	200 ⁽²⁾	185 ⁽³⁾
<i>Escherichia coli⁽¹⁾</i>	250 ⁽²⁾	500 ⁽²⁾	500 ⁽³⁾

⁽¹⁾ Colony forming units per 100 millilitres (“cfu/100 ml”).

⁽²⁾ Based upon a 95-percentile evaluation – see paragraph 2.

⁽³⁾ Based upon a 90-percentile evaluation – see paragraph 2.

Methodology.

2.(1) In this Schedule, “percentile value” is based on a percentile evaluation of the \log_{10} normal probability density function of microbiological data acquired from the bathing water used for the assessment under regulation 22.

(2) The competent authority shall derive a percentile value as follows—

(a) either—

(i) take the \log_{10} value of all bacterial concentrations in the data sequence to be evaluated; or

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

- (ii) *where the value under paragraph (a)(i) is zero, take the \log_{10} value of the minimum detection limit of the analytical method used;*
 - (b) *calculate the arithmetic mean (“m”) of the \log_{10} value taken under subparagraph (a);*
 - (c) *calculate the standard deviation (“s”) of the \log_{10} value taken under paragraph (a)*
 - (d) *derive the upper 90-percentile point of the data probability density function from the following equation: upper 90-percentile = antilog ($m + 1.282s$); and*
 - (e) *derive the upper 95-percentile point of the data probability density function from the following equation: upper 95-percentile = antilog ($m + 1.65s$).*
- (3) *Where bathing water is subject to short-term pollution incidents, it may only be classified under sub-paragraph 3 below as “sufficient”, “good” or “excellent” if–*
- (a) *having consulted the person or private controller who, controls the bathing water, the competent authority has established relevant procedures for short-term pollution there; and*
 - (b) *the number of samples disregarded under regulation 16(1) represents no more than the greater of either–*
 - (i) *15 per cent of the total number of samples provided for in the monitoring calendars established under regulation 13 for the same period; or*
 - (ii) *one sample per bathing season.*

Classification.

3.(1) *At the end of every bathing season, the competent authority shall classify bathing water as “poor” if, in the set of bathing water quality data used, the percentile values for microbiological concentrations are higher than the “sufficient” standards set out in paragraph 1 of this Schedule.*

(2) *At the end of every bathing season, the competent authority shall classify bathing water as “sufficient” if–*

Environment

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009****Subsidiary
2009/033**

- (a) *in the set of bathing water quality data, the percentile values for microbiological concentrations are equal to or lower than the “sufficient” standards set out in paragraph 1; and*
- (b) *the bathing water is not classifiable as “good” or “excellent”.*
- (3) *At the end of every bathing season, the competent authority shall classify bathing water as “good” if–*
- (a) *in the set of bathing water quality data, the percentile values for microbiological concentrations are equal to or lower than the “good” standards set out in paragraph 1; and*
- (b) *the bathing water is not classifiable as “excellent”.*
- (4) *At the end of every bathing season, the competent authority shall classify bathing water as “excellent” if, in the set of bathing water quality data used, the percentile values for microbiological concentrations are equal to or lower than the “excellent” standards set out in paragraph 1.*

**ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009**

SCHEDULE 2

SYMBOLS

Symbols for informing on bathing prohibition or advice against bathing—



Environment

ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009

Subsidiary
2009/033

Symbols for informing on bathing water classification–



ENVIRONMENT (QUALITY OF BATHING WATER)
REGULATIONS 2009

Subsidiary
2009/033



**Sufficient
bathing water quality**

★ ★ ★ Excellent
★ ★ Good
★ Sufficient
— Poor



**Poor
bathing water quality**

★ ★ ★ Excellent
★ ★ Good
★ Sufficient
— Poor

Town Planning Act 1999

TOWN PLANNING ACT 1999**Principal Act**

Act. No. 1999-39	<i>Commencement</i>	5.4.2001
	<i>s.2, 23 and 44.</i>	17.2.2000
	<i>Assent</i>	2.12.1999

Amending enactments	Relevant current provisions	Commencement date
2000-11	s. 5(2)(n) and 22(2)(kk)	30.11.2000
2003-19	s. 22A	1.8.2003
2004-08	s. 1(3) and 2	4.3.2004
2009-30	ss. 2, 5(2A) & (2B), 22(2A) & (2B) & 22B	6.8.2009
LN. 2011/237	Sch. 1	22.12.2011
Act. 2014-01	s. 38	27.2.2014

English sources

None cited

EU Legislation/International Agreements involved:

Directive 96/82/EC

Directive 2003/105/EC

1999-39

Town Planning

ARRANGEMENT OF SECTIONS**PART I***Preliminary*

Section

1. Title and Commencement.
2. Interpretation.

PART II*Development and Planning Commission*

3. Establishment of Commission.
4. Functions of Commission.

PART III*Planning Schemes*

5. Contents of planning schemes and powers of Commission.
6. Exhibition of schemes.
7. Consideration of objections.
8. Amendment of schemes otherwise than upon objection.
9. Submission of schemes to Chief Minister.
10. Powers of Chief Minister.
11. Refusal of schemes.
12. Deposit of copies of approved schemes.
13. Revocation, replacement and amendment of approved schemes.
14. Revision of approved schemes.
15. Approved schemes to serve as standards.

PART IV*Building Control*

16. Meaning of “development” and requirement of planning permission.
17. Applications for permits.
18. Outline planning permission.
19. Publication of notices of applications.
20. Modification of applications on direction from Commission.
21. Notification of applications to owners and other persons.
22. Grant and refusal of permits.
- 22A. Large Combustion Plants.
- 22B. Notification of dangerous substances.
23. Directions etc. as to method of dealing with applications.
24. Appeal against decision of Commission.
25. Appeal in default of planning decision.
26. Permission to retain buildings or works or continue use of land.

1999-39

Town Planning

27. Enforcement Orders.
28. Power of Commission to demolish building.
29. Inspection of premises.
30. Provisions as to effect of permit.
31. Registers of applications and decisions.
32. Termination of permit by reference to time limit: completion notices.
33. Effect of completion notice.
34. Power to modify permit.
35. Procedure on modification orders where objections received.
36. Procedure on modification orders where no objections received.

PART V

Preservation of Amenities

37. Notices for preservation of amenities.
38. *Repealed.*
39. Control of advertisements.
40. Stoppage orders.
41. Appeal against stoppage order.

PART VI

Miscellaneous

42. Signature and authentication of documents.
43. Penalty.
44. Regulations.
45. Amendment of Schedules.
46. Saving.
47. Transitional provisions.
48. Repeal.

SCHEDULE 1

Development and Planning Commission

SCHEDULE 2

Development Appeals Tribunal

PART I*Preliminary***Title and Commencement.**

1.(1) This Act may be cited as the Town Planning Act 1999.

(2) This Act shall come into operation on such day as the Minister may, by notice in the Gazette, appoint and different days may be appointed for different provisions and different purposes.

(3) This Act applies to the land, sea and sea-bed of Gibraltar.

Interpretation.

2. In this Act and unless the context otherwise provides –

“advertisement” means any word, letter, model, sign, placard, board, notice, device or representation, whether illuminated or not, in the nature of, and employed wholly or in part for the purposes of, advertisement, announcement or direction, and includes any hoarding or similar structure used or adapted for use for the display of advertisements;

“approved planning scheme” means a planning scheme approved by the Chief Minister under section 10;

“building” includes any structure or erection and any part of a building as so defined, but does not include plant or machinery other than externally mounted air-conditioning cooling plant or ventilation ducts;

“Commission” means the Development and Planning Commission constituted under section 3;

“dangerous substance” means a substance, mixture or preparation–

- (a) listed in column 1 of Part 2 of Schedule 6 of the Public Health Act; or
- (b) within a category specified in column 1 of Part 3 of Schedule 6 of the Public Health Act, and present as a raw material, product, by-product, residue or intermediate;

1999-39

Town Planning

“Directive” means the Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances as amended by Directive 2003/105/EC;

“land” means any corporeal hereditament including a building and where the context so admits shall include the sea and sea-bed;

“Minister” means the Minister with responsibility for Town Planning or such other Minister as the Chief Minister may designate from time to time;

“operator” shall be construed in accordance with section 95A(2) of the Public Health Act;

“planning scheme” means any plan or plans prepared under the direction of the Commission under section 5, and includes any written statement or explanation forming part thereof;

“Tribunal” means the Development Appeals Tribunal appointed under section 24(2);

“zone” means any area of land shown on the plan of a planning scheme by distinctive colouring, hatching or edging for the purposes of indicating the use to which the land and buildings may be put.

PART II

Development and Planning Commission

Establishment of Commission.

3.(1) There shall be established a Commission, to be known as the Development and Planning Commission.

(2) The provisions contained in Schedule 1 shall have effect with respect to the functions, constitution and proceedings of the Commission* .

Functions of Commission.

4. The Commission shall—
- (a) with a view to the promotion of the health, safety, convenience, physical, economic and general welfare of the community, undertake the preparation of planning schemes for the physical

* LN 2001/028 Establishes the Development and Planning Commission.

development of such areas as the Government may direct, as well as for the type of buildings suitable for erection therein;

- (b) carry out the functions conferred or imposed upon it by any statute for the time being in force, and such other functions as the Government may from time to time prescribe.

PART III

Planning Schemes

Contents of planning schemes and powers of Commission.

5.(1) A planning scheme shall consist of a written statement, with a plan or plans, indicating—

- (a) the principal physical and economic characteristics of each area to which it relates;
 - (b) the size, composition and distribution of the population of that area (whether resident or otherwise);
 - (c) the manner in which land may be used, and the stages by which any development of land may be carried out.
- (2) A planning scheme may make provision for—
- (a) new streets, roads and alleys and the diversion, widening, alteration and stopping-up of existing streets, roads and alleys;
 - (b) the establishment of building lines and lay-bys;
 - (c) water supply, drainage and sewerage ;
 - (d) the demarcation of zones within which commerce or industries may be carried on, or which are reserved exclusively for residential or other purposes;
 - (e) the imposition of conditions or restrictions in regard to the size of any plot of land upon which any building may be erected, the open space to be maintained about a building, the density of the built environment, and the height, size or character of any building to be allowed in any zone or specified area;
 - (f) the demarcation of land for parks, recreation grounds, nature reserves, water catchments and other public purposes;

1999-39

Town Planning

- (g) the provision of car parks and the reservation of sites for multi-storey car parks;
- (h) the transport system and traffic arrangements;
- (i) access to the water front by the general public;
- (j) marinas, port facilities, and such warehouses and areas adjoining thereto, as may be expected to affect such facilities;
- (k) the comprehensive development of any area;
- (l) the demarcation of areas for the preservation and restoration of buildings;
- (m) the demarcation of sites of archaeological or historical or similar interest (including ancient monuments and other buildings or sites protected by law); and
- (n) ensuring the prevention of major accidents and limiting the consequences of such accidents.

(2A) In the preparation of a planning scheme, the Commission shall, in addition to the matters specified in subsection (2), have regard to the need—

- (a) in the long term, to maintain appropriate distances between establishments and residential areas, buildings and areas of public use, major transport routes as far as possible, recreational areas and areas of particular sensitivity or interest; and
- (b) in the case of existing establishments, for additional technical measures in accordance with Article 5 of the Directive so as not to increase the risks to people.

(2B) In subsection (2A), “establishment” means the whole area under the control of the same person where dangerous substances are present in one or more installations, and for this purpose two or more areas under the control of the same person and separated only by a road shall be treated as one whole area.

(3) A planning scheme may define as an area of comprehensive development any area that, in the opinion of the Town Planner, works should be developed or redeveloped as a whole, for any one or more of the following purposes, that is to say—

- (a) for the purpose of dealing satisfactorily with conditions of bad lay-out or obsolete development;
- (b) for the purpose of providing for the relocation of population or industry or the replacement of open space in the course of the development or redevelopment of any other area; or
- (c) for any other purpose specified in the scheme.

Exhibition of schemes.

6.(1) This section applies to any planning scheme, prepared by or under the direction of the Commission, which the Commission deems suitable for publication.

(2) A planning scheme to which this section applies shall be exhibited by the Commission for public inspection for a period of two months.

(3) Where a planning scheme to which this section applies is exhibited pursuant to subsection (2) above, the Commission shall advertise once a week in a newspaper published in Gibraltar and in each issue of the Gazette the place and hours at which such scheme may be inspected.

(4) Where a planning scheme to which this section applies is exhibited pursuant to subsection (2) above, the Commission shall supply a copy thereof to any person on payment of such fee as the Commission may determine.

Consideration of objections.

7.(1) Any person may, within the two months a scheme is exhibited pursuant to section 6, send to the Commission a written statement of his objections to anything appearing in the scheme.

(2) A written statement under subsection (1) above shall set out—

- (a) the nature of, and reasons for, the objection;
- (b) whether the objection would be removed by an alteration of the planning scheme and, if so, the nature of the alteration proposed.

(3) Upon receipt of a written statement of objection under subsection (1) above, the Commission may give preliminary consideration to an objection in the absence of the objector and may propose amendments to the planning scheme to meet the objection.

1999-39

Town Planning

(4) If the Commission proposes an amendment to the planning scheme pursuant to subsection (3) above, it shall give notice in writing of the amendment proposed to the objector by registered post, and may invite the objector to withdraw his objection on the condition that such amendment is made as proposed.

(5) An objector may notify the Commission in writing within fourteen days after service of notice under subsection (4) above that his objection is withdrawn on the condition that the amendment is made as proposed, but if no such notification is received the objection shall continue in force.

(6) Where—

- (a) the Commission does not propose amendments under subsection (3) above;
- (b) an objector does not notify the Commission under subsection (5) above that his objection is withdrawn; or
- (c) an objection was withdrawn under subsection (5) above, but the Commission does not proceed with an amendment proposed under subsection (3) above,

the Commission shall consider the written statement of objection at a meeting of which the objector shall be given not less than fourteen days notice and the objector, or his authorised representative, may attend such meeting and, if he desires, shall be heard.

(7) In any case where an amendment made by the Commission to meet an objection appears to the Commission to affect any land, other than that of the objector, the Commission shall give notice of such amendment by service, advertisement or otherwise as it deems desirable and practicable to the owner of the land in question, and, where such land is held under a lease which has not less than five years to run, to the occupier of the land.

(8) Any owner or occupier who is given notice under subsection (7) above and who objects to the proposed amendment may, within 14 days of receiving such notice, send a statement in writing to the Commission and to the original objector setting out the nature of and reasons for his objection to the amendment.

(9) Any written objection made under subsection (8) above shall be considered at a meeting of the Commission of which all objectors shall be given not less than fourteen days notice, and the objectors or their authorised representatives may attend such meeting and may be heard.

(10) The Commission may reject any objection in whole or in part or may make amendments to the planning scheme to meet such objection and shall forthwith notify all objectors of its decision.

(11) Any person aggrieved by a decision of the Commission on the hearing of an objection may, within 15 days of the notification of the Commission's decision, appeal to the Tribunal in writing who shall determine the same.

(12) The Commission shall, for a period of three weeks, exhibit publicly any amendment made pursuant to subsection (3) above and, during such period, the Commission shall advertise the fact once a week in a newspaper published in Gibraltar and in each issue of the Gazette.

(13) Where a planning scheme to which this section applies is exhibited pursuant to subsection (12) above, the Commission shall supply a copy thereof to any person on payment of such fee as the Commission may determine.

Amendment of schemes otherwise than upon objection.

8.(1) Without prejudice to section 7, the Commission may amend a planning scheme, at any time after exhibition of a planning scheme under section 6 and before approval by the Chief Minister under section 10.

(2) The Commission shall, for a period of three weeks, exhibit publicly any amendment made pursuant to subsection (1) above and, during such period, the Commission shall advertise once a week in a newspaper published in Gibraltar and in each issue of the Gazette the amendments to the scheme and the hours at which such amendment may be inspected.

(3) The Commission shall, on request, supply to any person a copy of an amendment to a planning scheme made under subsection (1) above, on payment of such fee as the Commission may determine.

(4) A person affected by an amendment to a planning scheme made under subsection (1) above, may object within three weeks of the exhibition of the scheme under subsection (2) above in the manner provided by section 7(1) and (2), and the provisions of section 7(3) to (9) shall thereupon apply.

(5) Any person aggrieved by the decision of the Commission on the hearing of an objection under subsection (4) above may, within fifteen days of the notification of the Commission's decision, appeal to the Tribunal in writing.

Submission of schemes to Chief Minister

1999-39

Town Planning

9. After consideration of all objections, the Commission shall submit the planning scheme to the Chief Minister for approval, and shall submit therewith—

- (a) a schedule of the objections (if any) made under section 7 and not withdrawn;
- (b) a schedule of the amendments (if any) made by the Commission with a view to meeting such objections; and
- (c) a schedule of the amendments (if any) made by the Commission under section 8.

Powers of Chief Minister.

10.(1) Upon submission of a planning scheme, the Chief Minister may—

- (a) approve it;
- (b) refuse to approve it ; or
- (c) refer it to the Commission for further consideration and amendment.

(2) A planning scheme which is approved shall be printed and exhibited for public inspection at such place as the Commission may consider suitable, and the fact of such approval and exhibition shall be published in the Gazette.

(3) The Chief Minister may, by notice in the Gazette, correct any omission from, or error in, any approved planning scheme.

(4) The Commission shall, on request, supply to any person a copy of any approved planning scheme on payment of such fee as the Commission may determine.

Refusal of schemes.

11.(1) Where the Chief Minister refuses to approve a planning scheme, notice of such refusal shall be published in the Gazette.

(2) The publication of a notice under subsection (1) above shall not prejudice the right of the Commission to prepare and submit for approval further planning schemes under this Part.

Deposit of copies of approved schemes.

12. Upon a planning scheme receiving approval and any omissions and errors (if any) corrected under section 10(3), a copy thereof certified correct by the Chairman of the Commission, shall be deposited in the offices of the Minister and shall be available for inspection during working hours without payment of any fee.

Revocation, replacement and amendment of approved schemes.

13.(1) The Chief Minister may—

- (a) revoke in whole any approved planning scheme ; or
- (b) refer any approved planning scheme to the Commission for—
 - (i) replacement by a new planning scheme ; or
 - (ii) amendment.

(2) Notification of any revocation or reference under subsection (1) above shall be published in the Gazette and noted by the Town Planner on the copy of the approved planning scheme deposited under section 12.

(3) The following provisions of this section shall apply in cases where the Chief Minister has referred a planning scheme to the Commission pursuant to subsection (1)(b) above.

(4) The Commission shall prepare a replacement planning scheme or shall amend the referred planning scheme, as the case may be.

(5) A planning scheme prepared or amended under subsection (4) above, shall be, exhibited, considered, submitted, and may be approved and deposited in accordance with the foregoing provisions of this Part; and a reference to a planning scheme in sections 5 to 12 shall be construed as referring to a scheme replaced or amended under subsection (4) above.

(6) The Town Planner shall endorse accordingly the copy of the scheme deposited under section 12 which has been replaced or amended.

Revision of approved schemes.

14.(1) At least once in every 5 years after the date on which a planning scheme for any area is approved by the Chief Minister under section 10(1)(a) or, within such other period as the Commission may from time to time allow, the Town Planner shall submit to the Commission a report together with proposals for any alterations or additions to the scheme that appear to him to be required.

(2) Nothing in this section shall prejudice the right of the Town Planner to submit proposals to the Commission for such alterations or additions to any approved planning scheme as appear to the Town Planner to be expedient.

(3) Where, under section 10, a planning scheme is approved with respect to a part of Gibraltar, the period of five years or any other period mentioned in subsection (1) above shall be construed to read from the date on which a planning scheme in respect of the whole of Gibraltar has been approved, without prejudice to subsection (2) above.

Approved schemes to serve as standards.

15. Approved planning schemes shall be used by the Commission and all public officers and bodies as standards for guidance in the exercise of any powers vested in them.

PART IV

Building Control

Meaning of “development” and requirement of planning permission.

16.(1) In this part except where the context otherwise requires—

“development” means the making of any material change in the use of any land, and shall include the carrying out of demolition, building, engineering, mining or other operations in, on, over or under land;

“building operations” means operations normally undertaken by a person carrying on business as a builder in the course of his business, and shall include rebuilding operations, structural alterations of or additions to buildings.

(2) The following operations or uses of land shall not be taken, for the purpose of this Part, to involve development of the land, that is to say—

- (a) the carrying out of any works required for the maintenance or improvement of a road, being works carried out on land within the boundaries of the road;
- (b) the carrying out of any works for the purpose of inspecting, repairing or renewing any sewers, mains, pipes cables or other apparatus, including the breaking open of any street or other land for that purpose;

- (c) the use of any buildings or other land within the curtilage of a dwelling house for any purpose incidental to the enjoyment of the dwelling house as a place of residence;
- (d) the use of any land for the purposes of agriculture or forestry (including afforestation) and the use, for any of those purposes, of any building occupied together with land so used;
- (e) in the case of buildings or other land which are used for a purpose of any class specified in regulations under this section, the use thereof for any other purpose of the same class.

(3) For the avoidance of doubt, it is hereby declared that for the purpose of this Part—

- (a) the use, as two or more separate dwelling houses, of any building previously used as a single dwelling house, involves a material change in the use of the building and of each part thereof which is so used;
- (b) the deposit of refuse or waste materials on land involves a material change in the use thereof, notwithstanding that the land is comprised in a site already used for that purpose, if either—
 - (i) the superficial area of the deposit is thereby extended; or
 - (ii) the height of the deposit is thereby extended and exceeds the level of the land adjoining the site:

Provided that the deposit of refuse or waste materials on land shall not be deemed to involve a material change in the use of the land if it arises only as a result of prescribed circumstances.

(4) Subject to the provisions of this section and to any exemptions which may be prescribed under section 44, any person who, except under the authority of a permit granted by the Commission, and in accordance with such conditions as may be imposed by the Commission in granting the permit, and with the provisions of any regulations made under section 44, carries out any development shall be guilty of an offence.

(5) Where, on the date of coming into force of this Act, (hereinafter referred to as “the appointed day”) any building or land was being used temporarily for a purpose other than the purpose for which it was normally used, a permit from the Commission shall not be required for the resumption of the use of the building or land for the last-mentioned purpose.

(6) Where, on the appointed day, any building or land was normally used for one purpose and was also used on such occasions as may be approved by

Town Planning

the Commission, whether at regular intervals or not, a permit from the Commission shall not be required for the use of the building or land for that other purpose on similar occasions.

Applications for permits.

17.(1) Every application for a permit under this Act shall—

- (a) be made to the Commission in such form as may be required by regulations;
- (b) be accompanied by such plans, drawings and specifications as may be prescribed;
- (c) provide such information as may be prescribed for the type of development to which the application relates; and
- (d) be considered taking into account any matters which the Commission thinks relevant.

(2) Every applicant for a permit under this Act shall—

- (a) furnish to the Commission such information and particulars relating to his application as may be specified in a notice served upon him in the prescribed manner; and
- (b) if so required by the Commission, attend before the Commission, in person or by representative, for the purpose of making such explanations relating to his application as the Commission may require.

(3) Notwithstanding anything contained in subsection (1) above, an application for a permit for change of use of any building or land which does not entail the erection, re-erection, demolition or alteration of any building shall not be required to be accompanied by any plans, drawings or specifications but shall be accompanied by a description of the change of use proposed:

Provided that on receipt of an application for change of use of a building the Commission may, if they consider it necessary so to do in deciding whether to permit the change of use, call for plans, drawings and specifications of the building.

Outline planning permission.

18.(1) Prior to applying for a permit under section 17, a person may make an application for outline planning permission to erect any building .

(2) Applications under subsection (1) above shall be made subject to the subsequent approval of the Commission of any matters relating to the siting, design or external appearance, landscaping, or the means of access to the building, in consequence of which, particulars and plans in regard to those matters shall not be required at the time of such outline application.

(3) A person applying for outline planning permission shall comply with the requirements of subsections (3) to (7) of section 19 as if he were applying for a permit.

(4) Outline planning permission may be granted subject as aforesaid (with or without other conditions) or refused:

Provided that where such permission is granted the authority of the Commission shall be required with respect to the matters reserved in the permission as well as under any rules made under section 44 or 45 of the Public Health Act before any work is commenced.

(5) Without prejudice to section 22(8), outline planning permission may be granted subject to conditions stipulating the time within which the development must be commenced if a permit is granted.

(6) Where permission has been granted on an outline application made under subsection (1) above, any subsequent application for a permit shall be made in accordance with section 17 and shall, in addition, contain such details as may be necessary to deal with the matters reserved in the permission.

(7) Any permission granted on an outline application shall, unless the Commission order otherwise at the time of granting permission, expire 3 years after such permission was granted:
Provided that the Commission may, on application, within 28 days of expiry, extend the period of validity of such permission.

Publication of notices of applications.

19.(1) Provision may be made by regulations for designating the classes of development to which this section applies.

(2) A person who has complied with the requirements of subsections (3) to (7) below in connection with his application for outline planning permission under section 18 shall be exempted from complying with those subsections in connection with his subsequent application for a permit, unless the Commission shall otherwise direct.

1999-39

Town Planning

(3) An application for planning permission for development of any class to which this section applies shall not be entertained by the Commission unless it is accompanied—

- (a) by a copy of a notice of the application, in such form as may be prescribed by regulations and by such evidence as may be so prescribed that the notice has been published in the Gazette and in a daily and weekly newspaper published in Gibraltar; and
- (b) by one or other of the following certificates, signed by or on behalf of the applicant, that is to say—
 - (i) a certificate stating that he has complied with subsection (4) below and when he did so; or
 - (ii) a certificate stating that he has been unable to comply with it because he does not have such rights of access or other rights in respect of the land as would enable him to do so, but that he has taken such reasonable steps as are open to him, specifying them, to acquire those rights and has been unable to acquire them.

(4) In order to comply with this section a person shall—

- (a) post a notice on the land, in such form as may be prescribed by regulations, stating the application for planning permission is to be made; and
- (b) leave the notice in position for not less 14 days in a period of not more than one month immediately preceding the making of the application to the Commission.

(5) The said notice must be posted by affixing it firmly to some object on the land, and must be sited and displayed in such a way as to be easily visible and legible by members of the public without going on the said land.

(6) The applicant shall not be treated as unable to comply with subsection (4) above if the notice is, without any fault or intention of his, removed obscured or defaced before the 14 days referred to in subsection (4)(b) above have elapsed, so long as he has taken reasonable steps for its protection and, if need be, replacement and, if he has cause to rely on this subsection, his certificate under subsection (3)(b) above shall state the relevant circumstances.

(7) The notice mentioned in subsection (3)(a) above or required by subsection (4) above shall state the address of the office of the secretary of the Commission where a copy of the application for planning permission, and

of all plans and other documents submitted with it, are open to inspection by the public during working hours during such period as may be specified in the notice, not being a period of less than 21 days beginning with the date on which the notice is published or first posted, as the case may be.

(8) An application for planning permission for any class of development to which this section applies shall not be determined by the Commission before the end of the period of 21 days beginning with the date of the application.

(9) If any person issues a certificate which purports to comply with the requirements of subsection (3)(b) above and which contains a statement which he knows to be false or misleading in a material particular, or recklessly issues a certificate which purports to comply with those requirements and which contains a statement which is false or misleading in a material particular, he shall be guilty of an offence and liable on summary conviction to a fine double that on level 3 of the standard scale.

Modification of applications on direction from the Commission.

20.(1) The Commission may, on giving preliminary consideration to an application for planning permission, give directions to the applicant to submit such modifications to the application as it thinks necessary or desirable before the application is entertained by the Commission.

(2) On giving a direction under subsection (1) above, the Commission may, depending on the nature and extent of the required modification, require the applicant to re-comply with the requirements of sections 19(2) to (6) with regard to the modified application.

(3) A failure by an applicant to modify his application as directed by the Commission shall be considered by the Commission as grounds for the refusal of a permit.

Notification of applications to owners and other persons.

21.(1) Without prejudice to section 19, the Commission shall not entertain any application for planning permission unless it is accompanied by one of the following certificates signed by or on behalf of the applicant—

- (a) a certificate stating that the applicant is an owner of the land to which the application relates;
- (b) a certificate stating that the applicant has given the requisite notice of the application to all the persons (other than the applicant) who, at the beginning of the period of twenty-one

1999-39

Town Planning

days ending with the date of the application, were owners of the land to which the application relates; and stating—

- (i) the names of those persons;
 - (ii) the addresses at which notice of the application was given to them respectively; and
 - (iii) the date of service of each such notice.
- (c) a certificate stating—
- (i) that the applicant is unable to issue a certificate in accordance with either paragraph (a) or (b) above;
 - (ii) that he has given the requisite notice of the application to the persons mentioned in paragraph (b) above as are specified in the certificate (setting out their names, the addresses at which notice of the application was given to them respectively, the date of the service of each such notice); and
 - (iii) that he has taken such steps as are reasonably open to him (specifying them) to ascertain the names and addresses of the remainder of those persons and that he has been unable to do so;
- (d) a certificate stating—
- (i) that the applicant is unable to issue a certificate in accordance with paragraph (a) above;
 - (ii) that he has taken such steps as are reasonably open to him (specifying them) to ascertain the names and addresses, of the persons mentioned in paragraph (b) above; and
 - (iii) that he has been unable to do so.

(2) Any such certificate as is mentioned in subsection (1)(c) or (d) above shall also contain a statement that the requisite notice of the application, as set out in the certificate, has on a date specified in the certificate (being a date not earlier than the beginning of the period mentioned in subsection 1(b) above) been published by or on behalf of the applicant in the Gazette and in a newspaper published in Gibraltar.

(3) Where an application for planning permission is accompanied by such a certificate as is mentioned in subsection 1(b), (c) or (d) above, the Commission shall not determine the application before the end of the period of 21 days beginning with the date appearing from the certificate to be the latest of the dates of service of notices as mentioned in the certificate, or the date of publication of a notice as therein mentioned, whichever is the later.

(4) If any person issues any certificate which purports to comply with the requirements of this section and which contains a statement which he knows to be false or misleading in a material particular, or recklessly issues a certificate which purports to comply with those requirements and which contains a statement which is false or misleading in a material particular, he shall be guilty of an offence and liable on summary conviction to a fine at level 4 on the standard scale.

(5) Any certificate issued for the purposes of this section shall be in such form as may be prescribed by regulations.

(6) Any reference in this section to the requisite notice, where a form of notice is prescribed by regulations for the purpose of that provision, is a reference to a notice in that form.

(7) In this section “owner” in relation to any land, means a person who is for the time being the owner in respect of the fee simple thereof or is entitled to a tenancy thereof.

Grant and refusal of permits.

22.(1) Subject to the provisions of sections 19 and 20, the Commission, in dealing with an application for planning permission shall be guided by the provisions of the approved planning scheme then current and by any other material considerations.

(2) The Commission may, in its discretion, grant or refuse a permit applied for under this Act, or may grant a permit subject to such conditions as the Commission may specify in respect of any of the following matters—

- (a) the area and extent of any curtilage, including size, shape, width or depth;
- (b) the siting and arrangement of buildings;
- (c) the proportion of any specified area which may be covered by buildings, the proportion of any specified area within a built environment that must remain an open space, the extent of open spaces at the front, sides and rear of the buildings, and the extent of internal courtyards;

1999-39

Town Planning

- (d) the size, character, height, spacing and frontage lines of buildings;
- (e) objects which may be affixed to buildings, and projections which may be permitted in front of building lines or setbacks;
- (f) the splaying or setting-back or rounding-off of any angle of buildings in the interests of safety or amenity;
- (g) the provision of arcades for public use as pedestrian ways behind general building lines;
- (h) the purposes for and the manner in which buildings may be occupied;
- (i) the provision of car parking spaces or garages or both;
- (j) the period of validity of the permit;
- (k) the protection and enhancement of such structures or details of architectural or heritage worth, as the Commission considers appropriate;
- (kk) the prevention of major accidents and limiting the consequences of such accidents.
- (l) such other matters as the Commission may think fit.

Provided that no such condition shall be inconsistent with the provisions of any regulations made under section 44.

(2A) In acting under this section, the Commission shall, in addition to the matters specified in subsection (2), have regard to the need—

- (a) in the long term, to maintain appropriate distances between establishments and residential areas, buildings and areas of public use, major transport routes as far as possible, recreational areas and areas of particular sensitivity or interest; and
- (b) in the case of existing establishments, for additional technical measures in accordance with Article 5 of the Directive so as not to increase the risks to people.

(2B) In subsection (2A), “establishment” means the whole area under the control of the same person where dangerous substances are present in one or more installations, and for this purpose two or more areas under the control

of the same person and separated only by a road shall be treated as one whole area.

(3) In determining any application for planning permission for development of a class to which section 19 applies, the Commission shall take into account any written representations for or against the grant of a permit relating to that application which are received by them before the end of the period of 21 days beginning with the date of the application or advertisement whichever is the later.

(4) The Commission shall not take into account any representations received after the end of the period mentioned in subsection (3) above unless the delay in receiving the same is shown not to have been the result of any neglect on the part of the person making the representations or of those acting on his behalf.

(5) Where an application for planning permission is accompanied by such a certificate as is mentioned in section 21(1)(b), (c) or (d) the Commission—

- (a) in determining the application, shall take into account any representations relating thereto which are made to them, before the end of the period mentioned in section 21(3), by any person who satisfies them that he is an owner of any land to which the application relates; and
- (b) shall give notice of their decision to every person who has made representations which they were required to take into account in accordance with paragraph (a) above.

(6) The Commission shall not take into account any representations received by them which are not accompanied by a certificate by the person making the representations that he has furnished the applicant with a copy of the representations made and the date that these have been so furnished.

(7) The applicant may, within a period of 14 days from the date of notification under subsection (6) above, submit representations and evidence to the Commission to show why the representations should not be taken into account. The Commission shall not determine the application until the expiry of the said period or receipt of either representations from the applicant or confirmation that none will be made.

(8) The Commission shall, if it refuses to grant a permit applied for under this Act, cause a notice of such refusal to be served on the applicant in the prescribed manner.

(9) Without prejudice to the provisions of section 16, any person to whom a permit has been granted under this Act and who contravenes, or

Town Planning

causes or permits any other person to contravene, any condition imposed under subsection (1) above shall be guilty of an offence.

(10) Where a permit for the change of use of a building has been granted and the use is one which, if the permit were for a building which would require compliance with any other legislation, then in addition to compliance with any conditions imposed by the Commission, the applicant shall comply with such legislation.

(11) Subject to the provisions of this section every permit (other than outline planning permission) shall be valid only for such period from the date of its granting as the Commission shall specify at the time of granting the same and shall become void and of no effect if the development to which the same relates shall not have been commenced within such period.

(12) If the Commission shall not have specified any period under subsection (11) above, the permit shall become void and of no effect at the expiration of three years from the date of granting the same provided however that the Commission may, on application up to 28 days from expiry, extend such period (whether specified by the Commission or imposed by subsection (11) above) from time to time.

(13) For the purpose of this Part, development shall be taken to have commenced on the earliest date on which material operation comprised in the development commences to be carried out.

(14) In this section, “material operation” means—

- (a) any work of construction in the course of the erection of a building;
- (b) the digging of a trench which is to contain the foundations, or part of the foundations, of a building;
- (c) the laying of any underground main or pipe to the foundations, or part of the foundations, of a building or to any such trench as is mentioned in paragraph (b) above;
- (d) any operation in the course of laying out or constructing a road or part of a road;
- (e) any demolition works unless such demolition has been authorised under the provisions of any other enactment;
- (f) any material change in the use of any land.

(15) In this section and in section 24 the expression “permit” includes permission under section 18.

Large Combustion Plants.

22A. The Commission shall not grant permission under section 22 in respect of development involving the use of premises for the operation of a combustion plant unless satisfied that the structure in which it is contained is designed to prevent the discharge of sulphur dioxide, oxides of nitrogen and dust into the air exceeding the limits set out in the Large Combustion Plants Act 2003.

Notification of dangerous substances.

22B.(1) Within a reasonable period of time prior to the start of construction of an establishment, the operator of the establishment shall send to the Minister or the Commission a notification containing the information specified in Schedule 8 of the Public Health Act.

(2) The operator shall notify forthwith the Minister or the Commission in the event of—

- (a) there being any significant increase in the quantity of dangerous substances notified under this section; and
- (b) there being any significant change in—
 - (i) the nature or physical form of the dangerous substances so notified;
 - (ii) the process of employing them; or
 - (iii) any other information notified to the Minister or the Commission under this section in respect of the establishment.

Directions etc. as to method of dealing with applications.

23. Subject to the provisions of section 22, the Minister may make regulations specifying the manner in which applications for planning permission to develop land are to be dealt with by the Commission and in particular—

- (a) enabling him to give directions restricting the grant of a permit by the Commission, either indefinitely or during such period as may be specified in the directions, in respect of any such

development, or in respect of development of any such class, as may be so specified;

- (b) authorising the Commission in such cases and subject to such conditions as may be prescribed by the regulations or by directions given thereunder, to grant a permit for a development which does not accord with the provisions of the approved planning scheme then current;
- (c) requiring the Commission before granting or refusing a permit for any development, to consult with such authorities or persons as may be prescribed by the regulations or by directions given thereunder;
- (d) requiring the Commission to give to any applicant for planning permission, within such time as may be prescribed by regulations such notice as may be so prescribed as to the manner in which his application has been dealt with;
- (e) requiring the Commission to give to him and to such other persons as may be prescribed by or under regulations such information as may be so prescribed with respect to applications for planning permission made to the Commission including information as to the manner in which any such application has been dealt with;
- (f) enabling him to direct—
 - (i) that a particular proposed development is a development to which the requirements of Council Directive 85/337/EEC do or do not apply in whole or in part;
 - (ii) that a particular proposed development or development of a given class is or is not a development in respect of which the consideration of environmental information is required before a permit can be granted;
- (g) for prescribing particular requirements and procedures for applications relating to different types of development.

Appeal against decision of Commission.

24.(1) For the purposes of this section “appellant” means an applicant for a permit who has appealed to the Tribunal under subsection (5) below.

(2) The Chief Minister shall appoint a Development Appeals Tribunal to hear and determine appeals under this Act.

(3) The provisions contained in Schedule 2 shall have effect with respect to the constitution and proceedings of the Tribunal.

(4) No member of the Commission shall sit as a member of the Tribunal on an appeal to that body from a decision of the Commission to which he was a party.

(5) Any applicant for a permit under this Act who is aggrieved by the refusal of the Commission to grant the permit, or by the insertion of any condition in the permit, may within 28 days of his being notified in writing of the refusal or of the issue of the permit containing the condition, as the case may be, appeal, by notice in writing under this section, to the Tribunal.

(6) A notice of appeal under subsection (5) above shall be served on the secretary of the Commission within 28 days of the date of notification of the decision to which it relates and shall contain the grounds of the appeal and the secretary shall forthwith send a copy of the notice to the Tribunal.

(7) The Tribunal shall not consider an appeal under this section unless the appellant produces evidence to the satisfaction of the Tribunal that he has served a copy of the notice of appeal to any person who made representations under section 22(3) on the application to which the appeal relates.

(8) On an appeal the Tribunal may—

- (a) confirm or vary the decision of the Commission in whole or in part;
- (b) where a permit has been refused by the Commission, direct that a permit shall be granted subject to such conditions, if any, as the Tribunal may specify; or
- (c) direct that any condition inserted in a permit by the Commission shall be deleted or modified or be replaced by such conditions as the Tribunal may specify.

(9) Before determining an appeal the Tribunal shall, if either the appellant or the Commission so desire, afford to each of them an opportunity of appearing before, and being heard by, the Tribunal.

(10) An appellant and the Commission may be represented on the hearing of an appeal by counsel or a solicitor or by any other person of their choice having relevant expertise.

(11) Subject to subsection (4) above, sections 21 and 22 (3) shall apply, with any necessary modifications, in relation to an appeal to the Tribunal as they apply in relation to an application for planning permission which falls to be determined by the Commission.

(12) The decision of the Tribunal on any appeal shall be final, and it shall be the duty of the Commission and the appellant to comply with any directions of the Tribunal given in respect of any such appeal.

Appeal in default of planning decision.

25.(1) This section applies where an application is made to the Commission for planning permission, or for any approval of the Commission required under this Part.

(2) Unless within such period as may be prescribed by regulations or within such extended period as may at any time be agreed upon in writing between the applicant and the Commission, the Commission gives notice to the applicant of their decision on the application, the provisions of section 24 shall apply in relation to the application as if the permit or approval to which it relates had been refused by the Commission and as if notification of their decision had been received by the applicant at the end of the period prescribed by the regulations or at the end of the said extended period, as the case may be.

Permission to retain buildings or works or continue use of land.

26.(1) An application for planning permission may relate to buildings or works constructed or carried out, or a use of land instituted, before the date of the application, where—

- (a) the buildings or works were constructed or carried out, or the use instituted, without a permit or in accordance with a permit granted for a limited period; or
- (b) the application is for permission to retain the buildings or works, or continue the use of the land, without complying with some condition subject to which a previous permit was granted.

(2) Any power to grant a permit to develop land shall include power to grant a permit for the retention of land or buildings or works constructed or carried out, or for the continuance of a use of land instituted, as mentioned in subsection (1) above.

(3) References in this Act to a permit to develop land or to carry out any development of land, and to applications for planning permission shall be construed accordingly.

(4) Subsection (2) above shall not affect the construction of section 19, 22 (2) or 22(4).

(5) Any permit granted in accordance with subsection (2) above may be granted so as to take effect from the date on which the buildings or works were constructed or carried out, or the use was instituted, or in the case of buildings or works constructed or a use instituted in accordance with a permit granted for a limited period so as to take effect from the end of that period, as the case may be.

Enforcement Orders.

27.(1) Without prejudice to the powers of the Commission pursuant to section 26, if any person has been convicted under section 16 of carrying out a development in contravention of any of the provisions of that section, it shall be lawful for the Commission, by order in writing served on that person in the prescribed manner, to direct him within such time as may be specified in the order—

- (a) to demolish any building so erected; or
- (b) to desist from and cease any development; or
- (c) to resume any such use of the building or land as would be lawful without a permit.

(2) If any person fails to comply with an order under subsection (1) above he shall be guilty of an offence.

Power of Commission to demolish building.

28.(1) Without prejudice to the powers of the Commission pursuant to section 26, if any person has been convicted under section 27 of failing to comply with an order to demolish a building or part thereof, it shall be lawful for the Commission to cause the building or part thereof, to be demolished.

(2) Any persons authorised by the Commission to carry out the demolition, together with their workmen, may enter the land on which such building is situated and do all such acts as may be necessary for the purpose of such demolition.

(3) Any person who hinders or obstructs any person so authorised or any of his workmen in doing any act necessary for the purpose of such demolition shall be guilty of an offence.

(4) Any expenses incurred in the demolishing by the Commission of any building or part thereof under this section shall be recoverable by suit brought in the name of the Attorney-General from the person who failed to comply with the order issued in respect thereof.

Inspection of premises.

29.(1) A building inspector authorised in writing by the Minister or the Commission may enter any land or premises where any development is being carried out or where the Commission has reason to believe that any building operation or any development has been carried out after the appointed day.

(2) A building Inspector may inspect the land or premises for the purpose of ascertaining whether the provisions of this Act or of any regulations, or any condition subject to which a permit has been granted, thereunder are being or have been complied with.

(3) A person who hinders or obstructs a building Inspector in the exercise of the powers conferred on him by this section shall be guilty of an offence.

Provisions as to effect of permit.

30.(1) Without prejudice to the provisions of this Part as to the duration or modification a permit, any grant a permit to develop land shall (except in so far as the permit otherwise provides) endure for the benefit of the land and of all persons for the time being interested therein.

(2) Where a permit is granted for the erection of a building, the grant of the permit may specify the purposes for which the building may be used and if no purpose is so specified, the permit shall be construed as including permission to use the building for the purpose for which it is designed.

Registers of applications and decisions.

31.(1) The Commission shall keep, in such manner as may be prescribed by regulations, a register containing such information as may be so prescribed with respect to applications for planning permission made to the Commission including information as to the manner in which such applications have been dealt with.

(2) Regulations may make provisions for the register to be kept in two or more parts, each part containing such information relating to applications for

planning permission, made to the Commission as may be prescribed, and may also make provision—

- (a) for a specified part of the register to contain copies of applications and of any plans or drawings submitted therewith; and
- (b) for the entry relating to any application, and every thing relating thereto, to be removed from that part of the register when the application (including any appeal arising out of it) has been finally disposed of, without prejudice to the inclusion of any different entry relating thereto in another part of the register.

(3) Every register shall be available for inspection by the public during working hours.

Termination of permit by reference to time limit: completion notices.

32.(1) Where a development has been commenced within the period limited pursuant to section 22(11) but that period has elapsed without the development having been completed then, if the Commission is satisfied that the development will not be completed within a reasonable period, they may serve a completion notice stating that the permit will cease to have effect at the expiration of a further period specified in the notice.

(2) The period so specified must not be less than 6 months after the notice takes effect.

(3) A completion notice shall be served upon—

- (a) the owner of the land;
- (b) the person who applied for planning permission;
- (c) the occupier of the land; and
- (d) any other person who in the opinion of the Commission will be affected by the notice.

(4) The Commission may withdraw a completion notice at any time before the expiration of the period mentioned in it as the period at the expiration of which the permit is to cease to have effect and if they do so shall immediately give notice of the withdrawal to every person who was served with the completion notice.

Effect of completion notice.

1999-39

Town Planning

33.(1) If within such period as may be specified in the completion notice (which must be not less than 28 days from its service) any person on whom the notice is served so requires, the Commission shall refer the matter to the Tribunal for determination, and a completion notice shall not take effect unless and until confirmed by the Tribunal.

(2) In confirming a completion notice the Tribunal may substitute some longer period for that specified in the notice as the period or the expiration of which the permit is to cease to have effect.

(3) If a completion notice takes effect, the permit referred to in it shall become invalid on the expiration of the period specified in the notice (whether the original period specified under section 32(2) or a longer period substituted by the Tribunal under subsection (2) above).

(4) Subsection (3) above shall not affect any permit, so far as development carried out under it before the end of the period mentioned in that subsection is concerned.

Power to modify permit.

34.(1) If it appears to the Commission expedient to modify any permit for a development granted on an application made under this Part, the Commission may, by order, modify the permit to such extent as they consider expedient.

(2) In exercising its function under subsection (1) above the Commission shall be guided by the current planning scheme and to any other material considerations.

(3) The power conferred by this section may be exercised—

- (a) where the permit relates to the carrying out of building or other operations, at any time before those operations have been completed;
- (b) where the permit relates to a change of the use of any land, at any time before the change has taken place.

(4) The modification of a permit for the carrying out of building or other operations shall not affect so much of those operations as has been previously carried out.

Procedure on modification orders where objections received.

35.(1) Save as provided in section 36, if, within such period as may be specified in a modification order issued under section 34 (which must be not

less than 28 days from its service) any person on whom the notice is served so requires, the Commission shall refer the matter to the Tribunal for determination, and a modification order shall not take effect unless and until confirmed by the Tribunal.

(2) Where a modification order is referred to the Tribunal for determination, the Commission shall notify the following persons of that fact, that is to say—

- (a) the owner of the land affected;
- (b) the person who applied for planning permission;
- (c) the occupier of the land affected; and
- (d) any other person who in their opinion will be affected by the order.

(3) The notice under subsection (2) above shall specify the right of any person upon whom it is served to appear before, and be heard by, the Tribunal.

(4) If the Tribunal confirms the issue of a modification order, the Commission shall advertise the fact in the Gazette and in a newspaper published in Gibraltar.

Procedure on modification orders where no objections received.

36.(1) When the Commission has issued a modification order under section 34 and no person on whom the notice was served has required the matter to be referred to the Tribunal for determination, the Commission shall advertise in the Gazette and one newspaper published in Gibraltar the fact that the order has been made, and the advertisement must specify—

- (a) the period (not being less than 28 days from the date the advertisement first appears) within which persons affected by the order, not being persons on whom the notice was served, may give notice to the Commission that they desire an opportunity of appearing before, and being heard by, the Tribunal; and
- (b) the period (not being less than 14 days from the expiration of the period referred to in paragraph (a) above) at the expiration of which, if no such notice is given to the Commission, the order may take effect by virtue of this section.

(2) The Commission shall send a copy of any advertisement published under subsection (1) above to the Minister not more than 3 days after the publication.

(3) Where notice has been received by the Commission pursuant to subsection (1)(a) above, the Commission shall refer the matter to the Tribunal for determination, and a modification order issued under section 34 shall not take effect unless and until confirmed by the Tribunal.

PART V

Preservation of Amenities

Notices for preservation of amenities.

37.(1) If it appears to the Commission that the amenity of any area is prejudiced or impaired by the condition of any land, building, garden, vacant site or other premises, the Commission may serve on the owner and occupier thereof a notice requiring such steps to be taken for preserving the amenity as may be specified in such notice, within such time as may be specified in the notice; and without prejudice to the generality of such powers, any such notice may require the owner or occupier of such premises at his own expense—

- (a) to paint, distemper, whitewash or colourwash to a colour approved by the Commission the outside walls or roof of any building which is part of the premises and which in the opinion of the Commission is unsightly and in need of painting, distempering, white-washing or colourwashing;
- (b) to remove any temporary or unauthorised structure which in the opinion of the Commission is a disfigurement to the neighbourhood;
- (c) to screen or tidy the premises and their curtilage when in the opinion of the Commission they are in such an untidy condition as to be offensive to the eye;
- (d) to remove derelict motor or other vehicles or other unsightly debris (whether similar to the foregoing or not) from the premises;
- (e) to repair or replace any fixture or fitting attached to the facade of a building, including, but without prejudice to the generality of the foregoing, broken or damaged shutters, external woodwork, guttering and piping and broken or cracked windows, and all defective external finishes or building fabric.

(2) If the person on whom a notice has been served under subsection (1) above fails within the time specified in the notice to carry out the requirements of the notice the Commission may cause a complaint to be made before the magistrates' court and the court shall thereupon issue a summons requiring the person on whom the notice was served to appear before it.

(3) If the court is satisfied that any or all of the requirements of the notice are reasonable and that it is reasonable for the person on whom the notice was served to carry out such requirements, the court shall make an order directing such person to carry out the requirements of the notice or such of them as the court considers reasonable within a specified time.

(4) A person who fails to obey an order made under subsection (3) above unless he satisfies the court that he has used all diligence to carry out such order, shall be guilty of an offence and is liable on summary conviction to a fine at level 1 on the standard scale and in the case of a continuing offence to a further fine at one tenth of level 1 on the standard scale for every day after the first day during which such failure occurs.

38. *Repealed*

Control of advertisements.

39.(1) The Minister may make regulations providing for restricting or regulating the display of advertisements so far as appears to the Commission to be expedient in the interests of amenity or public safety, and without restricting the generality of the foregoing, any such regulations may provide-

- (a) for regulating the dimensions, appearance, material and manner of construction, and position of advertisements that may be displayed, the sites on which such advertisements may be displayed, the materials to be used in the construction and display of the advertisement, and the manner in which they are to be affixed to land;
- (b) for requiring the consent of the Commission to be obtained for the display of advertisements, or of advertisements of any class specified in the regulations;
- (c) for enabling the Commission to require the removal of any advertisement that is being displayed in contravention of the regulations, or the discontinuance of the use for the display of advertisements of any site that is being used for that purpose in contravention of the regulations.

1999-39

Town Planning

(2) Regulations made under this section may be made so as to apply to advertisements that are being displayed on the date on which the regulations come into force, or to the use for the display of advertisements on any site that was being used for that purpose on that date, and may provide for exempting therefrom—

- (a) the continued display of any such advertisement; and
- (b) the continued use for the display of advertisements on any such site,

during such period as may be prescribed in that behalf by the regulations, and different periods may be so prescribed for the purposes of different provisions of the regulations.

Stoppage orders.

40.(1) Where it appears to the Commission that work is proceeding on any land in contravention of section 16, or not in accordance with terms of a permit granted by the Commission, the Commission may issue a stoppage order for the work to cease forthwith.

(2) A person who fails to comply with a stoppage order shall be guilty of an offence and shall be liable on summary conviction to a fine at level 2 on the standard scale and to a continuing fine at one tenth of level 2 on the standard scale a day for every day that work continues in contravention of the order.

Appeal against stoppage order.

41.(1) Any person who is aggrieved by a stoppage order may within 28 days from the date of the issue of the stoppage order appeal to the Tribunal against its issue.

- (2) On hearing the appeal—
 - (a) where the Tribunal is satisfied that the work to which the stoppage order relates was in contravention of section 16 or was not in accordance with the terms of a permit granted by the Commission, it shall dismiss the appeal; and
 - (b) where the Tribunal is not so satisfied, it shall allow the appeal and set aside the stoppage order.

(3) Pending the determination of the appeal, the stoppage order shall remain in full force and effect.

(4) Notwithstanding subsection (3) above, the Tribunal may if it thinks fit, on the application of the appellant, suspend the stoppage order pending the determination of the appeal.

PART VI

Miscellaneous

Signature and authentication of documents.

42.(1) Every permit, notice, order or other document authorised or required by this Act to be issued by the Commission or by the Tribunal shall be signed by the chairman of the relevant body or by his delegate appointed in writing for the purpose and a copy of such permit, notice order or document purporting to be certified under the hand of the chairman or of such delegate to be a true copy shall be admissible in any proceedings without further proof thereof as prima facie evidence of the issue of such permit, notice order or document and of the contents thereof.

(2) The appointment from time to time of a delegate pursuant hereto to subsection (1) above and his removal shall be notified in the Gazette prior to or not later than 14 days after such appointment or removal is effected.

Penalty.

43. A person who commits an offence under this Act or any regulations made thereunder for which no penalty is provided shall be liable on summary conviction to imprisonment for three months and a fine fixed at twice the level 3 on the standard scale, and in the case of a continuing offence to a daily fine fixed at level 1 on the standard scale.

Regulations.

44.(1) The Minister may make regulations—

- (a) for the purpose of facilitating the work of the Commission;
- (b) exempting from the application of this Act any class or description of development subject to such conditions, if any, as may be specified in the regulations;
- (c) providing, either generally or in relation to any class or description of development for any of the matters specified in section 17(1);
- (d) prescribing any matter authorised or required by this Act to be prescribed;

- (e) for regulating appeals under section 24, 25 or 41;
- (f) defining the grounds on which third parties may object to applications for planning permission;
- (g) prescribing the information which must be supplied by an applicant for planning permission and such regulations may impose different requirements for different types of development;
- (h) generally for carrying out any of the purposes or provisions of this Act or any matters incidental or consequential thereto as may appear to the Minister to be necessary or proper for giving full effect to this Act and to the obligations of the Government under Community law.

(2) Regulations made under subsection (1) above shall be laid on the table of the Parliament at the meeting commencing next after they have been made.

(3) Where the Commission is authorised under any subsidiary legislation to dispense with or relax the requirements of such legislation it shall be lawful for the Commission so to do on such terms and conditions as it deems proper.

Amendment of Schedules.

45.(1) The Minister may by order published in the Gazette amend or vary the Schedules.

(2) Every order made under this section shall be laid before the Assembly at the meeting thereof next ensuing after such order has been made.

Saving.

46. The provisions of this Act shall be in addition to and not in derogation of the provisions of the Public Health Act and any other law for the time being in force relating to buildings or building operations.

Transitional Provisions.

47.(1) In this section the “old Act” means the Town Planning Act repealed by section 48.

(2) The substitution of this Act for the old Act shall not affect the continuity of the law.

(3) The repeal of the old Act shall not affect-

- (a) any outline planning permission granted under section 17A of the old Act; or
- (b) any permit granted under section 18 of the old Act;

to which those sections applied immediately before the commencement of this Act and accordingly such permission and permit have effect and shall be deemed always to have had effect as provided in those sections.

(4) The repeal of the old Act shall not affect an appeal-

- (a) against the decision of the Commission under section 19 of the old Act; or
- (b) against a stoppage order under section 27 of the old Act;

which is pending determination at the commencement of this Act. The determination of such an appeal shall be effected as provided in the old Act.

(5) If a person who at the commencement of this Act held outline planning permission granted under section 17A of the old Act and not expired by the effluxion of the time period in subsection 18(5) of the old Act, applies for a permit in accordance with the provisions of this Act, the Commission may, in its discretion, direct that the provisions of sections 19 to 21 shall not apply to such an application.

(6) An application for a permit made under section 17 of the old Act which at the commencement of this Act was pending a decision by the Commission shall be governed by the provisions of this Act except that the Commission may, in its discretion, direct that the provisions of sections 19 to 21 shall not apply to such an application.

(7) An appeal lodged after the commencement of this Act in relation to a permit refused under the old Act, shall be governed by the provisions of this Act.

Repeal.

48. The Town Planning Act is repealed.

SCHEDULE 1

Section 3(2)

DEVELOPMENT AND PLANNING COMMISSION**Membership of Commission.**

1.(1) The Commission shall consist of the following voting members—

- (a) the Town Planner, who shall be the chairman;
- (b) the Minister;
- (c) five persons nominated by the Chief Minister;
- (d) one person nominated by the Ministry of Defence;
- (e) one person nominated by the Gibraltar Heritage Trust;
- (f) one person nominated by the Gibraltar Ornithological and Natural History Society; and
- (g) one person nominated by the Environmental Safety Group

(2) Alternate members may, from time to time, be appointed to substitute for any of the members of the Commission and they shall have the same rights and powers as appointed members.

(3) Where an appointment is made under subparagraphs (1) and (2) above, or any person ceases to hold any such appointment, notice of the fact shall be published in the Gazette.

(4) An appointed member or alternate member, unless he dies, resigns, or is removed from office under subparagraph (6) below, shall hold office for a term of three years from the date of his appointment and thereafter until his successor comes into office.

(5) An appointed or an alternate member may be re-appointed.

(6) The Chief Minister may remove from office on the grounds of inability, neglect of duty, insolvency or misconduct any appointed or alternate member of the Commission.

Chairman and Procedure.

2.(1) The Town Planner as chairman of the Commission shall preside at all meetings of the Commission.

(2) At any meeting of the Commission four voting members shall form a quorum.

(3) Subject to the provisions of this Act, the Commission may regulate its own procedure.

(4) When, in the opinion of the chairman, the business before the Commission makes it desirable to do so, an invitation may be issued to any person to a meeting of the Commission or to such part of a meeting as is concerned with such business notwithstanding that such person is not a member of the Commission.

(5) Any person so invited shall be entitled to take part as if he were a member in the proceedings of the Commission relating to the matter in respect of which he was invited except that he shall not have a right to vote.

(6) The decision of the majority of the members present and voting at any meeting shall be the decision of the Commission on any matter before it, and on an equality of votes the Chairman shall have an additional casting vote.

Committees.

3.(1) The Commission may appoint committees (which need not include members of the Commission) and delegate to any such committee, any function conferred on the Commission.

(2) Subject to any directions of the Commission, a committee appointed under this paragraph may regulate its own procedure and fix a quorum for its meetings.

(3) Paragraph 2(4) shall apply to a committee as it applies to the Commission *mutatis mutandis*.

Executive Officer.

4. The Deputy Town Planner or such other person as the Minister may from time to time appoint shall be the Executive Officer of the Commission.

SCHEDULE 2

Section 24

DEVELOPMENT APPEALS TRIBUNAL

Members of the Tribunal.

1.(1) The Tribunal shall consist of five persons appointed by the Chief Minister, one of whom shall be a barrister or solicitor admitted to practice in Gibraltar*.

(2) A member of the Tribunal shall hold office for a period of one year or for such other period of time as may be specified in the notice of appointment.

(3) A member of the Tribunal shall not continue in office after he attains the age of seventy years.

(4) The validity of any proceedings of the Tribunal shall not be affected by a defect in the appointment of any of its members, or by a failure to observe the requirements of subparagraph (4) above.

(5) The Accountant General shall pay members of the Tribunal, who are not public officers, by way of reimbursement of expenses such amounts as he may determine appropriate.

Secretary to the Tribunal.

2.(1) A secretary to the Tribunal shall be appointed by the Minister by notice in the Gazette and shall hold office for a period of one year or for such other period of time as may be specified in the notice of appointment*.

(2) A person appointed secretary to the Tribunal shall act under the direction of members of the Tribunal.

(3) The Accountant General shall pay the secretary, if not a public officer, such remuneration in respect of his services as he may determine appropriate.

(4) The members of the Tribunal may, with the consent of the Minister, dismiss the secretary.

* LN 2004/009 Establishes the composition of the Development Appeals Tribunal. *See document* [2003/040]

* LN [2003/040] Nominates the Secretary.

(5) A secretary shall not continue in office after he has attained the age of seventy years unless the Minister thinks it desirable in the public interest to extend his term of office; but the term shall not be extended beyond the age of seventy five years.

Duties of members of the Tribunal.

3.(1) No member of the Tribunal shall act as such in relation to any matter in which he has a personal interest.

(2) No member of the Tribunal shall disclose any information received in the course of his duties except in such cases as may be required by law.

(3) A member of the Tribunal responsible for any act or omission contrary to the provisions of subparagraph (2) above shall be guilty of an offence and liable on summary conviction to a fine not exceeding level 5 on the standard scale.

Quorum.

4. Three members of the Tribunal shall form a quorum.

Procedure.

5.(1) The members comprising a Tribunal shall decide which one of them shall preside at the hearing of proceedings before them.

(2) Proceedings before any Tribunal may be continued by any one or more of the members of the Tribunal if all parties give their consent.

(3) Unless the Tribunal otherwise fixes a date for a hearing, any party to proceedings which are to be heard by the Tribunal shall serve notice on the secretary that he wishes a date for the hearing to be fixed.

(4) On receipt of a notice under subparagraph (3) above the secretary shall send notice to each party to the proceedings of the place, date and time of the hearing.

(5) Unless the parties otherwise agree or the Tribunal otherwise directs, the date of the hearing specified in a notice under subparagraph (4) above shall not be earlier than 28 days after the date on which the notice is sent to the parties.

(6) If it is shown to the satisfaction of the Tribunal that owing to any reasonable cause a person has been prevented from attending the hearing of an appeal on the day fixed for that purpose, the Tribunal may adjourn the hearing of his appeal for such reasonable time as it thinks necessary, or admit the appeal to be made by any agent, clerk or servant on his behalf.

Hearings.

6.(1) Hearings before the Tribunal shall be conducted in such manner as the members of the Tribunal consider most suitable for the clarification and determination of the issues before the Tribunal and generally to the just handling of the proceedings.

(2) Evidence before the Tribunal may be given orally or, if the Tribunal so directs, by affidavit or a statement made or recorded in a document, but at any stage of the hearing, the Tribunal may, on the application of any party or of its own motion, require the personal attendance as a witness of-

- (a) the maker of an affidavit; or
- (b) the maker of a statement; or
- (c) in the case of an oral statement recorded in a document, the person by whom the statement was so recorded:

Provided that the Tribunal may require any witness to give evidence on oath or affirmation and for that purpose there may be administered an oath or affirmation in due form.

Tribunal decisions.

7.(1) A decision of the Tribunal shall be made by the votes of the majority of the members comprising that Tribunal and in the event of an equality of votes the member presiding at the hearing shall be entitled to a second or casting vote.

(2) The decision may be given orally by the presiding member of the Tribunal at the end of the hearing or may be reserved and in either event shall be recorded in a document signed and dated by the presiding member of the Tribunal.

(3) The secretary shall send to each party a notice setting out the decision recorded under subparagraph (2) above.

(4) Except where the decision is given at the end of a hearing, it shall be treated as having been made on the date when the notice is sent to the parties under subparagraph (3) above.

Power to request further particulars.

8. The Tribunal may, at any time before the determination of an appeal, give notice to the appellant or any other party to the proceedings requiring

him within a time specified in the notice to deliver to it such particulars as it may require for the purposes of determining the appeal.

Power to summon witnesses.

9. The Tribunal may summon any person to appear before it and give evidence.

Irregularity.

10. Any irregularity resulting from any failure to comply with any provision of this Schedule or with any direction given by the Tribunal before the Tribunal has reached its final determination shall not of itself render the proceedings void.

Form of notices.

11. Every notice required by this Schedule shall be in writing unless the members of the Tribunal authorise it to be given orally.

Service of notices etc..

12. Any notice or document required or authorised by this Schedule to be sent, delivered to or served on any person shall be duly sent, delivered or served by hand, by post or by facsimile transmission.

Town Planning (Environmental Impact Assessment) Regulations 2000

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**
**Subsidiary
2000/013**

Regulations made under sections 23 and 44 of the Town Planning Act.

**TOWN PLANNING (ENVIRONMENTAL IMPACT
ASSESSMENT) REGULATIONS, 2000**
(LN. 2000/013)
24.5.2001

Amending enactments	Relevant current provisions	Commencement date
2003/129	r. 2(1)(c), 2 and 8(4).	18.12.2003
2006/158	rr.2(1), 4(8), (9) & (10), 6(1) & (4), 9(1)(b), (c) & (d), 10(1A), 11(1), (2), (3), (4) & (5), 12(e), 13(1) & (2), 16(4), Sch. 1 & 2	25.1.2007

Note:

Screening Direction under regulation 4(5) published at the end of these Regulations.

EU Legislation/International Agreements involved:

Directive 85/337/EEC
 Directive 96/61/EC
 Directive 97/11/EC
 Directive 2003/35/EC

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

**Subsidiary
2000/013**

ARRANGEMENT OF REGULATIONS

**PART I
GENERAL**

1. Title and commencement.
2. Interpretation.
3. Prohibition on granting a permit without consideration of environmental information.

**PART II
PROCEDURES CONCERNING APPLICATION FOR PLANNING
PERMISSION**

Screening of List 2 Developments

4. General provisions relating to screening.
5. Requests for screening opinions.

Procedures concerning applications for planning permission

6. Application made without an environmental statement.

Preparation of environmental statements

7. Requests for scoping opinions.
8. Procedure to facilitate preparation of environmental statements.

Publicity and procedure on submission of environmental statement

9. Procedure where an environmental statement is submitted.
10. Procedure where an environmental statement is submitted after the planning application.
11. Further information and evidence respecting environmental statements.

Availability of directions etc. And notification of decisions

12. Additional particulars on the register.
13. Duties to inform the public of final decisions.

**PART III
DEVELOPMENTS WITH SIGNIFICANT TRANSBOUNDARY
EFFECTS**

1999-39**Town Planning****TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

14. Development in Gibraltar likely to have significant effects in a Member State.
15. Projects in a Member State likely to have significant transboundary effects.

**PART IV
MISCELLANEOUS**

16. Public Development.
17. Amendments to the Town Planning (Applications) Regulations.

SCHEDULES

- | | |
|------------|---|
| Schedule 1 | Descriptions of development for the purposes of the definition of “List 1 development”. |
| Schedule 2 | Descriptions of development for the purposes of the definition of “List 2 development”. |
| Schedule 3 | Selection criteria for screening List 2 development. |
| Schedule 4 | Information for inclusion in environmental statements. |

PART I
*General***Title and commencement.**

1. These Regulations may be cited as the Town Planning (Environmental Impact Assessment) Regulations 2000 and shall come into operation on such day as the Minister may by notice in the Gazette appoint.

Interpretation.

2.(1) In these Regulations—

“any particular person” includes any non-governmental organization promoting environmental protection;

“the Commission” means the Development and Planning Commission established under the Act;

“the consultation bodies” means—

- (a) any body which the Commission may need to consult on an application for planning permission;
- (b) the Environmental Agency; and
- (c) any statutory body which has a specific environmental responsibility;

“the Directive” means Council Directive 85/337/EEC as amended by Council Directive 97/11/EC and Council Directive 2003/35/EC;

“EIA application” means an application for planning permission for an EIA development;

“EIA development” means a development which is either —

- (a) a List 1 development; or
- (b) a List 2 development likely to have significant effects on the environment by virtue of factors such as its nature, size or location;

“environmental information” means—

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

- (a) the environmental statement;
- (b) any other information relating to the environmental statement;
- (c) any further information provided under regulation 11; and
- (d) any representations made by any body or person about the environmental effects of the development;

“environmental statement” means a statement—

- (a) that includes such of the information referred to in Part I of Schedule 4 as is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile, but
- (b) that includes at least the information referred to in Part II of Schedule 4;

“exempted development” means development in respect of which the Minister has made a direction under regulation 4(8);

“the land” means the land, sea or sea-bed on which the development would be carried out or, in relation to development already carried out, has been carried out;

“List 1 application” and “List 2 application” mean an application for planning permission for List 1 development and List 2 development respectively;

“List 1 development” and “List 2 development” mean development, other than exempt development, of a description mentioned in Schedule 1 and Schedule 2 respectively;

“public body” means a department of the Crown, an authority established by statute, or any servant or agent thereof;

“public development” means a proposed List 1 development or List 2 development by a public body;

“register” means the register kept under section 31 of the Act;

“scoping opinion” has the meaning given in regulation 7(1);

TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS, 2000

**Subsidiary
2000/013**

“screening direction” means a direction made by the Minister as to whether or not a List 2 development is EIA development;

“screening opinion” means a written statement of the opinion of the Town Planner as to whether List 2 development is EIA development.

(2) Subjects to sub-regulation (3) below, expressions used both in these Regulations and in the Act have the same meaning for the purposes of these Regulations as they have for the purposes of the Act.

(3) Expressions used both in these Regulations and in the Directive (whether or not also used in the Act) have the same meaning for the purposes of these Regulations as they have for the purposes of the Directive.

Prohibition on granting a permit without consideration of environmental information.

3. Notwithstanding Part IV of the Act, the Commission shall not grant a permit pursuant to an EIA application received by the Commission on or after the date of commencement of these Regulations, unless it has first taken the environmental information into consideration and it shall state in its decision that it has done so.

PART II

PROCEDURES CONCERNING APPLICATIONS FOR PLANNING PERMISSION

Screening of List 2 Developments

General provisions relating to screening.

4.(1) Where the Town Planner has to decide whether a List 2 development is EIA development, he shall take into account in making that decision such of the selection criteria set out in Schedule 3 as are relevant to the development (a “screening opinion”).

(2) The Town Planner may give a screening opinion irrespective of whether he has received a request to do so.

(3) Where the Town Planner gives a screening opinion to the effect that a List 2 development is EIA development that opinion shall be accompanied by a written statement giving clearly and precisely the full reasons for that conclusion.

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

(4) Where the Town Planner gives a screening opinion he shall send a copy of the opinion and the written statement to the Minister with a request that the Minister makes a direction under subregulation (5) below.

(5) A direction of the Minister (a “screening direction”) shall be made within 28 days beginning with the date of receipt of a screening opinion pursuant to sub-regulation (4) above and shall be published in the Gazette as soon as practicable thereafter.*

(6) A screening direction shall determine for the purposes of these Regulations whether or not a List 2 development is EIA development.

(7) The Town Planner shall send a copy of the screening direction to the person who proposes to carry out the development in question informing him that he is required to submit an environmental statement with an application for planning permission.

(8) The Minister may direct that these Regulations shall not apply to a project specified in the direction either—

- (a) in accordance with Article 2(3) of the Directive (but without prejudice to Article 7 of the Directive), or
- (b) if the development comprises or forms part of a project serving national defence purposes and these Regulations would have an adverse effect on those purposes.

(9) Where a direction is given under subregulation (8) the Minister must send a copy of any such direction to the Commission.

(10) Where a direction is given under subregulation (8) the Minister must—

- (a) make available the information considered in making the direction and his reasons for doing so;
- (b) consider whether another form of assessment would be appropriate; and
- (c) take such steps as he considers appropriate to bring the information obtained under the other form of assessment to the attention of the public.

Requests for screening opinions.

* *Screening direction if any published at the end of these Regulations.*

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

5.(1) A person who is minded to carry out development may request a screening opinion from the Town Planner.

- (2) A request for a screening opinion shall be accompanied by—
- (a) a plan sufficient to identify the land;
 - (b) a brief description of the nature and purpose of the development and of its possible effects on the environment; and
 - (c) such other information or representations as the person making the request may wish to provide or make.

(3) The Town Planner on receiving a request for a screening opinion shall, if he considers that he has not been provided with sufficient information to give an opinion, notify in writing the person making the request of the points on which he requires additional information.

(4) The Town Planner shall send a screening opinion to the Minister within 28 days beginning with the date of receipt of a request made pursuant to sub-regulation (1) above or such longer period as may be agreed in writing with the person making the request.

Procedures concerning applications for planning permission

Application without an environmental statement.

6. (1) Where an EIA application for planning permission under sections 17 or 18 of the Act which is before them for determination is not accompanied by an environmental statement, the Commission shall notify the applicant in writing—

- (a) that the submission of an environmental statement is required;
- (b) where appropriate, the details of any particular person who is or is likely to be affected by or has an interest in the application.

(2) The Commission shall notify the applicant in accordance with sub-regulation (1) above within 21 days beginning with the date of receipt of the application or such longer period as may be agreed in writing with the applicant.

(3) An applicant receiving a notification pursuant to sub-regulation (2) above may, within 21 days of the date of receipt of the notification, write to

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

the Commission stating that he accepts its view and is providing an environmental statement.

(4) If the applicant does not write to the Commission in accordance with sub-regulation (3) above or does not submit an environmental statement, the planning permission sought, shall be deemed to be refused at the end of the 21 days period and the deemed refusal –

- (a) shall be treated as a decision of the Commission; but
- (b) shall not give rise to an appeal to the Tribunal under section 24 of the Act.

*Preparation of environmental statements***Requests for scoping opinions.**

7.(1) A person who is minded to make an EIA application may ask the Town Planner to state in writing his opinion as to the information to be provided in the environmental statement (a “scoping opinion”).

- (2) A request for a scoping opinion shall be accompanied by–
 - (a) a plan sufficient to identify the land;
 - (b) a brief description of the nature and purpose of the development and of its possible effects on the environment; and
 - (c) such other information or representations as the person making the request may wish to provide or make.

(3) The Town Planner on receiving a request under subregulation (1) above shall, if he considers that he has not been provided with sufficient information to give a scoping opinion, notify the person making the request of the points on which he requires additional information.

(4) The Town Planning shall not give a scoping opinion in response to a request under sub-regulation (1) above until he has consulted the consultation bodies, but shall, within 28 days beginning with the date of receipt of that request or additional information, if that be the case, or such longer period as may be agreed in writing with the person making the request, give a scoping opinion and send a copy to the person who made the request.

(5) Before giving a scoping opinion the Town Planner shall take into account–

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

- (a) the specific characteristics of the particular development;
- (b) the specific characteristics of development of the type concerned; and
- (c) the environmental features likely to be affected by the development.

(6) The Town Planner on giving a scoping opinion in response to a request under sub-regulation (1) above shall not be precluded from requiring of the person who made the request additional information in connection with any environmental statement that may be submitted by that person in connection with an application for planning permission for the same development as was referred to in the request.

Procedure to facilitate preparation of environmental statement.

8.(1) Any person who intends to submit an environmental statement to the Commission may give notice in writing which shall include the location, nature and purpose of the development and its main environmental consequences.

(2) The Commission on receipt of—

- (a) such a notice as is mentioned in subregulation (1) above; or
- (b) a written statement made pursuant to regulation 6(3) shall—
 - (i) notify the consultation bodies in writing of the name and address of the person who intends to submit an environmental statement and of the duty imposed on the consultation bodies by sub-regulation (3) below to make information available to that person; and
 - (ii) inform in writing the person who intends to submit an environmental statement of the names and addresses of the bodies so notified.

(3) Subject to sub-regulation (4) below; the Commission and any body notified in accordance with sub-regulation (2) above shall, if requested by the person who intends to submit an environmental statement, enter into consultation with that person to determine whether the body has in its possession any information which it or they consider relevant to the preparation of the environmental statement and, if they have, the body shall make that information available to that person.

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

(4) Sub-regulation (3) above shall not require the disclosure of information which is capable of being treated as confidential by reason of any commercial, industrial or intellectual property interest or because its disclosure would be against the public interest or which must be treated as confidential under rule 4 of the Public Health (Freedom of Access to Information on the Environment) Rules 1992.

(5) A reasonable charge reflecting the cost of making the relevant information available may be made by a consultation body which makes information available in accordance with sub-regulation (3) above.

*Publicity and procedures on submission of environmental statement***Procedure where an environmental statement is submitted.**

9.(1) When an applicant making an EIA application submits to the Commission an environmental statement, he shall serve a copy of the statement on the consultation bodies specified by the Commission, and he shall—

- (a) serve with it a copy of the application and any plan submitted with the application (unless he has already served these documents on the body in question);
- (b) inform the body that representations may be made to the Commission;
- (c) inform the Commission of the name of every body whom he has so served and of the date of service; and
- (d) inform any particular person who he considers is likely to be affected by, or has an interest in, the application, by sending him a notice that contains the details set out in subregulation (2)(b) to (f).

(2) The applicant shall publish in the Gazette and in a daily and weekly newspapers published in Gibraltar a notice stating—

- (a) his name and that he is the applicant for planning permission for EIA development;
- (b) the date on which the application was made;
- (c) the address or location and the nature of the proposed development;

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**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

- (d) that a copy of the application and of any plan and other documents submitted with it together with a copy of the environmental statement may be inspected by the public during working hours;
- (e) the address of the secretary of the Commission where those documents may be inspected and the latest date on which they will be available for inspection (being a date not less than 21 days later than the date on which the notice is published);
- (f) that any person wishing to make representations for or against the grant of a permit should make them in writing, before the date named in accordance with paragraph (e) above, to the Commission.

(3) The applicant shall, unless he has not, and was not reasonably able to acquire such rights as would enable him to do so, post on the land a notice containing the information specified in sub-regulation (2) above, except that the date named as the latest date on which the documents will be available for inspection shall be not less than 21 days later than the date on which the notice is first posted.

(4) The notice mentioned in sub-regulation (3) above must comply with the requirements of section 19(5) of the Act.

(5) The environmental statement submitted under subregulation (1) above shall be accompanied by—

- (a) a copies of the notice mentioned in sub-regulation (2) published in the Gazette and in the newspapers; and
- (b) a certificate by or on behalf of the applicant which complies with the requirements of section 19(3)(b) of the Act.

(6) The Commission shall not determine the application before the end of the period of 21 days beginning with the date of receipt of the statement.

Procedure where an environmental statement is submitted after the planning application.

10.(1) Where an application for planning permission has been made without an environmental statement and the applicant proposes to submit such a statement, he shall, before submitting it, comply with sub-regulations (2) to (4) of regulation 8.

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

(1A) Where the applicant has been notified under regulation 6(1)(b), he shall serve a notice on every person of whom he has been so notified; and the notice shall contain the information specified in regulation 9(2)(b) to (f), except that the date named as the latest date on which the documents will be available for inspection shall not be less than 21 days later than the date on which the notice is first served.

(2) Where an applicant indicates that he proposes to provide such a statement and in such circumstances as are mentioned in sub-regulation (1) above, the Commission, shall (unless disposed to refuse the permit sought) suspend consideration of the application until receipt of the statement and the other documents mentioned in sub-regulation 9(5); and shall not determine it during the period of 21 days beginning with the date of receipt of the statement and the other documents so mentioned.

Further information and evidence respecting environmental statements.

11.(1) Where the Commission is dealing with an application for planning permission in relation to which the applicant has submitted an environmental statement, and it is of the opinion that the statement should contain further information, it shall notify the applicant in writing accordingly.

(2) The provider of further information pursuant to sub-regulation (1) shall publish in the Gazette and in a daily and a weekly newspaper published in Gibraltar a notice stating—

- (a) the matters referred to in paragraphs (a) to (c) of regulation 9(2);
- (b) that further information is available in relation to an environmental statement which has already been provided;
- (c) that a copy of the further information may be inspected by members of the public during working hours;
- (d) the address of the secretary of the Commission where the further information may be inspected and the latest date on which it will be available for inspection (being a date not less than 21 days later than the date on which the notice is published);
- (e) that any person wishing to make representations about the further information should make them in writing, before the date specified in accordance with paragraph (d) above, to the Commission.

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(3) The applicant shall send a copy of the further information to each consultation body to whom, in accordance with these Regulations, the statement to which it relates was sent.

(4) Where information is requested under sub-regulation (1) above, the Commission shall suspend determination of the application, and shall not determine it before the expiry of 14 days after the date on which the additional information was sent to all persons to whom the statement to which it relates was sent or the expiry of 21 days after the date that notice of it was published in the Gazette and in the newspapers published in Gibraltar, whichever is the later.

(5) The Commission may in writing require an applicant to produce such evidence as they may reasonably call for to verify any information in his environmental statement.

Availability of directions etc. And notification of decisions

Additional particulars on the register.

12. Where particulars of an application for planning permission are placed on the register, they shall include any relevant—

- (a) screening direction;
- (b) screening opinion;
- (c) scoping opinion;
- (d) notification given under regulation 6(2);
- (e) environmental statement, including any further information provided under regulation 11 or any other information relating to the environmental statement;
- (f) statement of reasons accompanying any of the above;
- (g) the decision and any conditions attached to the permit, if granted;
- (h) the main reasons and considerations on which the decision is based; and

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

- (i) a description, where necessary, of the main measures to avoid, reduce and, if possible, offset the major adverse effects of the development.

Duty to inform the public of final decisions.

13.(1) Where an EIA application is determined by the Commission it shall inform the public, by publishing a notice in the Gazette and by such other means as are reasonable in the circumstances, that the Commission's decision is available for inspection at the office of the secretary of the Commission during working hours and, if also available electronically, the web address.

(2) A notice issued under subregulation (1) must include a statement as to the appeals procedure available.

PART III**DEVELOPMENT WITH SIGNIFICANT TRANSBOUNDARY EFFECTS****Development in Gibraltar likely to have significant effects in a Member State.**

14(1) Where it comes to the attention of the Commission that development to be carried out in Gibraltar is the subject of an EIA application and is likely to have significant effects on the environment in a Member State; or a Member State, likely to be significantly affected by such a development, requests by notice delivered to the Minister, the Minister shall—

- (a) send to the Member State the particulars mentioned in subregulation (2) below as soon as possible and no later than the date of their publication in the Gazette referred to in paragraph (b) below, and, if it thinks fit, the information referred to in subregulation (3) below; and
 - (b) publish the information in paragraph (a) above in the Gazette indicating the address where additional information is available; and
 - (c) give the Member State a reasonable time in which to indicate whether it wishes to participate in the procedure for which these Regulations provide.
- (2) The particulars referred to in subregulation (1)(a) above are-

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**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

- (a) a description of the development together with any available information on its possible significant effect on the environment in a Member State; and
- (b) information on the nature of the decision which may be taken.

(3) Where a Member State indicates in accordance with subregulation (1)(c) above that it wishes to participate in the procedure for which these Regulations provide, the Minister shall as soon as possible send to that Member State the following information–

- (a) a copy of the application concerned;
- (b) a copy of the environmental statement in respect of the development to which that application relates; and
- (c) relevant information regarding the procedure under these Regulations,

but only to the extent that such information has not been provided to the Member State earlier in accordance with subregulation (1)(a) above.

- (4) The Minister, insofar as he is concerned, shall also–
 - (a) arrange for the particulars and information referred to in subregulations (2) and (3) above to be made available, within a reasonable time, to the authorities referred to in article 6(1) of the Directive and the public concerned in the territory of the Member State likely to be significantly affected; and
 - (b) ensure that those authorities and the public concerned are given an opportunity, before a permit for the development is granted, to forward to the Commission, within a reasonable time, their opinion on the information supplied.
- (5) The Minister shall in accordance with article 7(4) of the Directive–
 - (a) enter into consultations with the Member State concerned regarding, inter alia, the potential significant effects of the development on the environment of that Member State and the measures envisaged to reduce or eliminate such effects; and
 - (b) determine in agreement with that Member State a reasonable period of time for the duration of the consultation period.

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

(6) Where a Member State has been consulted in accordance with subregulation (5) above on the determination of the application concerned the Minister shall inform the Member State of the decision and shall cause a statement to be forwarded to it of—

- (a) the content of the decision and any condition attached thereto;
- (b) the main reasons and considerations to which the decision is based; and
- (c) a description where necessary of the main measures to avoid, reduce and, if possible, offset the major adverse effects of the development.

Projects in a Member State likely to have significant transboundary effects.

15.(1) Where the Minister receives from a Member State pursuant to article 7(2) of the Directive information which that Member State has gathered from the developer of a proposed project in that Member State which is likely to have significant effects on the environment in Gibraltar, the Minister shall in accordance with article 7(4) of the Directive—

- (a) enter into consultations with that Member State regarding, inter alia, the potential significant effects of the proposed project on the environment in Gibraltar and the measures envisaged to reduce or eliminate such effects; and
 - (b) determine in agreement with that Member State a reasonable period, before development consent for the project is granted, during which members of the public in Gibraltar may submit to the competent authority in that Member State representations pursuant to article 7(3)(b) of the Directive.
- (2) The Minister, insofar as it is concerned, shall also—
- (a) arrange for the information referred to in subregulation (1) above to be made available within a reasonable time both to the authorities in Gibraltar which it considers are likely to be concerned by the project by reason of their specific environmental responsibilities and to the public in Gibraltar; and
 - (b) ensure that those authorities and the public in Gibraltar are given an opportunity before development consent for the project is granted, to forward to the competent authority in the

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**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

**Subsidiary
2000/013**

relevant Member State within a reasonable time their opinion on the information supplied.

**PART IV
MISCELLANEOUS**

Public development.

16(1). For the purposes of this regulation an “EIA certificate” means a certificate by the Commission that a proposed public development—

- (a) has been environmentally assessed; and
- (b) will not have significant adverse effects on the environment or will embody the best practicable means to prevent or limit such effects.

(2) Where a public body proposes to initiate List 1 development or List 2 development (whether alone or jointly with any other person), the development shall be subjected to an assessment of the environmental effects of the development as provided for under these Regulations.

(3) These Regulations shall apply to a public body as they apply to a person proposing to make a List 1 application or List 2 application (or proposed application) subject to the following modifications—

- (a) these Regulations shall be read as if references to—
 - (i) List1 applications and List 2 applications;
 - (ii) EIA applications;
 - (iii) applications for planning permission;

were a reference to an application for an EIA certificate;

- (b) regulation 3 shall apply as if for that regulation there were substituted:

“ 3. The Commission shall not grant an EIA certificate unless it has first taken the environmental information into consideration and it shall state in its decision that it has done so.”;

- (c) regulations 6, 10 and 11 shall not apply.

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**(4) *Repealed***Amendments to the Town Planning (Applications) Regulations.**

17.(1) Regulation 2 of the Town Planning (Applications) Regulations (hereinafter called “the principal Regulations”) is amended as follows -

- (a) by omitting the brackets and all the words within the brackets;
- (b) by omitting paragraph (b); and
- (c) by re-lettering paragraph (c) as paragraph (b).

(2) Regulation 3 of the principal Regulations is amended by omitting the brackets and all the words within the brackets.

(3) Regulation 4 of the principal Regulations is omitted and substituted therefor by the following new regulation—

“Applications under section 17A.

4. Every application for outline planning permission shall be made in the form provided by the Town Planner for this purpose and shall be accompanied by the fee prescribed in Schedule 3.”.

(4) Schedule 2 of the principal Regulations is revoked.

(5) Nothing in sub-regulations (1) to (4) shall affect the continued application of the provisions revoked by those sub-regulations to any application received by the Commission before the commencement of these Regulations and these Regulations shall not apply to any such application.

SCHEDULE 1

Regulation 2

**DESCRIPTIONS OF DEVELOPMENT FOR THE PURPOSES OF
THE DEFINITION OF “LIST 1 DEVELOPMENT”****Interpretation.**

1. In this Schedule—

“airport” means an airport which complies with the definition in the 1944 Chicago Convention setting up the International Civil Aviation Organisation (Annex 14);

“express road” means a road which complies with the definition in the European Agreement on Main International Traffic Arteries of 15 November 1975;

“nuclear power station” and “other nuclear reactor” do not include an installation from the site of which all nuclear fuel and other radioactive contaminated materials have been permanently removed; and development for the purpose of dismantling or decommissioning a nuclear power station or other nuclear reactor shall not be treated as development of the description mentioned in paragraph 2(2)(b) of this Schedule.

Descriptions of development.

2. The carrying out of development to provide any of the following—

- (1) Crude-oil refineries (excluding undertakings manufacturing only lubricants from crude oil) and installations for the gasification and liquefaction of 500 tonnes or more of coal or bituminous shale per day;
- (2)
 - (a) thermal power stations and other combustion installations with a heat output of 300 megawatts or more;
 - (b) nuclear power stations and other nuclear reactors (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load);
- (3)

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

**Subsidiary
2000/013**

- (a) Installations for the reprocessing of irradiated nuclear fuel.
- (b) Installations designed–
 - (i) for the production or enrichment of nuclear fuel,
 - (ii) for the processing of irradiated nuclear fuel or high-level radioactive waste,
 - (iii) for the final disposal of irradiated nuclear fuel,
 - (iv) solely for the final disposal of radioactive waste,
 - (v) solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site;
- (4)
 - (a) integrated works for the initial smelting of cast-iron and steel;
 - (b) installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes;
- (5) installations for the extraction of asbestos and for the processing and transformation of asbestos and products containing asbestos–
 - (i) for asbestos-cement products. with an annual production of more than 20,000 tonnes of finished products;
 - (ii) for friction material, with an annual production of more than 50 tonnes of finished products; and
 - (iii) for other uses of asbestos, utilisation of more than 200 tonnes per year;
- (6) integrated chemical installations, that is to say, installations for the manufacture on an industrial scale of substances using chemical conversion processes in which several units are juxtaposed and are functionally linked to one another and which are–

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**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

- (i) for the production of basic organic chemicals,
 - (ii) for the production of basic inorganic chemicals,
 - (iii) for the production of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers),
 - (iv) for the production of basic plant health products and of biocides,
 - (v) for the production of basic pharmaceutical products using a chemical or biological process,
 - (vi) for the production of explosives;
- (7)
- (a) construction of lines for long-distance railway traffic and of airports with a basic runway length of 2,100 metres or more;
 - (b) construction of motorways and express roads;
 - (c) construction of a new road of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new road, or realigned and/or widened section of road would be 10 kilometres or more in a continuous length;
- (8) trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes;
- (9) waste disposal installations for the incineration, chemical treatment (as defined in Annex IIA to Council Directive 75/442/EEC under heading D9), or landfill of hazardous waste (that is to say, waste to which Council Directive 91/689/EEC applies);
- (10) waste disposal installations for the incineration or chemical treatment (as defined in Annex IIA to Council Directive 75/442/EEC under heading D9) of non-hazardous waste with a capacity exceeding 100 tonnes per day;

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

**Subsidiary
2000/013**

- (11) groundwater abstraction or artificial groundwater recharge schemes where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.
- (12)
- (a) Works for the transfer of water resources, other than piped drinking water, between river basins where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres per year;
- (b) in all other cases, works for the transfer of water resources, other than piped drinking water, between river basins where the multi-annual average flow of the basin of abstraction exceeds 2,000 million cubic metres per year and where the amount of water transferred exceeds 5% of this flow;
- (13) waste water treatment plants with a capacity exceeding 150,000 population equivalent as defined in Article 2 point (6) of Council Directive 91/271/EEC;
- (14) extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 tonnes per day in the case of petroleum and 500,000 cubic metres per day in the case of gas;
- (15) installations designed for the permanent storage of water, where a new or additional amount of water stored exceeds 10 million cubic metres;
- (16) pipelines for the transport of gas, oil or chemicals with a diameter of more than 800 millimetres and a length of more than 40 kilometres;
- (17) installations for the intensive rearing of poultry or pigs with more than—
- (i) 85,000 places for broilers or 60,000 places for hens;
- (ii) 3,000 places for production pigs (over 30 kg); or
- (iii) 900 places for sows;
- (18) Industrial plants for—

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TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS, 2000

Subsidiary
2000/013

- (i) the production of pulp from timber or similar fibrous materials,
 - (ii) the production of paper and board with a production capacity exceeding 200 tonnes per day;
- (19) quarries and open-cast mining where the surface of the site exceeds 25 hectares;
- (20) construction of overhead electrical power lines with a voltage of 220 kV or more and a length of more than 15 km.;
- (21) installations for storage of petroleum, petrochemical or chemical products with a capacity of 200,000 tonnes or more.
- (22) Any change to or extension of projects listed in this Schedule where such a change or extension in itself meets the thresholds, if any, set out in this Schedule.

1999-39

Town Planning

Subsidiary
2000/013**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****SCHEDULE 2**

Regulation 2

**DESCRIPTIONS OF DEVELOPMENT FOR THE PURPOSES OF
THE DEFINITION OF "LIST 2 DEVELOPMENT"****Description of development.**

1. The carrying out of development to provide any of the following—

(1) Agriculture and aquaculture.

- (a) Water management projects for agriculture, including irrigation and land drainage projects;
- (b) initial afforestation for the purposes of conversion to another land use;
- (c) intensive livestock installations (unless included in Schedule 1);
- (d) intensive fish farming;
- (e) reclamation of land from the sea.

(2) Extractive industry.

- (a) Quarries and open-cast mining (unless included in Schedule 1);
- (b) underground mining;
- (c) extraction of minerals by marine dredging;
- (d) deep drillings. in particular—
 - (i) geothermal drilling;
 - (ii) drilling for the storage of nuclear waste material;
 - (iii) drilling for water supplies;

with the exception of drillings for investigating the stability of the soil.

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**Subsidiary
2000/013

- (e) Surface industrial installations for the extraction of coal, petroleum, natural gas and ores, as well as bituminous shale.

(3) Energy industry.

- (a) Industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1);
- (b) industrial installations for carrying gas, steam and hot water;
- (c) transmission of electrical energy by overhead cables (unless included in Schedule 1);
- (d) surface storage of natural gas;
- (e) underground storage of combustible gases;
- (f) surface storage of fossil fuels;
- (g) industrial briquetting of coal and lignite;
- (h) installations for the processing and storage of radioactive waste (unless included in Schedule 1);
- (i) installations for hydroelectric energy production;
- (j) installations for the harnessing of wind power for energy production (wind farms).

(4) Production and processing of metals.

- (a) Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting;
- (b) installations for the processing of ferrous metals-
 - (i) hot-rolling mills;
 - (ii) smitheries with hammers;
 - (iii) application of protective fused metal coats.
- (c) Ferrous metal foundries;

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**
**Subsidiary
2000/013**

- (d) installations for the smelting, including the alloyage, of non-ferrous metals, excluding precious metals, including recovered products (refining, foundry casting, etc);
 - (e) installations for surface treatment of metals and plastic materials using an electrolytic or chemical process;
 - (f) manufacture and assembly of motor vehicles and manufacture of motor-vehicle engines;
 - (g) shipyards;
 - (h) installations for the construction and repair of aircraft;
 - (i) manufacture of railway equipment;
 - (j) swaging by explosives;
 - (k) Installations for the roasting and sintering of metallic ores.
- (5) Mineral industry.**
- (a) Coke ovens (dry coal distillation);
 - (b) installations for the manufacture of cement;
 - (c) installations for the production of asbestos and the manufacture of asbestos-based products (unless included in Schedule 1);
 - (d) Installations for the manufacture of glass including glass fibre;
 - (e) Installations for smelting mineral substances including the production of mineral fibres;
 - (f) Manufacture of ceramic products by burning, in particular roofing tiles. bricks, refractory bricks. tiles. stoneware or porcelain.
- (6) Chemical industry unless included in Schedule 1.**
- (a) Treatment of intermediate products and production of chemicals;

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**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

- (b) Production of pesticides and pharmaceutical products, paint and varnishes, elastomers and peroxides;
 - (c) Storage facilities for petroleum, petrochemical and chemical products.
- (7) Food industry.**
- (a) Manufacture of vegetable and animal oils and fats;
 - (b) Packing and canning of animal and vegetable products;
 - (c) Manufacture of dairy products;
 - (d) Brewing and malting;
 - (e) Confectionery and syrup manufacture;
 - (f) Installations for the slaughter of animals;
 - (g) Industrial starch manufacturing installations;
 - (h) Fish-meal and fish-oil factories;
 - (i) Sugar factories.
- (8) Textiles, leather, wood and paper industries.**
- (a) Industrial plants for the production of paper and board (unless included in Schedule 1);
 - (b) Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles;
 - (c) Plants for the tanning of hides and skins;
 - (d) Cellulose-processing and production installations.
- (9) Rubber industry.**
- (a) Manufacture and treatment of elastomer-based products.
- (10) Infrastructure projects.**
- (a) Industrial estate development projects;

1999-39

Town Planning

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**
**Subsidiary
2000/013**

- (b) Urban development projects, including the construction of shopping centres and car parks;
- (c) Construction of intermodal transshipment facilities and of intermodal terminals (unless included in Schedule 1);
- (d) Construction of railways (unless included in Schedule 1);
- (e) Construction of airfields (unless included in Schedule 1);
- (f) Construction of roads (unless included in Schedule 1);
- (g) Construction of harbours and port installations including fishing harbours (unless included in Schedule 1);
- (h) Canalisation and flood-relief works;
- (i) Installations designed to store water on a long-term basis (unless included in Schedule 1);
- (j) Tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport;
- (k) Oil and gas pipeline installations (unless included in Schedule 1);
- (l) Installations of long-distance aqueducts;
- (m) Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works;
- (n) Groundwater abstraction and artificial groundwater recharge schemes not included in Schedule 1;
- (o) Works for the transfer of water resources between river basins not included in Schedule 1;

(11) Other projects.

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**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**Subsidiary
2000/013

- (a) Permanent racing and test tracks for motorised vehicles;
- (b) Installations for the disposal of waste (unless included in Schedule 1);
- (c) Waste-water treatment plants (unless included in Schedule 1);
- (d) Sludge-deposition sites;
- (e) Storage of scrap iron, including scrap vehicles;
- (f) Test benches for engines, turbines or reactors;
- (g) Installations for the manufacture of artificial mineral fibres;
- (h) Installations for the recovery or destruction of explosive substances;
- (i) Knackers' yards.

(12) Tourism and leisure.

- (a) Cable-cars and associated developments;
- (b) Marinas;
- (c) Holiday villages and hotel complexes outside urban areas and associated developments;
- (d) Theme parks;
- (e) Permanent camp sites and caravan sites;

(13) Changes to or extensions of development.

- (a) Any change to or extension of development of a description listed in Schedule 1 (other than a change or extension falling within paragraph 22 of that Schedule) or in paragraphs 1 to 12 of this Schedule, where that development is already authorised, executed or in the process of being executed, and the change or extension may have significant adverse effects on the environment;
- (b) Development of a description mentioned in Schedule 1 undertaken exclusively or mainly for the development

1999-39

Town Planning

TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)

**Subsidiary
2000/013**

REGULATIONS, 2000

and testing of new methods or products and not used for more than two years.

SCHEDULE 3

Regulation 4(2)

**SELECTION CRITERIA FOR SCREENING LIST 2
DEVELOPMENT**

Characteristics of development

1. The characteristics of development must be considered having regard, in particular, to –

- (a) the size of the development;
- (b) the cumulation with other developments;
- (c) the use of natural resources;
- (d) the production of waste;
- (e) pollution and nuisances;
- (f) the risk of accidents, having regard in particular to substances or technologies used.

Location of development

2. The environmental sensitivity of geographical areas likely to be affected by development must be considered, having regard, in particular, to –

- (a) the existing land use;
- (b) the relative abundance, quality and regenerative capacity of natural resources in the area;
- (c) the absorption capacity of the natural environment, paying particular attention to the following areas –
 - (i) wetlands;
 - (ii) coastal zones;
 - (iii) mountain and forest areas;
 - (iv) nature reserves and parks;
 - (v) areas classified or protected under Member States' legislation; areas designated by Member States pursuant to Council Directive 79/409/EEC on the conservation of wild birds(a) and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora;
 - (vi) areas in which the environmental quality standards laid down in Community legislation have already been exceeded;

1999-39**Town Planning****TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000****Subsidiary
2000/013**

- (vii) densely populated areas;
- (viii) landscapes of historical, cultural or archaeological significance.

Characteristics of the potential impact

3. The potential significant effects of development must be considered in relation to criteria set out under paragraphs 1 and 2 above, and having regard in particular to—

- (a) the extent of the impact (geographical area and size of the affected population);
- (b) the transfrontier nature of the impact;
- (c) the magnitude and complexity of the impact;
- (d) the probability of the impact;
- (e) the duration, frequency and reversibility of the impact.

SCHEDULE 4

Regulation 2(1)

**INFORMATION FOR INCLUSION IN ENVIRONMENTAL
STATEMENTS**

PART I

1. Description of the development, including in particular-
 - (a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;
 - (b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;
 - (c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.
2. An outline of the main alternatives studied by the developer and an indication of the main reasons for his choice, taking into account the environmental effects.
3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.
4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from -
 - (a) the existence of the development;
 - (b) the use of natural resources;
 - (c) the emission of pollutants, the creation of nuisances and the elimination of waste,

and the description by the applicant of the forecasting methods used to assess the effects on the environment.

1999-39**Town Planning****Subsidiary
2000/013****TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
6. A non-technical summary of the information provided under paragraphs I to 5 of this Part.
7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the developer in compiling the required information.

PART II

1. A description of the development comprising information on the site, design and size of the development.
2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.
3. The data required to identify and assess the main effects which the development is likely to have on the environment.
4. An outline of the main alternatives studied by the developer and an indication of the main reasons for his choice taking into account the environmental effects
5. A non-technical summary of the information provided under paragraphs I to 4 of this Part.

TOWN PLANNING ACT

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS 2000**

SCREENING DIRECTION UNDER REGULATION 4(5)

Reference: BA 11849

Date of application: 1 September 2011

Location: Container Berth, North Mole Road, Gibraltar.

Proposal: Containment Bund and Tank Farm.

Applicant: Horatio Holdings Ltd/MH Blands, c/o AKS
Architects & Engineers Ltd.

In accordance with the requirements of the above regulations I hereby determine that the above List 2 development is an 'EIA development' for the purposes of the said Regulations. The applicant shall therefore be required to submit an environmental statement to accompany their applications for planning permission.

Dated the 14th day of June, 2012.

1999-39

Town Planning

**Subsidiary
2000/013**

**TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS, 2000**
LEGAL NOTICE NO. 95 OF 2012.

**TOWN PLANNING ACT
TOWN PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT)
REGULATIONS 2000**

SCREENING DIRECTION UNDER REGULATION 4(5)

Reference: 1281/33
Date of application: June 2012
Location: Western Beach
Proposal: Proposed reclamation for beach car park
Applicant: Government of Gibraltar.

In accordance with the requirements of the above regulations I have determined that the above List 2 development is an 'EIA development' for the purposes of the said Regulations.

Dated 5th July, 2012.

Town Planning (General Procedures) Regulations 2001

Town Planning**1999-39**

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****Subsidiary
2001/025**

Regulations made under section 23 and 44 of the Town Planning Act.

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****(LN. 2001/025)****5.4.2001**

Amending enactments	Relevant current provisions	Commencement date
None		

ARRANGEMENT OF REGULATIONS

PART I
Preliminary

Regulation

1. Title.
2. Interpretation.

PART II
Applications

3. Applications under section 17.
4. Applications under section 18.

PART III
Notification

5. Publication of notices of applications.
6. Notification of applications to owners.
7. Notice of appeal.
8. Written notice of decision relating to a planning application.

PART IV
Register

9. Register of applications and decisions.

PART V
Outline Planning Permission

10. Outline applications.
11. Application for approval of reserved matters.

PART VI
Directions and Consultations.

12. Directions by the Minister.
13. Development not in accordance with the Planning Scheme.
14. Consultations before the grant of a permit.

PART VII
Change of Use

15. Use classes.
16. Change of use of part of building or land.

Town Planning**1999-39****TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****Subsidiary
2001/025****PART VIII
Revocations**

17. Revocation.

SCHEDULES**Schedule 1**

1. Notice under sections 19(3) and 19(4).
2. Certificate under section 19(3).

Schedule 2

1. Certificate under section 21(1)(a).
1. Certificate under section 21(1)(b).
1. Certificate under section 21(1)(c).
1. Certificate under section 21(1)(d).
2. Notice under section 21(2) of application for planning permission.

Schedule 3

Notice to be sent to an applicant when the Commission refuses a permit or grants it subject to conditions.

Schedule 4

Description of development and Consultee.

Schedule 5

Classes under regulation 15.

Schedule 6

Fees Payable.

Town Planning

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001
PART I**
*Preliminary***Title.**

1. These Regulations may be cited as the Town Planning (General Procedures) Regulations, 2001.

Interpretation.

2.(1) Expressions used both in these Regulations and in the Act have the same meaning for the purposes of these Regulations as they have for the purposes of the Act.

(2) Any references in these Regulations to the height of a building shall be construed as a reference to its height when measured from ground level and “ground level” means the level of the surface of the ground immediately adjacent to the building in question or, where the level of the surface of the ground on which it is situated or is to be situated is not uniform, the level of the highest part of the surface of the ground adjacent to it.

PART II*Applications***Applications under section 17.**

3.(1) An application under section 17 of the Act, other than for a change of use of any building or land, shall—

- (a) be made in the form provided by the Town Planner for this purpose;
- (b) be accompanied by the plans, drawings and specifications set out in Schedule 1 hereto; and
- (c) be accompanied by the fee prescribed in Schedule 6.

(2) An application under section 17 of the Act for a change of use of any building or land shall—

- (a) be made in the form provided by the Town Planner for this purpose; and
- (b) be accompanied by the fee prescribed in Schedule 6.

Town Planning**1999-39****TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****Subsidiary
2001/025****Applications under section 18.**

4. An application for outline planning permission under section 18 of the Act shall—
- (a) be made in the form provided by the Town Planner for this purpose; and
 - (b) be accompanied by the fee prescribed in Schedule 6.

PART III*Notification***Publication of notices of applications.**

- 5.(1) The following classes of development are designated for the purposes of section 19 of the Act—
- (a) the construction of buildings to a height exceeding 4 metres;
 - (b) the construction of buildings or the use of land for the purposes of a casino, a funfair or a bingo hall, a theatre, a cinema, a music or concert hall, a dance hall, a skating rink, a sportshall, a swimming pool or gymnasium (not forming part of a school, or college), or a Turkish or other vapour or foam bath;
 - (c) the construction of buildings or the use of land for the purposes of a hotel, motel, guest or boarding house or other premises providing sleeping accommodation;
 - (d) the construction of buildings or the use of land for the purposes of a distillery, brewery, inn or bar, restaurant or eating house including fast-foods restaurants;
 - (e) the construction of buildings or the use of land for the purposes of a place of religious worship or religious instructions;
 - (f) the construction of buildings or the use of land for the purposes of a museum, art gallery, library or exhibition or meeting hall;
 - (g) the construction of buildings or the use of land for the purposes of an educational establishment or club;

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**

- (h) the construction of buildings or the use of land for the purposes of a hospital, nursing home, hospice, health or medical clinic, old peoples home or home for the boarding and care of children;
- (i) the construction of buildings or the use of land as a zoo, aquarium or for the business of boarding or breeding cats or dogs;
- (j) the construction of a stadium;
- (k) the construction of buildings or other operations or the use of land for the disposal of waste materials or the use of land as a scrap yard;
- (l) the use of land as a crematorium;
- (m) the construction of buildings or other operations or the use of land for shops, warehouses or industrial buildings, consisting of factories as defined in section 5(1) of the Factories Act (with or without office accommodation) or petrol filling stations or for offices for any purpose;
- (n) the construction of buildings or other operations or the use of land for retaining, treating or disposing of sewage, trade waste or sludge (other than the laying of sewers, the construction of pumphouses in a line of sewers or the construction of septic tanks and cesspools serving single dwelling houses, single buildings or single caravans in which not more than ten people will normally reside, work or congregate, and works ancillary thereto);
- (o) the construction of buildings or the use of land for the purposes of a slaughter-house or for killing or plucking poultry.
- (p) the construction of extensions of one or more additional storeys to existing buildings which would fall to be regarded as a class of development mentioned in paragraphs (a) to (o) above.

(2) The notice of an application required to be published under section 19(3)(a) of the Act shall be in the form set out in Part 1 of Schedule 1 hereto, and the copy of the notice accompanying the application shall be certified by or on behalf of the applicant as having been published in the Gazette and named newspapers on a date specified in the certificate.

Town Planning

1999-39

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

**Subsidiary
2001/025**

(3) Certificates issued for the purposes of section 19(3)(b) of the Act shall be in the forms set out in Part 2 of Schedule 1 hereto.

(4) The notice required by section 19(4) of the Act to be posted on the land shall be in the form set out in Part 1 of Schedule 1 hereto.

Notification of applications to owners.

6.(1) The certificate issued for the purposes of section 21(1) of the Act shall be in the appropriate form set out in Part 1 of Schedule 2 hereto.

(2) The requisite notice for the purposes of section 21(2) as it applies to applications shall be in the form set out in Part 2 of Schedule 2 hereto.

Notice of appeal.

7.(1) An applicant who wishes to appeal to the Tribunal under section 24 or 25 of the Act shall give notice of appeal by—

- (a) serving on the secretary of the Commission together with the notice such of the documents specified in sub-regulation (2) below as are relevant to the appeal; and
- (b) serving on the persons, if any, who made representations under section 22(3) of the Act on the application, a copy of the notice mentioned in sub-regulation (a) above as soon as reasonably practicable.

(2) The documents mentioned in sub-regulation (1) above are—

- (a) the application made to the Commission which has occasioned the appeal;
- (b) all plans, drawings and documents sent to the Commission in connection with the application;
- (c) all correspondence with the Commission relating to the application;
- (d) any notice provided to the Commission in accordance with section 19 of the Act;
- (e) any certificate provided to the Commission under section 21 of the Act .
- (f) the notice of the decision or determination, if any.

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**
Written notice of decision relating to a planning application.

8. When the Commission gives notice of a decision or determination—
- (a) on an application for planning permission and a permit is granted subject to conditions or the application is refused, the notice shall—
 - (i) state clearly and precisely its full reasons for the refusal or for any condition imposed; and
 - (ii) where the Minister has given a direction restricting the grant of a permit for the development for which application was made, give details of the direction

and shall be accompanied by a notification in the terms (or substantially in the terms) set out in Schedule 3 hereto;
 - (b) such notice shall include a statement to the effect that, if the applicant is aggrieved by its decision, he may appeal to the Tribunal under section 24 of the Act within 28 days of receipt thereof or such longer period as the Commission may at any time allow.

PART IV
Register
Register of applications and decisions.

9.(1) The register of applications for planning permission required to be kept by the Commission under section 31 of the Act shall be kept in two parts. Part I shall contain—

- (a) a copy (which may be photographic) of the application and of plans and drawings submitted in relation thereto;
- (b) a copy of the direction (if any) given under the Act in respect of the application;

and Part II shall contain, in respect of every application for planning permission:

- (c) particulars of the application, including the name and address of the applicant, the date of the application and brief particulars of the proposal forming the subject of the application;

Town Planning

1999-39

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**

**Subsidiary
2001/025**

- (d) the decision (if any) of the Commission in respect of the application, including details of any conditions subject to which the permit was granted, and the date of such decision.

(2) The date when the application was received shall be taken to be the date when each of the following events has occurred—

- (a) the application form has been lodged with the Commission;
- (b) any certificate or documents required by the Act has been lodged with the Commission; and
- (c) any fee required to be paid in respect of the application has been paid.

(3) Every entry in the register shall be made within 14 days of the receipt of an application, or of the giving or makings of the relevant direction, decision or approval as the case may be.

(4) The register shall be kept at the office of the Secretary of the Commission.

PART V

Outline Planning Permission

Outline applications.

10.(1) Where an application is made to the Commission for outline planning permission under section 18 of the Act, it may grant permission subject to a condition specifying reserved matters relating to the siting, design or external appearance, landscaping or the means of access to the building, for its subsequent approval.

(2) Where the Commission is to determine an application for outline planning permission and it is of the opinion that, in the circumstances of the case, the application ought not to be considered separately from all or any of the reserved matters, it shall within the period of 28 days beginning with the receipt of the application notify the applicant that it is unable to determine it unless further details are submitted, specifying the further details it requires.

Application for approval of reserved matters.

11. An application for approval of reserved matters shall be made in writing to the Commission and shall include such particulars, and be accompanied by such plans and drawings, as are necessary to deal with the matters reserved in the outline planning permission.

Town Planning

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****PART VI***Directions and Consultations***Directions by the Minister.**

12.(1) The Minister may give directions restricting the grant of a permit by the Commission, either indefinitely or during such a period as may be specified in the directions, in respect of any development or in respect of development of any class so specified.

(2) The Commission shall deal with applications for planning permission for development to which a direction given under this regulation applies, in such manner as to give effect to the direction.

Development not in accordance with the Planning Scheme.

13. The Commission may in such cases and subject to such conditions as may be prescribed by directions given by the Minister under regulation 12(1), grant a permit for a development which does not accord with the provisions of the planning scheme.

Consultations before the grant of a permit.

14.(1) Before granting a permit for a development which, in its opinion, falls within a category set out in Schedule 4 hereto, the Commission shall consult the authority or person mentioned in relation to that category.

(2) The Minister may give directions to the Commission requiring it to consult with any other person or body named in the directions, in any case or class of case specified in the directions.

(3) Where, by or under this regulation the Commission is required to consult any person or body (“the consultee”) before granting a permit—

- (a) it shall, unless an applicant has served a copy of an application for planning permission on the consultee, give notice of the application to the consultee; and
- (b) it shall not determine the application until at least 14 days after the date on which notice is given under paragraph (a) above or if earlier, 14 days after the date of service of a copy of the application on the consultee by the applicant.

(4) The Commission shall, in determining the application, take into account any representations received from a consultee.

Town Planning**1999-39****TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****Subsidiary
2001/025****PART VII***Change of Use***Use classes.**

15.(1) Where a building or other land is used for a purpose of any class specified in Schedule 5 hereto, the use of that building or that other land for any other purpose of the same class shall not be taken to involve development of the land.

(2) References in paragraph (1) to a building include references to land occupied with the building and used for the same purposes.

(3) A use which is included in and ordinarily incidental to any use in a class specified in Schedule 5 hereto, is not excluded from the use to which it is incidental merely because it is specified in the Schedule as a separate use.

(4) No class specified in Schedule 5 hereto, includes use—

- (a) as a theatre,
- (b) as an amusement arcade or centre, or a funfair,
- (c) for the washing or cleaning of clothes or fabrics in coin-operated machines or on premises at which the goods to be cleaned are received direct from the visiting public,
- (d) for the sale of fuel for motor vehicles,
- (e) for the sale or display for sale of motor vehicles,
- (f) as a scrapyard, or a yard for the storage or distribution of minerals or the breaking of motor vehicles.

Change of use of part of building or land.

16. In the case of a building used for a purpose within class C3 (dwelling houses) in Schedule 5 hereto, the use as a separate dwelling house of any part of the building or of any land occupied with and used for the same purposes as the building shall be taken to involve development.

PART VIII*Revocations*

Revocation.

17. The following Regulations are revoked–

- (a) The Town Planning (Change of Use) Regulations; and
- (b) The Town Planning (Applications) Regulations.

1999-39

Town Planning

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

Subsidiary 2001/025

SCHEDULE 1

Regulation 5

PART 1

TOWN PLANNING ACT

NOTICE UNDER SECTION 19(3) *(to be published in the Gazette and in local newspapers)

NOTICE UNDER SECTION 19(4) *(to be displayed on site)

Proposed development at (a)

I give notice that (b)

is applying to the Development and Planning Commission

for planning permission to (c)

Members of the public may inspect copies of:

- the application
• the plans
• and other documents submitted with it

at the office of the secretary of the Development and Planning Commission during working hours until (d)

Anyone who wishes to make representations about this application should write to the Development and Planning Commission at (e)by (d)

Signed.....

*On behalf of.....

Date.....

* delete where appropriate

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

Subsidiary 2001/025

Insert:

- (a) address or location of the proposed development
(b) applicant's name
(c) description of the proposed development, including the relevant class designated in sub-regulation 3 of the Town Planning (Miscellaneous Provisions) Regulations.
(d) date giving a period of not less than 21 days, beginning with the date when the notice is published or first displayed on site (as the case may be)
(e) address of the Commission

PART 2

TOWN PLANNING ACT

CERTIFICATE UNDER SECTION 19(3)

Certificate A

I certify that:

- I/The applicant* posted the notice required by section 19(4) of the Act on the land which is the subject of the accompanying application.
This notice was left in position for at least 14 days in a period of not more than one month immediately preceding the making of the application.

or

Certificate B

I certify that:

I have/The applicant has* been unable to post the notice required by section 19(4) of the Act on the land which is the subject of the accompanying application because I have/the applicant has* no rights of access or other rights in respect of the land as would enable me/the applicant* to do so.

I have/The applicant has* taken the following steps to acquire those rights, but have/has* been unsuccessful.

(a).....
.....

Town Planning

1999-39

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

Subsidiary 2001/025

or

Certificate C

I certify that:

- I/The applicant* posted the notice required by section 19(4) of the Act on the land which is the subject of the accompanying application.
- It was, however, left in position for less than 14 days in a period of not more than one month immediately preceding the making of the application.
- This happened because it was removed/obscured/defaced* before 14 days had passed during the period of one month mentioned above. This was not my/the applicant's fault or intent.
- I/The applicant* took the following steps to protect and replace the notice:

(a).....
.....

Signed.....

*On behalf of.....

Date.....

*delete where appropriate

Insert:

(a) *description of steps taken*

Gibraltar Neanderthals

SCHEDULE 2

Regulation 6

PART 1

TOWN PLANNING ACT

CERTIFICATE UNDER SECTION 21(1)(a)

Certificate A(a)

I certify that at the beginning of the period of 21 days ending with the date of the accompanying application nobody, except the application, was the owner(b) of any part of the land to which the application relates.

Signed.....

*On behalf of.....

Date.....

*delete where appropriate

(a) *This Certificate is for use with applications for planning permission, (section 22 of the Act). One of Certificates A, B, C or D must be completed.*

(b) *“owner” in relation to any land, means a person who is for the time being the owner in respect of the fee simple thereof or is entitled to a tenancy thereof.*

Town Planning

1999-39

TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001
TOWN PLANNING ACT

Subsidiary
2001/025

CERTIFICATE UNDER SECTION 21(1)(b)*

Certificate B(a)

I certify that I have/The applicant has* given the required notice to everyone else who, at the beginning of the period of 21 days ending with the date of the accompanying application was the owner (b) of any part of the land to which the application relates, as listed below.

Table with 3 columns: Owner's (b) name, Address at which notice was served, Date on which notice was served

Signed.....

*On behalf of.....

Date.....

* delete where appropriate

- (a) This Certificate is for use with applications for planning permission, (section 22 of the Act). One of Certificates A, B, C or D must be completed.
(b) "owner" in relation to any land, means a person who is for the time being the owner in respect of the fee simple thereof or is entitled to a tenancy thereof.

TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001
TOWN PLANNING ACT

Subsidiary
2001/025

CERTIFICATE UNDER SECTION 21(1)(c)

Certificate C(a)

I certify that:

- I/The applicant* cannot issue a certificate in accordance with either paragraph (a) or paragraph (b) of section 21(1) of the Act in respect of the accompanying application.
I have/The applicant has* given the requisite notice to the persons specified below, being persons who at the beginning of the period of 21 days ending with the date of the application*, were owners (b) of any part of the land to which the application relates.

Table with 3 columns: Owner's (b) name, Address at which notice was served, Date on which notice was served

- I have/The applicant has* taken all steps as are reasonably open to me/him/her* to ascertain the names and addresses of the other owners (b) of the land, or of a part of it, but have/has* been unable to do so. These steps were as follows:-

(c)

.....
....
.....
....

Notice of the application, as attached to this Certificate, has been published in the Gazette and in the (d)on (e).....

Signed.....

*On behalf of.....

Date.....

Town Planning

1999-39

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001****Subsidiary
2001/025**

- (a) *This Certificate is for use with applications for planning permission. (section 22 of the Act). One of certificates A, B, C or D must be completed.*
- (b) *“owner” in relation to any land, means a person who is for the time being the owner in respect of the fee simple thereof or is entitled to a tenancy thereof.*

Insert:

- (c) *description of steps taken*
- (d) *names of local newspapers*
- (e) *date of publication (which must be not earlier than the beginning of the period of 21 days ending with the date of the application.*

TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001
TOWN PLANNING ACT

CERTIFICATE UNDER SECTION 21(1)(d)

Certificate D(a)

I certify that:

- I/The applicant* cannot issue a certificate in accordance with paragraph (a) of section 21(1) of the Act in respect of the accompanying application.
- I/The applicant have/has* taken all reasonable steps open to me/him/her* to find out the names and addresses of everyone else who, at the beginning of the period of 21 days beginning with the date of the application, was the owner(b) of any part of the land to which the application relates, but have/has* been unable to do so. These steps were as follows:–

(c).....
.....
....

- Notice of the application as attached to this certificate, has been published in the Gazette and in (d).....on (e).....

Signed.....

*On behalf.....

Date.....

**delete where appropriate*

(a) *This Certificate is for use with applications for planning permission, (section 22 of the Act). One of certificates A, B, C or D must be completed.*

(b) *“owner” in relation to any land, means a person who is for the time being the owner in respect of the fee simple thereof or is entitled to a tenancy thereof.*

Insert:

Town Planning

1999-39

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

Subsidiary 2001/025

- (c) description of steps taken
(d) name of local newspaper
(e) date of publication (which must be not earlier than the beginning of the period of 21 days ending with the date of the application).

PART 2

TOWN PLANNING ACT

NOTICE UNDER SECTION 21(2) OF APPLICATION FOR PLANNING PERMISSION (to be published in the Gazette and a local newspaper)

Proposed development at
(a).....
I give notice that
(b).....
is applying to the Development and Planning Commission for planning permission
to(c).....

Any owner* of the land who wishes to make representations about this application should write to the Development and Planning Commission at(d).....
.....
within 21 days of the date of publication of this notice.

Signed.....

On behalf of.....

Date.....

*delete where appropriate

*"owner" in relation to any land, means a person who is for the time being the owner in respect of the fee simple thereof or is entitled to a tenancy thereof.

Insert:

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**

**Subsidiary
2001/025**

- (a) address or location of the proposed development*
- (b) applicant's name*
- (c) description of the proposed development*
- (d) address of the Commission.*

1999-39

Town Planning

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**

**Subsidiary
2001/025**

SCHEDULE 3

Regulation 8

TOWN PLANNING ACT

Notice to be sent to an applicant when the Commission refuses a permit or grants it subject to conditions *(To be endorsed on notices of decision).*

Appeals to the Development Appeals Tribunal.

- If you are aggrieved by the decision of the Development and Planning Commission to refuse a permit for the proposed development or to grant it subject to conditions, then you can appeal to the Development Appeals Tribunal under section 24 of the Town Planning Act.
- If you want to appeal, then you must do so within 28 days of the date of this notice.
- The Development and Planning Commission can allow a longer period for giving notice of an appeal, but it will not normally be prepared to do so unless there are special circumstances which excuse the delay in giving notice of appeal.
- The Development Appeals Tribunal need not consider an appeal if it seems to the Tribunal that the Commission could not have granted a permit for the proposed development or could not have granted it without the conditions it imposed, having regard to statutory requirements.

Date.....

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**
SCHEDULE 4**Regulation 14****DESCRIPTION OF DEVELOPMENT****CONSULTEE**

(a) Development likely to affect land in the Nature Reserve.

The Gibraltar Ornithological and Natural History Society.

(b) Development involving the manufacture, processing, keeping or use of a hazardous substance in such circumstances that there will at any one time be, or is likely to be, a notifiable quantity of such substance in, on, over or under any land.

The Health and Safety Inspectorate

(c) Development likely to result in a material increase in the volume or a material change in the character of traffic.

The Minister with responsibility for transport.

(d) Development likely to result in a material increase in the volume or a material change in the character of traffic entering or leaving an existing or proposed road.

The Minister with responsibility for transport.

(e) Development likely to prejudice the improvement or construction of an existing or proposed road.

The Minister with responsibility for transport.

(f) Development of land involving the demolition, in whole or part, or the material alteration of a listed building.

The Heritage and Planning Division

(g) Development likely to affect the site of a listed building.

The Heritage and Planning Division

(h) Development for the purpose of refining or storing mineral oils and their derivatives.

The Environmental Agency

(i) Development involving the use of land for the deposit of refuse or waste.

The Environmental Agency

Town Planning**1999-39****TOWN PLANNING (GENERAL PROCEDURES)****REGULATIONS 2001****Subsidiary
2001/025**

(j) Development relating to the retention, treatment or disposal of sewage, trade-waster, slurry or sludge (other than the laying of sewers, the construction of pumphouses in a line of sewers, the construction of septic tanks and cesspools serving single dwelling-houses or single caravans or single buildings in which not more than ten people will normally reside, work or congregate, and works ancillary thereto).

The
Environmental
Agency

(k) Development relating to the use of land as a crematorium.

The
Environmental
Agency

SCHEDULE 5

Regulation 15

PART A

Class A1. Shops

Use for all or any of the following purposes–

- (a) for the retail sale of goods other than hot food,
- (b) for the sale of tickets or as a travel agency,
- (c) for the sale of sandwiches or other cold food for consumption off the premises,
- (d) for hairdressing,
- (e) for the direction of funerals,
- (f) for the display of goods for sale,
- (g) for the hiring out of domestic or personal goods or articles,
- (h) for the reception of goods to be washed, cleaned or repaired,

where the sale, display or service is to visiting members of the public.

Class A2. Financial and professional services

Use for the provision of–

- (a) financial services, or
- (b) professional services (other than health or medical services), or
- (c) any other services (including use as a betting office) which it is appropriate to provide in a shopping area,

where the services are provided principally to visiting members of the public.

Class A3. Food and drink

Town Planning

1999-39

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

**Subsidiary
2001/025**

Use for the sale of food or drink for consumption on the premises or of hot food for consumption off the premises.

PART B

Class B1. Business

Use for all or any of the following purposes–

- (a) as an office other than a use within class A2,
- (b) for research and development of products or processes, or
- (c) for any industrial process,

being a use which can be carried out in any residential area without detriment to the amenity of that area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit.

Class B2. General industrial

Use for the carrying on of an industrial process for or incidental to any of the following purposes–

- (a) the making of any article or part of any article (including a ship or vessel, or a film, video or sound recording);
- (b) the altering, repairing, maintaining, ornamenting, finishing, cleaning, washing, packing, canning, adapting for sale, breaking up or demolition of any article; or
- (c) the getting, dressing or treatment of minerals;

in the course of any trade or business.

Class B3. Storage or distribution

Use for storage or as a distribution centre.

PART C

Class C1. Hotels and hostels

Use as a hotel, boarding or guest house or as a hostel where, in each case, no significant element of care is provided.

Class C2. Residential Institutions

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**

Use for the provision of residential accommodation and care to people in need of care (other than a use within class C3).

Use as a hospital or nursing home.

Use as a residential school, college or training centre.

Class C3. Dwelling houses

Use as a dwelling house (whether or not as a sole or main residence)–

- (a) by a single person or by people living together as a family, or
- (b) by not more than 6 residents living together as a single household (including a household where care is provided for residents).

PART D**Class D1. Non-residential institutions**

Any use not including a residential use–

- (a) for the provision of any medical or health services except the use of premises attached to the residence of the consultant or practitioner,
- (b) as a creche, day nursery or day centre,
- (c) for the provision of education,
- (d) for the display or works of art (otherwise than for sale or hire),
- (e) as a museum,
- (f) as a public library or public reading room,
- (g) as a public hall or exhibition hall,
- (h) for, or in connection with, public worship or religious instruction.

Class D2. Assembly and leisure

Use as–

Town Planning

1999-39

TOWN PLANNING (GENERAL PROCEDURES) REGULATIONS 2001

**Subsidiary
2001/025**

- (a) a cinema,
- (b) a concert hall,
- (c) a bingo hall or casino,
- (d) a dance hall,
- (e) a swimming bath, skating rink, gymnasium or area for other indoor or outdoor sports or recreations, not involving motorised vehicles or firearms.

SCHEDULE 6

Regulations 3 and 4

Nature of Application

Fee Payable

1. Applications for outline planning permission.

- | | |
|--|--|
| (1) Application for the erection of dwelling houses. | £60 up to 500m ² , £120 for over 500m ² of the site area, subject to a maximum of £4,000 |
| (2) Application for the erection of buildings other than buildings falling within subparagraphs (1), (3), (4), (5) or (7). | <ul style="list-style-type: none"> (i) Where the area of gross floor space to be created by the development does not exceed 40m² £60. (ii) Where the area of gross floor space to be created by the development exceeds 40m² but does not exceed 75m² £120. (iii) Where the area of gross floor space to be created by the development exceeds 75m² £120 for each 75m² (or part thereof) subject to a maximum of £6,000. |
| (3) Application for the erection on land used for the purpose of agriculture or buildings to be | £120 up to 100m ² (or part thereof) of the site area subject to a maximum of £3,000 |

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**

used for agricultural purposes other than buildings falling within subparagraph (4).

(4) Application for the erection of glass houses on land used for the purpose of agriculture.	£60 where the gross floor space to be created by the development does not exceed 500m ² .
(5) Application for the erection, alteration or replacement of plant and machinery.	£120 up to 500m ² (or part thereof) of the site area, subject to a maximum of £6,000.
(6) Application for the construction of car parks, multi-storey car parks, service roads and other means of access.	£120
(7) Application for the carrying out of any operations not coming within any of the above categories.	£60 up to 500m ² (or part thereof) subject to a maximum of £6,000.
(8) Application for the making of a material change in the use of a building or land.	£120
(9) Application to demolish a building and/or structure where 70% of the estimated cost is—	
Under £5,000	£50
between £5,000 – £10,000	£80
£10,000 – £15,000	£100
£15,000 – £30,000	£120
£30,000 – £50,000	£150
exceeding £50,000	£180

2. Building Application fees:-

	Plan fee	Inspection Fee
	£	£
(1) Domestic Extension		
Under 20m ²	21.00	64.00

Town Planning

1999-39

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**

Under 40m ²	42.00	128.00
Over 40m ² and not exceeding 80m ²	60.00	180.00
Detached garage or car port	21.00	64.00
Loft conversion	42.00	128.00
(2) Application for the enlargement, improvement or other alteration of existing dwelling houses	21.00	64.00
(3) New houses and flats		
No of dwelling 1	79.00	132.00
2	158.00	264.00
3	258.00	396.00
4	316.00	528.00
5	396.00	660.00
6	448.00	792.00
7	500.00	924.00
8	556.00	1056.00
9	605.00	1188.00
10	658.00	1320.00
11	686.00	1452.00
12	732.00	1484.00
13	738.00	1716.00
14	764.00	1848.00
15	790.00	1980.00
16	818.00	2112.00
17	845.00	2244.00
18	870.00	2376.00
19	897.00	2508.00
20 and over	922.00	2640.00
(4) All other works where 70% of the estimated cost is under £1,000	9.00	27.00
Between £ and £		
1000 - 2000	15.00	45.00
2000 - 3000	18.00	54.00
3000 - 4000	24.00	72.00
4000 - 5000	30.00	90.00
5000 - 6000	36.00	103.00
6000 - 7000	42.00	125.00
7000 - 8000	48.00	143.00
8000 - 9000	50.00	152.00

**TOWN PLANNING (GENERAL PROCEDURES)
REGULATIONS 2001**
**Subsidiary
2001/025**

9000 - 10000	54.00	161.00
10000 - 12000	60.00	180.00
12000 - 14000	69.00	206.00
14000 - 16000	78.00	235.00
16000 - 18000	87.00	260.00
18000 - 20000	96.00	287.00
20000 - 25000	112.00	336.00
25000 - 30000	127.00	381.00
30000 - 35000	147.00	426.00
35000 - 40000	164.00	493.00
40000 - 45000	180.00	538.00
45000 - 50000	194.00	585.00
50000 - 60000	217.00	650.00
60000 - 70000	254.00	762.00
70000 - 80000	282.00	875.00
80000 - 90000	314.00	942.00
90000 - 100000	344.00	1032.00
100000 - 140000	381.00	1144.00
140000 - 180000	493.00	1480.00
180000 - 240000	613.00	1538.00
240000 - 300000	762.00	2287.00
300000 - 400000	918.00	2736.00
400000 - 500000	1158.00	3476.00
500000 - 700000	1360.00	4681.00
700000 - 1000000	1771.00	5315.00
and thereafter for each additional £100,000 or part thereof	300.00	897.00

Town Planning (Building Development Control) Regulations 2001

**TOWN PLANNING (BUILDING DEVELOPMENT CONTROL)
REGULATIONS 2001**

**Subsidiary
2001/026**

Regulations made under section 44 of the Town Planning Act.

**TOWN PLANNING (BUILDING DEVELOPMENT
CONTROL) REGULATIONS 2001**

(LN. 2001/026)

5.3.2001

Amending enactments	Relevant current provisions	Commencement date
None		

1999-39

Town Planning

**TOWN PLANNING (BUILDING DEVELOPMENT CONTROL)
REGULATIONS 2001**

**Subsidiary
2001/026**

Title.

1. These regulations may be cited as the Town Planning (Building Development Control) Regulations, 2001.

Interpretation.

2. In these regulations, unless the context otherwise requires—

“building permit” means a permit granted by the Commission to erect, re-erect or alter any building;

“floor space index” means, subject to the provisions of regulation 7(3), the proportion which the aggregate area of the floor space within a building bears to the area of the plot;

“plot” means the parcel of land to which the building permit relates;

“works” means the works to be carried out by virtue of a building permit.

Application.

3.(1) These regulations shall apply, except so far as the context otherwise requires, in relation to every application for a building permit and to the grant thereof:

Provided that—

- (a) in relation to a permit to alter a building, they shall not apply if, and in so far as, the Commission is satisfied that their application is impracticable having regard to the limits of the alteration;
- (b) the Commission may, in its discretion, in any particular case if, and in so far as, it is satisfied that it is necessary or expedient so to do—
 - (i) relax or dispense with any requirement of these regulations;
 - (ii) impose a more stringent requirement as to the number of car spaces to be provided in any application for a building permit or grant thereof.

1999-39

Town Planning

**TOWN PLANNING (BUILDING DEVELOPMENT CONTROL)
REGULATIONS 2001**
**Subsidiary
2001/026**

(2) If the Commission shall have imposed a more stringent requirement under the provisions of sub-regulation (1) it shall be deemed to be a condition for the purposes of section 24 of the Act.

(3) If there shall be a conflict between these regulations and any other subsidiary legislation relating to the works, these regulations shall prevail; but save as aforesaid, nothing in these regulations shall exempt any person from compliance with such other subsidiary legislation.

Ground floor area.

4. No building shall cover more than 80% of the area of the plot:

Provided that in Main Street the whole of the area may be so covered, except so far as the Commission may otherwise direct in order to secure adequate ventilation of the building.

Setting back of buildings.

5. Any new building fronting a road shall, if the Commission so requires, be set back so far as the Commission considers necessary to provide adequate space for pedestrians using the pavement, for widening the roadway or both those purposes.

Floor space index.

6.(1) The floor space index within the City walls shall not exceed—

- (a) in Main Street, five to one;
- (b) elsewhere, four to one.

(2) Outside the City walls, the maximum floor space index shall be determined by the Commission, either for areas or for individual plots, having regard to the location thereof, the use to which they are to be put, the character of the area concerned, architectural design, development plan policy, and such other circumstances as appear to the Commission to be relevant.

Car space.

7.(1) Subject to the provisions of regulation 3(1), in the siting, arrangement and construction of any building mentioned in the Schedule, such provision shall be made for the accommodation of motor vehicles as is specified in the Schedule.

(2) For the purposes of the Schedule—

TOWN PLANNING (BUILDING DEVELOPMENT CONTROL) REGULATIONS 2001

Subsidiary
2001/026

- (a) one car space shall be not less than 4.9m long by 2.4m wide;
and
- (b) a fraction of a unit described in the Schedule shall be regarded
as one unit.

(3) The accommodation so provided shall not be taken into consideration
in calculating floor space index.

(4) The car parking requirement within the City walls shall be determined
by the Commission on the basis of the following:

- (a) pedestrianisation;
- (b) other traffic restrictive policy.

Revocation.

8. The Building (Development Control) Regulations are revoked.

1999-39

Town Planning

**TOWN PLANNING (BUILDING DEVELOPMENT CONTROL)
REGULATIONS 2001**
**Subsidiary
2001/026**
SCHEDULE

Regulation 7

ACCOMMODATION OF MOTOR VEHICLES

Car Space	Type of Building
1. Private residence –	
(a) House	Two car spaces for each house.
(b) Flats or apartments -	One car space for each residential unit.
2. Offices for any purposes	One car space for each unit of 180m ² of floor area.
3. Hotels	One car space for each unit of 5 bedrooms or each unit of 10 beds whichever is the less, excluding beds provided for hotel staff.
4. Industrial buildings, consisting of factories, stores, warehouses with or without office accommodation	Two car spaces and, if the floor exceeds 180m ² one additional car space for each unit of 180m ² of such excess.
5. Cinemas, theatres and concert halls	One car space for each unit of 25 seats.
6. Department stores, shops and showrooms, for stores (over 2,500m ²) the number of spaces will be judged on merit having regard to the nature and location of the development, accessibility by public transport and its likely traffic generation.	One car space for each unit of 180m ² of floor area.
7. Places of religious worship, art galleries,	(a) One car space for each unit of 180m ² of floor area;

TOWN PLANNING (BUILDING DEVELOPMENT CONTROL) REGULATIONS 2001

**Subsidiary
2001/026**

libraries, museums,
exhibition or meeting
halls, clubs, educational
establishments, nursing
homes, sports stadia,
swimming pools and
other like building

- (b) Such number of additional car spaces as appear to the Commission reasonably sufficient for the use of persons resorting to the building otherwise than for such purposes.

Gibraltar Development Plan Parts 1 and 2 2009

GIBRALTAR DEVELOPMENT PLAN

PARTS I & II

2009

Approved by the Chief Minister of Gibraltar, the Hon P R Caruana, QC, 25th September 2009.

Town Planning Division
Department of Enterprise and Development
Suite 631
Europort
Gibraltar

Gibraltar Neanderthals

Parts I & II

CONTENTS

SUMMARY OF POLICIES & PROPOSALS	I
PART I	1
1 INTRODUCTION	3
2 GENERAL DESIGN AND STANDARDS	9
3 THE ENVIRONMENT	25
4 HOUSING	41
5 EMPLOYMENT	49
6 TOURISM	53
7 RETAILING	57
8 TRANSPORT	61
9 SOCIAL AND COMMUNITY	69
10 LEISURE AND RECREATION	73
11 UTILITIES AND WASTE	79
PART II	87
12 ZONE 1 – THE OLD TOWN	89
13 ZONE 2 – BAYSIDE/WESTSIDE	91
14 ZONE 3 – PORT AND HARBOUR	99
15 ZONE 4 - EASTSIDE	103
16 ZONE 5 – NORTH FRONT	107
17 ZONE 6 – NORTH DISTRICT	111
18 ZONE 7 - EUROPA	115
19 ZONE 8 – SOUTH DISTRICT	121
20 ZONE 9 – UPPER ROCK	129
21 IMPLEMENTATION, MONITORING AND REVIEW	135
PROPOSALS MAPS	139

SUMMARY OF POLICIES & PROPOSALS

POLICY GDS1 – APPLICATIONS.....	10
POLICY GDS2 – DESIGN	11
POLICY GDS3 – PUBLIC REALM.....	12
POLICY GDS4 – LOSS OF OPEN SPACE	13
POLICY GDS5 – CREATION OF NEW OPEN SPACE.....	13
POLICY GDS6 – LANDSCAPE ASSESSMENT	13
POLICY GDS7 – PROTECTION OF STRATEGIC VISTAS	14
POLICY GDS8 – LANDSCAPING SCHEMES.....	14
POLICY GDS9 – ENERGY EFFICIENT DESIGN.....	15
POLICY GDS10 – REVIEW OF THE BUILDING REGULATIONS	16
POLICY GDS11 – MICRO-RENEWABLE ENERGY PROPOSALS	16
POLICY GDS12 – PRACTICAL EVALUATION OF MICRO-RENEWABLES.....	16
POLICY GDS13 – GOVERNMENT PROJECTS – ENERGY EFFICIENCY/MICRO RENEWABLE TECHNOLOGY	17
POLICY GDS14 – GREEN ROOFS.....	17
POLICY GDS15 – TALL BUILDINGS.....	18
POLICY GDS16 – DISABLED ACCESS	20
POLICY GDS17 – SHOPFRONTS	20
POLICY GDS18 – TIMBER WINDOWS AND SHUTTERS.....	22
POLICY GDS19 – ADVERTISING SIGNS	22
POLICY GDS20 – PROGRAMME OF ILLUMINATION SCHEMES	23
POLICY GDS21 – ILLUMINATION OF BUILDINGS.....	24
POLICY ENV1 – EFFECT ON THE ENVIRONMENT	25
POLICY ENV2 – ENVIRONMENTAL IMPACT ASSESSMENTS	26
POLICY ENV3 – SOIL	26
POLICY ENV4 – CONTAMINATED LAND.....	27
POLICY ENV5– LAND INSTABILITY	27
POLICY ENV6 – DEVELOPMENT AND FLOOD RISK	28
POLICY ENV7 – AIR AND WATER QUALITY.....	29

POLICY ENV8 – PROTECTION OF WATER QUALITY IN THE VICINITY OF SEA WATER INTAKES.....	30
POLICY ENV9 – NOISE	30
POLICY ENV10 – DUST NUISANCE	31
POLICY ENV11 – BIODIVERSITY	32
POLICY ENV12 – TREES.....	32
POLICY ENV13 – TREE PRESERVATION ORDERS.....	33
POLICY ENV14 – SITES OF ECOLOGICAL VALUE.....	33
POLICY ENV15 – SITES OF COMMUNITY IMPORTANCE/SPECIAL AREAS OF CONSERVATION.....	34
POLICY ENV16 – BATS AND SWIFTS.....	34
POLICY ENV17 – ENVIRONMENTAL IMPROVEMENT SCHEMES.....	35
POLICY ENV18 – DESIGNATION OF CONSERVATION AREAS.....	36
POLICY ENV19 – DEVELOPMENT WITHIN CONSERVATION AREAS	36
POLICY ENV20 – DESIGNATION OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES.	37
POLICY ENV21 – ALTERATIONS, EXTENSIONS AND CHANGE OF USE OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES.....	38
POLICY ENV22 – SETTING OF PROTECTED MONUMENTS, ETC.....	38
POLICY ENV23 – DEMOLITION OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES.	39
POLICY ENV24 – ARCHAEOLOGICAL SITES.....	40
POLICY H1 – HOME OWNERSHIP	42
POLICY H2 – HOUSING RANGE	43
POLICY H3 – HOUSING SCHEMES FOR THE ELDERLY	43
POLICY H4 – EFFECTIVE USE OF EXISTING RESIDENTIAL STOCK	44
POLICY H5 – CONVERSION OF RESIDENTIAL BUILDINGS.....	44
POLICY H6 – REDEVELOPMENT OF RESIDENTIAL ACCOMMODATION.....	45
POLICY H7 – INCREASES IN HEIGHT	46
POLICY H8 – DEVELOPMENT FOR THE ELDERLY - CAR PARKING STANDARDS.....	46
POLICY H9 – OFF-STREET CAR PARKING IN RESIDENTIAL ESTATES.....	47

POLICY E1 – ECONOMIC DEVELOPMENT 49

POLICY E2 – OFFICE DEVELOPMENT 50

POLICY E3 – LIGHT INDUSTRIAL AND STORAGE 51

POLICY E4 – RELOCATION OF INDUSTRIAL/STORAGE USES 51

POLICY E5 – NEW, REDEVELOPED OR EXTENDED INDUSTRIAL BUILDINGS 51

POLICY T1 – CARRYING CAPACITY..... 54

POLICY T2 – PROTECTION OF TOURIST ATTRACTIONS..... 55

POLICY T3 – MAJOR TOURIST DEVELOPMENT..... 55

POLICY T4 – HOTELS..... 56

POLICY T5 – TOURIST ACCOMMODATION 56

POLICY R1 – MAINTENANCE OF ROLE OF OLD TOWN 58

POLICY R2 – SUPERSTORES AND OTHER LARGE RETAIL OUTLETS..... 58

POLICY R3 – LOCAL SHOPPING CENTRES 59

POLICY R4 – TAKE AWAYS 59

POLICY R5 – RETAIL USES IN INDUSTRIAL ESTATES 60

POLICY TR1 – PROMOTION OF ALTERNATIVE MEANS OF TRANSPORT..... 62

POLICY TR2 – HIGHWAY CONSIDERATIONS..... 62

POLICY TR3 – CONSTRUCTION ACTIVITIES 63

POLICY TR4 – CAR PARKING 64

POLICY TR5 – PROVISION OF CAR PARKING FOR NEW DEVELOPMENT..... 64

POLICY TR6 – LOSS OF PUBLIC ON-STREET CAR PARKING..... 65

POLICY TR7 – PARKING PROPOSALS IN UNDERGROUND STRUCTURES 65

POLICY TR8 – PUBLIC PARKING PROVISION FOR DISABLED PERSONS..... 65

POLICY TR9 – PARKING PROVISION FOR DISABLED PERSONS IN NEW DEVELOPMENT 66

POLICY TR10 – CYCLING ROUTES 66

POLICY TR11 – CYCLE PARKING FACILITIES..... 67

POLICY TR12 – COACH PARK..... 67

POLICY TR13 – GIBRALTAR AIRPORT..... 68

POLICY S1 – SOCIAL AND COMMUNITY USES 70

POLICY LR1 – MAXIMISATION OF FACILITIES 73

POLICY LR2 – LEISURE AND RECREATIONAL FACILITIES IN NEW DEVELOPMENTS ...	74
POLICY LR3 – PROTECTION OF PARKS, ETC.	74
POLICY LR4 – SPORTING ORGANISATIONS PREMISES	75
POLICY LR5 – YOUTH FACILITIES	76
POLICY LR6 – PUBLIC BEACHES	76
POLICY LR7 – WATERFRONT ACCESS	77
POLICY LR8 – EXISTING WATERFRONT SITES WITHOUT PUBLIC ACCESS	78
POLICY UW1 – NEW UTILITY SERVICES.....	79
POLICY UW2 – WATER CONSERVATION.....	81
POLICY UW3 – TELECOMMUNICATION DEVELOPMENT	82
POLICY UW4 – RENEWABLE ENERGY SCHEMES	83
POLICY UW5 – CONSTRUCTION WASTE	84
POLICY UW6 – RECYCLING FACILITIES.....	84
POLICY UW7 – WASTE RECYCLING COLLECTION FACILITY.....	85
POLICY UW8 – REFUSE STORAGE.....	85
POLICY Z1.1 – THE OLD TOWN.....	89
POLICY Z2.1 – CAR PARK, BAYSIDE SPORTS COMPLEX.....	91
POLICY Z2.2 – MARINA BAY	91
POLICY Z2.3 – SOUTH OF ST ANNE’S.....	92
POLICY Z2.4 – NORTH MOLE INDUSTRIAL AREA	92
POLICY Z2.5 – EXISTING SITES OF DESALINATION PLANT/ GENERATING STATION	94
POLICY Z2.6 – MID-HARBOUR RECLAMATION.....	95
POLICY Z2.7 – NAVAL GROUNDS NO 1 AND 2 – REDEVELOPMENT.....	96
POLICY Z2.8 – QUEENSWAY QUAY.....	97
POLICY Z2.9 – GUN WHARF	97
POLICY Z2.10 – COALING ISLAND.....	98
POLICY Z3.1 – PORT USES	99
POLICY Z3.2 – POTENTIAL IMPACT ON NORTH MOLE ROAD.....	99
POLICY Z3.3 – DESALINATION PLANT – SAFEGUARDING.....	100
POLICY Z3.4 – PORT OPERATION REQUIREMENTS	100

GIBRALTAR DEVELOPMENT PLAN

POLICY Z3.5 – EXTENSION OF CRUISE TERMINAL 100

POLICY Z3.6 – SHIP REPAIR YARD 101

POLICY Z4.1 – THE EASTSIDE PROJECT 104

POLICY Z4.2 – EASTERN BEACH – ENVIRONMENTAL IMPROVEMENT 105

POLICY Z4.3 – EASTERN BEACH – COMMERCIAL DEVELOPMENT 105

POLICY Z4.4 – BOTH WORLDS CAR PARK 105

POLICY Z4.5 – THE WATER CATCHMENTS 106

POLICY Z5.1 – AIRPORT 107

POLICY Z5.2 – NEW AIRPORT/FRONTIER ACCESS ROAD 107

POLICY Z5.3 – SITE OF ROTUNDA SHOPPING CENTRE 108

POLICY Z5.4 – WESTERN BEACH 109

POLICY Z5.5 – THE AERIAL FARM 109

POLICY Z6.1 – DEVELOPMENT FRONTING DEVIL’S TOWER ROAD 112

POLICY Z6.2 – INDUSTRIAL/STORAGE USE 112

POLICY Z6.3 – ROAD IMPROVEMENT 112

POLICY Z6.4 – DEVIL’S TOWER ROAD CAR PARK 112

POLICY Z6.5 – EXTENSION TO CEMETERY 113

POLICY Z6.6– CEMETERY - ENVIRONMENTAL MANAGEMENT PLAN 113

POLICY Z7.1 – EUROPA POINT ENVIRONMENTAL IMPROVEMENT 116

POLICY Z7.2 – WASTE WATER TREATMENT WORKS 116

POLICY Z7.3 – EnERGY FROM WASTE FACILITY 117

POLICY Z7.4 – LATHBURY BARRACKS - INDUSTRIAL ESTATE 117

POLICY Z7.5 – LATHBURY BARRACKS GUARDROOM COMPLEX 117

POLICY Z7.6 – PROPOSALS AFFECTING HMP 118

POLICY Z7.7 – WINDMILL HILL ROAD 118

POLICY Z7.8 – LATHBURY – NATURAL LINKAGES 119

POLICY Z8.1 – ALAMEDA GARDENS 121

POLICY Z8.2 – PROPOSALS IN THE VICINITY OF ALAMEDA GARDENS 122

POLICY Z8.3 – GRAND PARADE 122

POLICY Z8.4 – ROSIA BAY	123
POLICY Z8.5 – ENVIRONMENTAL IMPROVEMENT FOR LITTLE BAY	123
POLICY Z8.6 – CAMP BAY/LITTLE BAY	123
POLICY Z8.7 – THE FORMER CASINO SITE, EUROPA ROAD	124
POLICY Z8.8 – MAIDA VALE.....	125
POLICY Z8.9 – KING GEORGE V HOSPITAL.....	125
POLICY Z8.10–NORTH GORGE.....	126
POLICY Z8.11 – THE MOUNT.....	126
POLICY Z8.12 – CONVERSION/REDEVELOPMENT OF THE FORMER ROYAL NAVAL HOSPITAL.....	127
POLICY Z9.1 – UPPER ROCK NATURE RESERVE BOUNDARY.....	130
POLICY Z9.2 – NON-RESIDENTIAL DEVELOPMENT IN THE UPPER ROCK NATURE RESERVE	130
POLICY Z9.3 – NEW DWELLINGS WITHIN THE NATURE RESERVE.....	131
POLICY Z9.4 – EXTENSIONS, ALTERATIONS OR IMPROVEMENTS TO DWELLINGS WITHIN THE NATURE RESERVE	132
POLICY Z9.5 – UTILITY DEVELOPMENT WITHIN THE NATURE RESERVE	133
POLICY Z9.6 – PROTECTION OF RIDGELINE.....	133
POLICY Z9.7 – DEVELOPMENT ADJACENT TO THE NATURE RESERVE.....	134

PART I

1 INTRODUCTION

General

- 1.0 This Development Plan is intended to guide land use planning in Gibraltar for the next ten years, although it is anticipated that it would be reviewed well before then and rolled forward.
- 1.1 The existing Development Plan for Gibraltar was published in 1991 and comprised three documents - a written statement containing general and area - specific policies and proposals; an Old Town Plan for the Old Town and a Design Guide for the Old Town. The Plan has served Gibraltar well in planning land uses, protecting the environment and, in particular, protecting the Old Town from inappropriate development. However, there is a need to bring the land use planning of Gibraltar up to date with the publication of a new Development Plan
- 1.2 As is to be expected, circumstances have changed since 1991. The 1991 Plan included provision for a reclamation project (referred to as Eurocity in that Plan) within the Northern part of the harbour. This reclamation has been completed and the land virtually fully developed. The growth of the Finance Centre has continued and is an important part of the Gibraltar economy creating demand for new office premises. Tourism has developed further and investor confidence has strengthened, resulting in various development projects coming forward or in the pipeline. The MOD downsizing has largely stabilised but consolidation of the MOD's land interests means that there is likely to be further land releases during the period of the new Plan. One of the largest MOD land releases was announced in spring 2004 with many of the areas of land being released on a phased basis over a number of years. Heritage and environmental issues have become increasingly prominent and the Government and the public alike wish to see these being taken into account in Gibraltar's future development.
- 1.3 This Plan takes into account these different competing demands on Gibraltar's scarce land resources and has created a co-ordinated set of policies and proposals to manage Gibraltar's future growth.
- 1.4 The nature of development in Gibraltar tends to be very opportunistic largely due to development frequently taking place on redevelopment sites and sites that become surplus to MOD requirements. By their very nature such sites are very difficult to identify as part of the plan process and therefore the Plan contains many criteria based policies that ensure that where such development is proposed its suitability is fully considered to ensure that Gibraltar benefits as a whole.

Status and Format of the Plan

- 1.5 This Development Plan constitutes a Planning Scheme as provided for by section 5 of the Town Planning Act 1999. It will be known as the 'Gibraltar Development Plan' and comprises:

- **Part I – general policies**
These policies apply throughout Gibraltar and set out planning policy in relation to a variety of topics.
- **Part II – area-specific policies and proposals**
Gibraltar has been divided into nine zones for land use planning purposes. Since the character and opportunities for each of these areas differs, specific policies and proposals have been formulated for each zone.
- **The Old Town Plan**
The Old Town is a zone as discussed above. However, the complexities of the issues involved in the Old Town are such that it is considered that a specific area plan is required that will provide detailed policy guidance and set out specific proposals for the zone. The significance of the zone requires that an area plan is produced at an early stage of the plan making process and hence it has been produced to come into effect simultaneously with the remainder of the Development Plan. In the future similar detailed plans may be prepared for other zones.
- **The Old Town Design Guide**
As discussed above the Old Town has a complex range of issues that need to be addressed, not least of which are design matters. This guide has therefore been produced to provide detailed policy guidance on this specific issue.

1.6 Proposal maps and plans are included and form part of the Plan. It should be noted that a number of the development plan zones extend into the sea. The sea boundaries to these zones have been drawn relatively close to the coastline for ease of presentation only. They are not intended to, nor do they, indicate the limit of planning controls in any manner or form, or to represent the extent of Gibraltar's waters.

1.7 The format of the Plan is intended to be flexible so as to allow easy future review of any part of the Plan. Whilst at this stage it is only the Old Town that has a specific area Plan it is anticipated that other areas shall have detailed plans prepared wherever it is considered necessary.

Use of the Plan

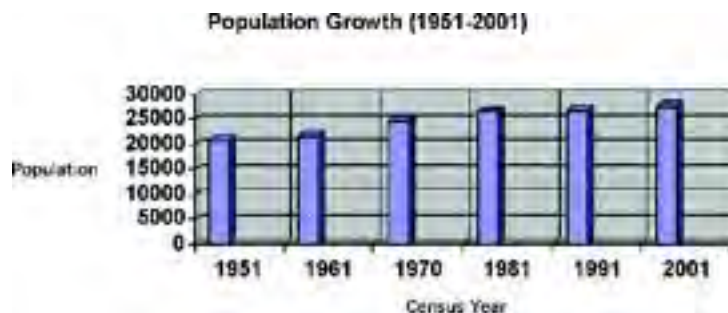
1.8 It is intended that this Plan should be used by developers, individuals, professional advisers, Government departments and agencies, voluntary organisations and interest groups. The purpose of the Plan is to provide a clear framework for the future planning of Gibraltar and to provide certainty in how development should take place in the future.

1.9 The Plan will therefore be an essential tool in development control and proposals will be expected to conform fully to the policies and proposals contained within it. As the Plan has been the subject of extensive public participation it must be seen as a plan that has the support of the community. Great weight will therefore be given to the contents of the Plan in determining applications and it is not expected that the policies and proposals contained within it shall be set aside without very significant reasons for doing so.

- 1.10 Users of the Plan should take careful note of the fact that THE POLICIES AND PROPOSALS CONTAINED IN THE PLAN ARE INTERRELATED. In considering the application of any policy or proposal to a particular proposed development it is important to remember that other policies or proposals may also be applicable and shall need to be complied with. The fact that a specific development proposal accords with one policy or proposal does not mean that this will take precedence if it conflicts with other policies and proposals of the Plan. To avoid duplication and in the interests of keeping the document concise, the requirement for any proposed development to be in accordance with all the Plan's policies and proposals is not repeated in the wording of each policy or proposal.

Context

- 1.11 Gibraltar's land area amounts to some 640 hectares but due to the topography of the Rock much of this is undevelopable. Much of the Upper Rock is designated as a Nature Reserve aimed at protecting its unique natural environment.
- 1.12 In terms of population, the latest population estimate for Gibraltar is some 29286¹. The population grew by some 27% between 1951 and 1981 but population growth since then has been very limited with only a 3.8% increase up to 2001¹. The graph below illustrates the trend in population growth.



- 1.13 Since 1961 the composition of the population has remained virtually constant with an even split between males and females. Life expectancy has been on the increase in the last two decades and in common with most developed societies the population is ageing.
- 1.14 Population forecasts are not produced for Gibraltar, however, based on past trends together with Gibraltar's geographical limitations it is not expected that there would be any dramatic changes in the local population during the next 10 years.
- 1.15 Gibraltar's economy has experienced significant structural change in the last half of the 20th century. Traditionally based on servicing the needs of the military the economy underwent significant changes in the 1980/1990s as a result of the scaling down of the military presence in Gibraltar. Economic diversification has resulted in finance, tourism and shipping being the mainstays of the economy.
- 1.16 The Government continues to promote economic diversification whilst strengthening those sectors that already form the mainstay of Gibraltar's economy.
- 1.17 Gibraltar has a rich heritage. The natural environment, both terrestrial and marine, boasts a wide variety of flora and fauna, many endemic to Gibraltar. European Environmental

¹ Census, 2001

protection legislation applies to Gibraltar and there are a number of European, as well as locally protected, species of flora and fauna. The Upper Rock Nature Reserve covers a land area of almost 200 hectares representing a significant proportion of Gibraltar's total land area.

- 1.18 Gibraltar's landscape is also of heritage value being a product of its geological development over millions of years. The interaction of humans with this landscape further contributes towards Gibraltar's unique heritage with evidence of occupation by pre-historic humans up to the present day. Further, Gibraltar's unique collection of well preserved fortifications and related naval and military sites is of international importance. Indeed Gibraltar's built environment is a reflection of its different periods of occupation and buildings and structures exist from the 8th century up to the present. Many of these buildings and structures are afforded legal protection under local legislation, as are archaeological remains.
- 1.19 This Plan aims to guide Gibraltar's future development for the next ten years and in so doing has taken into account Gibraltar's unique environment, population structure and economy. This is always a difficult balancing act and the strategy set out in the following section aims to achieve this balance by setting the strategic context for the detailed policies and proposals of the Plan that aim to encourage a stable population and economic prosperity whilst conserving those aspects of Gibraltar's environment and heritage that are most valuable.

Strategy

- 1.20 The timescale and statutory nature of the Gibraltar Development Plan make it a key document in the long-term development strategy for Gibraltar. As such the Development and Planning Commission will promote the use of the Plan as a means of assisting Government departments and agencies in the future planning of their own operations and activities.
- 1.21 In preparing this Plan consideration has been given to the many different and competing demands on Gibraltar's limited land area together with those aspects of Gibraltar that are considered of great value. A fine balancing act needs to be achieved that will allow for the future economic prosperity for Gibraltar without jeopardising those aspects of most value to Gibraltar. In seeking this balance the following strategic principles have been followed:

The following strategic principles have guided the preparation of this Plan:

Environment – to recognise the special character of Gibraltar's natural, built and cultural environment as a valuable resource and to ensure that this is not significantly adversely affected by new development.

Employment- to encourage and provide opportunities for the creation of new employment and the expansion of existing employment.

Population and housing – to ensure that Gibraltar's population remains stable and that sufficient housing opportunities to meet the different housing requirements and expectations of the community, are met.

Quality of life – to enhance the social, community, recreational and cultural facilities for the benefit of the local population and visitors.

Transport – to facilitate and encourage alternative means of transport including the use of public transport and to cater for the needs of private transport where appropriate.

Tourism – to ensure that tourist infrastructure and facilities are enhanced, and to ensure that the unique tourist attractions are protected and developed sensitively, so as to promote Gibraltar's attraction as a tourist destination.

Shopping – to ensure the provision of a quality shopping environment for the benefit of the local population and to further enhance Gibraltar's role as an important shopping centre in the wider area.

Strategic environmental assessment

- 1.22 Directive 2001/42/EC (the Strategic Environmental Assessment Directive) requires that certain types of plans and programmes be the subject of an assessment of their likely effect on the environment. The Directive's requirements came into effect on 21 July 2004.
- 1.23 With this in mind a Strategic Environmental Assessment (SEA) has been undertaken as part of the plan making process. This assessment has considered each policy against a range of environmental criteria to assess its potential impact from a global to a local scale.
- 1.24 This assessment allows the Development and Planning Commission to assess the sustainability of the Plan and to ensure that development takes place with the minimum impact on the environment.
- 1.25 The outcome of the SEA is contained in an Environmental Report that has been published in parallel with this Plan and which sets out how the SEA process has influenced the preparation of the Draft Plan.

EU Habitats Directive – Appropriate Assessment for Land Use Plans

- 1.26 The requirement for appropriate assessment of land use plans set out in the EU Habitats Directive (EC/92/43) has been transposed into local legislation under Part IIB of the Nature Protection Act. Section 17EE of the Act requires that the plan-making authority shall make an appropriate assessment of the implications of the Plan on any European site or European Marine site. In 2006 the European Commission accepted the two sites put forward by Gibraltar, the 'Rock of Gibraltar' and the 'Southern Waters of Gibraltar', as Sites of European importance
- 1.27 In light of the existence of two Sites of Community Importance a screening exercise was undertaken to assess the implications of the Consultation Draft Plan. The results of this exercise informed the plan-making process so as to minimise the potential for proposals to impact on the European sites. Where appropriate, detailed policies and proposals highlight the need for further assessment in the form of either, or both, Environmental Impact Assessment and Appropriate Assessments.

Precedence

- 1.28 This Plan sets out many policies relating to all aspects of development. It is recognised that throughout Gibraltar there will be many examples of development that currently exist and which do not accord with relevant policies contained in the Plan. Some of these may have been subject to the normal planning procedure whilst others may have taken place without permission.
- 1.29 The publication of this Plan marks a break from the past. The Plan sets out the Development and Planning Commission's current aspirations in terms of the future planning of Gibraltar regardless of what may have happened in the past. It is therefore important to understand that a line will be drawn under the past and that in future, development proposals will be assessed in the context of the policies and proposals contained in this Plan. The argument that development should be allowed merely because a precedent exists for it will not be accepted. To do so would imply that it would not be possible to improve on the status quo.

Data Collection and Forecasting

- 1.30 To be able to plan effectively it is important to have sufficient baseline data on which policies and proposals can be based. During the preparation of the Plan difficulties have been encountered in certain areas in collating data and in particular in forecasting future trends and projections whether for example this is in relation to population, housing demand or employment land demand. It is appropriate to highlight this issue as a matter that requires to be addressed so that steps can be taken to implement additional systems and procedures that will enable such data and forecasting to be used in future reviews of the Plan, and in the general long term planning of Gibraltar. The Development and Planning Commission will therefore work with relevant Government departments and agencies to review data collection and forecasting systems and to take the necessary steps to improve and refine these further.

2 GENERAL DESIGN AND STANDARDS

Introduction

- 2.0 Gibraltar's built and natural environment is unique and is what gives Gibraltar its own identity that is highly valued by its residents and is one of its attractions for tourists. The Development and Planning Commission therefore wants to ensure that this identity is not negatively affected by new development. This does not mean that there is an embargo on new development, but rather that any development that does take place must be designed so that it respects the character of the area and makes a positive contribution to the overall quality of the environment.
- 2.1 The Development and Planning Commission recognises the importance of design and the impact that buildings have on the character and appearance of an area. It is not only the buildings themselves that have an impact but also the treatment of spaces around them which is important in creating attractive, safe environments with their own identity and sense of place.

General design and standards

- 2.2 The Development and Planning Commission is keen to promote a high standard of design whether it is a new office block or a small extension - all development has an impact on the built environment. There is a need to shift away from bland and mediocre design to creating buildings of a high design standard. Good design benefits Gibraltar not only by creating an attractive environment in which to live and work, but also can have a positive effect on maintaining confidence and attracting further investment.
- 2.3 The protection and enhancement of Gibraltar's built heritage are important aspects of the Plan and are developed further through the section on the historic environment and the Old Town Plan. In addition, the Heritage Management Plan, currently being prepared by the Heritage Division, will provide further guidance on how the Government wishes to see the built heritage managed. The Development and Planning Commission therefore wishes to protect the best of our existing environment whilst allowing change to take place in a sensitive and constructive way. The policies of the Plan, the Old Town Plan and Design Guide are therefore aimed at ensuring that new development is of a high standard. Emphasis is placed on development proposals being designed sensitively with careful attention paid to the site's context.
- 2.4 The often poor quality of submissions received by the Development and Planning Commission through the planning process has been an indication of the lack of emphasis placed on good quality design in the past. The following policy therefore aims to improve the quality of submissions that will not only force applicants to take the matter of design more seriously, but will also assist the Development and Planning Commission in fully appreciating the nature and effect of the proposed development. This should enable the Development and Planning Commission to come to an early decision as it obviates the need for repeated requests for further information.

POLICY GDS1 - APPLICATIONS

APPLICATIONS FOR PLANNING PERMISSION WILL ONLY BE ACCEPTED WHERE THEY ARE ACCOMPANIED BY:

- A) A FULLY COMPLETED APPLICATION FORM;**
- B) A LOCATION PLAN AT 1: 1250 OUTLINING THE APPLICATION SITE;**
- C) AN EXISTING SITE PLAN TYPICALLY AT 1:200, SHOWING THE WHOLE PROPERTY INCLUDING ALL BUILDINGS, OPEN SPACES AND CAR PARKING, AND EXISTING TREES OR OTHER NATURAL FEATURES;**
- D) PROPOSED SITE LAYOUT TYPICALLY AT 1:200 SHOWING THE SITING OF ANY NEW BUILDING/EXTENSION, VEHICULAR/PEDESTRIAN ACCESS, CHANGES IN LEVELS, LANDSCAPE PROPOSALS INCLUDING TREES TO BE REMOVED, NEW OR ALTERED BOUNDARY WALLS, NEW HARD SURFACED OPEN SPACES;**
- E) APPROPRIATELY SCALED DRAWINGS, ELEVATIONS, FLOOR PLANS AND, IF RELEVANT, ROOF PLANS, SHOWING THE BUILDING AS EXISTING AND PROPOSED AND IN THE CONTEXT OF SURROUNDING BUILDINGS AND THE AREA;**
- F) APPROPRIATELY SCALED CROSS SECTIONS;**
- G) DETAILS OF PROPOSED MATERIALS AND COLOUR SCHEMES;**
- H) WHERE RELEVANT, DETAILS INCLUDING MAPS, INDICATING THE AREA OF ANY IMPORTANT FLORA AND FAUNA WITHIN THE APPLICATION SITE OR LIKELY TO BE AFFECTED BY THE PROPOSED DEVELOPMENT; AND**
- I) IN THE CASE OF MAJOR DEVELOPMENTS DESIGN STATEMENTS (TO EXPLAIN THE DESIGN PRINCIPLES AND DESIGN CONCEPT, AND TO EXPLAIN HOW THE DESIGN RELATES TO ITS WIDER CONTEXT) AND A STATEMENT ON ENERGY EFFICIENCY MEASURES PROPOSED;**

IN ADDITION, THE DEVELOPMENT AND PLANNING COMMISSION WELCOMES THE SUBMISSION, IN APPROPRIATE CASES, OF:

- I. PHOTOGRAPHIC MONTAGES;**
- II. PERSPECTIVES;**
- III. ARTISTIC IMPRESSIONS;**
- IV. COMPUTER GENERATED 3D IMAGES; AND**
- V. SCALE MODELS**

- 2.5 Good building design involves a well thought out design response to a variety of issues as set out in the preceding design policy. However, a well-designed building will also have included in the early design stage consideration of practical issues such as the various service requirements of the building. These include such matters as the siting of water

and electricity meters, sub station requirements (for larger developments), telephone infrastructure requirements, refuse storage and access issues, mail delivery services and gas storage. Early consultation with the relevant service provider is therefore important.

- 2.6 The following general design policy applies to all development proposals and will be used to assess the design aspects of any application. In considering applications therefore the Development and Planning Commission will need to be satisfied that the proposal is sensitive to its context, relates well to the character of the area, takes into account existing features and does not detrimentally affect the amenities of nearby occupiers to a significant level. The development will need to be accessible and landscaping will be required in appropriate cases.

POLICY GDS2 - DESIGN

THE DESIGN OF NEW DEVELOPMENT SHALL COMPLY WITH THE FOLLOWING CRITERIA:

- A) THE SCALE, MASSING AND HEIGHT MUST BE APPROPRIATE IN THE CONTEXT OF ADJACENT BUILDINGS, TOPOGRAPHY, THE GENERAL PATTERN OF DEVELOPMENT IN THE AREA, PUBLIC VIEWS, VISTAS AND LANDMARKS;***
- B) EFFECTIVELY RELATE TO THE CHARACTER, DENSITY, MIX AND FORM OF ADJACENT BUILDINGS AND SPACES, AND THE WIDER AREA;***
- C) TAKE INTO ACCOUNT, AND WHERE APPROPRIATE RETAIN, THE EXISTING FORM OF THE SITE AND FEATURES INCLUDING LANDSCAPE, SPECIES AND WILDLIFE HABITAT, BUILDINGS AND ARCHAEOLOGICAL, HISTORICAL AND CULTURAL FEATURES;***
- D) EFFECTIVELY INTEGRATE WITH THE LANDSCAPE AND RETAIN IMPORTANT VIEWS INTO AND OUT OF THE SITE, INCLUDING THE SKYLINE;***
- E) PROVIDE APPROPRIATE LANDSCAPING, BOTH HARD AND SOFT;***
- F) BE SYMPATHETIC IN MATERIALS AND DETAILING TO ADJACENT BUILDINGS AND THE WIDER AREA;***
- G) THERE MUST BE NO UNACCEPTABLE IMPACT ON LOCAL AMENITY IN TERMS OF VISUAL IMPACT, SIGNIFICANT LOSS OF PRIVACY, OVERLOOKING, DISTURBANCE, ODOURS AND TRAFFIC MOVEMENTS;***
- H) PROVIDE SATISFACTORY ACCESS; AND***
- I) WHERE APPROPRIATE, PROVIDE CAR PARKING TO THE SATISFACTION OF THE DEVELOPMENT AND PLANNING COMMISSION.***

The public realm

- 2.7 The public realm relates to those areas of Gibraltar, whether publicly or privately owned, that are available, without charge, for everyone to use or see, including streets, squares, parks and courtyards.

- 2.8 Well designed buildings can make a positive contribution to the public realm and can encourage people to stop and enjoy spaces rather than just pass through them. Poorly designed buildings can reduce the quality of the public realm by discouraging all but a narrow range of users and by creating an environment that is not conducive to its enjoyment by the public.
- 2.9 It is therefore important that buildings, spaces and routes, as well as surfaces (hard and soft), lighting and signage are well integrated so as to provide comfortable, attractive and secure places for people to use.

POLICY GDS3 – PUBLIC REALM

WHERE DEVELOPMENT IMPACTS ON THE PUBLIC REALM DESIGNS SHOULD ENSURE THOSE SCHEMES:

- A) **IMPROVE PEDESTRIAN LINKAGES BETWEEN THE MAIN SPACES AND ATTRACTIONS;**
- B) **THE LAYOUT FACILITATES SAFE AND CONVENIENT ACCESS AND MOVEMENT BY PEDESTRIANS, INCLUDING THOSE WITH PHYSICAL DISABILITIES AND MOBILITY DIFFICULTIES, AND CYCLISTS (WHERE APPROPRIATE), BOTH WITHIN THE DEVELOPMENT AND BETWEEN THE DEVELOPMENT AND THE SURROUNDING AREA;**
- C) **INTEGRATE WITH ADJACENT AREAS TO PRODUCE SPACES AND SEQUENCES THAT RESULT IN QUALITY TOWNSCAPE;**
- D) **LARGE DEVELOPMENTS SHOULD INCLUDE PUBLIC OPEN SPACE THAT IS DESIGNED TO ALLOW THE PENETRATION OF SUNLIGHT AND TO AVOID GENERATING EXCESSIVE WIND SPEEDS;**
- E) **ACTIVITY-GENERATING USES SHOULD BE INCLUDED ON THE GROUND FLOOR OF NEW DEVELOPMENTS, ESPECIALLY AT FOCAL POINTS OF PEDESTRIAN MOVEMENT; AND**
- F) **PROVIDE ATTRACTIVE DETAIL THROUGH THE USE OF MATERIALS, WELL-DESIGNED STREET FURNITURE AND LANDSCAPING.**

Open space

- 2.10 Throughout Gibraltar there are areas of open space of various size, form and character that are considered important for their contribution to the built environment. Such open spaces often have an important role to play in softening the appearance of built up areas, providing ‘lungs’ within the densely built up area and in providing settings to important buildings. Furthermore, open space often has an important role to play in enhancing the setting of the natural environment, providing a backdrop and generating vistas.

- 2.11 The Plan aims to protect these open spaces from development.

POLICY GDS4 – LOSS OF OPEN SPACE

THERE WILL BE A PRESUMPTION AGAINST THE LOSS OF OPEN SPACES THAT ARE CONSIDERED IMPORTANT IN TERMS OF THEIR:

- A) CONTRIBUTION TO THE CHARACTER AND APPEARANCE OF THE BUILT OR NATURAL ENVIRONMENT;*
- B) RECREATIONAL OR AMENITY VALUE;*
- C) ECOLOGICAL VALUE; AND/OR*
- D) HERITAGE VALUE.*

- 2.12 In order to assist in the implementation of the above policy it is proposed to produce supplementary planning guidance that will detail specific sites that will be subject to the above policy. An assessment of all open spaces will need to be undertaken that will consider such factors as nature conservation value, recreational and amenity value, landscape value and heritage value in determining the relative importance of these areas.
- 2.13 Until the above assessment has been undertaken and the supplementary planning guidance issued, proposals involving open spaces will be considered on their individual merits but with the above as guiding principles.
- 2.14 In addition to protecting existing open spaces the Development and Planning Commission will also actively encourage the creation of new open spaces, particularly 'green' areas. This may be achieved through the decision making process for permission for new developments, and in the case of public developments through the established consultation process.

POLICY GDS5 – CREATION OF NEW OPEN SPACE

WHERE APPROPRIATE, THE DEVELOPMENT AND PLANNING COMMISSION SHALL REQUIRE THAT NEW DEVELOPMENT INCORPORATES OPEN SPACES, PARTICULARLY 'GREEN AREAS'.

Landscape Character

- 2.15 It is recognised that new development has the potential to change the character of Gibraltar's landscape. Such development may have a long-term effect and can set a precedent for further development, changing the skyline and potentially affecting the strong visual relationship between, in particular, the Old Town and the waterfront. The Development and Planning Commission will take account of landscape character in considering planning applications and will, where it considers this necessary, request specific or general assessments to be carried out.

POLICY GDS6 – LANDSCAPE ASSESSMENT

IN CONSIDERING APPLICATIONS FOR DEVELOPMENT THE DEVELOPMENT AND PLANNING COMMISSION SHALL TAKE INTO ACCOUNT LANDSCAPE CHARACTER. IN APPROPRIATE CASES THE DEVELOPMENT AND PLANNING COMMISSION MAY REQUIRE THE SUBMISSION OF AN AREA-WIDE OR SITE-SPECIFIC DETAILED LANDSCAPE CHARACTER ASSESSMENT.

- 2.16 During the period of the Plan the Development and Planning Commission may from time to time identify strategically important vistas. Such vistas may be of landmark buildings, structures or landscape features which the Development and Planning Commission considers it is important to protect.

POLICY GDS7 – PROTECTION OF STRATEGIC VISTAS

PLANNING PERMISSION WILL NOT NORMALLY BE GRANTED FOR DEVELOPMENT THAT IMPINGES, TO A SIGNIFICANT DEGREE, ON ANY IDENTIFIED STRATEGIC VISTA.

Landscaping

- 2.17 Soft landscaping can make a significant contribution to the built environment by softening its appearance and can often be of ecological value. New development will normally be expected to incorporate proposals for an appropriate landscaping scheme as part of the application. A thorough assessment of the development site will identify natural features that may be incorporated into a landscaping scheme. Existing landscaping and trees may need to be retained or re-instated and supplemented by additional planting to achieve a more attractive environment. Landscaping schemes should indicate how they will be managed to ensure that it is properly maintained and that it does not die off and left in a state of neglect.
- 2.18 Hard landscaping is also an integral component of the built environment and in appropriate cases must be considered early in the design process to ensure that the proposed development is effectively integrated into the surrounding area.
- 2.19 Careful consideration should be given to the choice of plant species to be used in any soft landscaping scheme. Drought resistant species should be used wherever possible in order to minimise the need for watering thereby assisting in combating climate change, reducing energy and water consumption and increasing the chances of the long term success of the landscaping scheme.

POLICY GDS8 – LANDSCAPING SCHEMES

WHERE APPROPRIATE, PLANNING APPLICATIONS WILL BE EXPECTED TO BE ACCOMPANIED BY LANDSCAPING SCHEMES THAT MUST FORM AN INTEGRAL PART OF THE PROPOSAL. THESE WILL NORMALLY BE APPROVED PROVIDED:

- A) THE SCHEME TAKES ACCOUNT OF EXISTING NATURAL FEATURES, AND RESPECTS THE CHARACTER OF THE AREA;***
- B) DETAILS ARE PROVIDED OF HARD AND SOFT LANDSCAPING, NATURAL FEATURES AND THE RETENTION AND MANAGEMENT OF IMPORTANT TREES;***
- C) APPROPRIATE MEASURES ARE INCLUDED FOR RAINWATER COLLECTION AND/OR RE-USE OF POTABLE WATER FOR IRRIGATION PURPOSES;***

- D) NECESSARY PROVISION IS MADE FOR THE FUTURE MANAGEMENT AND MAINTENANCE OF THE SITE; AND**
- E) IT CAN BE DEMONSTRATED THAT DUE CONSIDERATION HAS BEEN GIVEN TO THE SELECTION OF DROUGHT RESISTANT PLANT SPECIES IN ANY SOFT LANDSCAPING SCHEME.**

Energy efficiency

- 2.20 In 2006 the Government published its Environmental Charter that sets out its approach to securing a sustainable and healthy environment. The Development Plan has an important role to play in securing some of the objectives set out in that Charter. Action needs to be taken now to combat global warming, no matter how small that action may appear to be.
- 2.21 Energy consumption and emission of greenhouse gases are significant contributory factors to global warming. Whilst clearly action is required at the global level the Government is nevertheless committed to take whatever action is possible to address these concerns. The Government is currently drafting an Energy Efficiency Action Plan that will ultimately form part of a wider Environmental Action and Management Plan. The Action Plan will provide detailed advice and guidance on energy efficiency. The policies of the Development Plan can also assist in the achievement of reducing energy consumption through appropriate land use planning.
- 2.22 Buildings are one of the main sources of CO₂ emissions and one of the Plan's policy objectives is to aim to improve the energy efficiency of buildings thereby contributing towards sustainable development through the reduction in the use of natural resources for power generation and reducing greenhouse gas emissions. Simple changes can help reduce energy requirements in buildings, for example careful choice of building materials, site layout (orientation, landscaping), through solar gain and improvements to the microclimate. In new developments such measures should be taken into consideration at an early stage of the design process.

POLICY GDS9 – ENERGY EFFICIENT DESIGN

THE DESIGN OF ANY PROPOSED DEVELOPMENT SHOULD TAKE APPROPRIATE ACCOUNT OF BUILDING DESIGN, SITING, ORIENTATION AND LAYOUT TO MAXIMISE ENERGY EFFICIENCY.

- 2.23 A further measure that can be taken to ensure improved energy efficiency of buildings is to raise construction standards. This can best be achieved through the introduction of more stringent regulations in relation to such matters as for example, standards of materials or insulation, in new development. The Development and Planning Commission shall therefore encourage a comprehensive review of the Building Regulations to be undertaken and subsequent periodic revision, with a view to ensuring continuous improvement in construction standards that will have a positive impact on energy efficiency of buildings.

POLICY GDS10 - REVIEW OF THE BUILDING REGULATIONS

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE A COMPREHENSIVE REVIEW OF THE BUILDING REGULATIONS TO BE UNDERTAKEN WITH SUBSEQUENT PERIODIC REVIEW, THAT SHALL TAKE ACCOUNT, IN PARTICULAR, OF THE NEED TO IMPROVE THE ENERGY EFFICIENCY OF BUILDINGS.

- 2.24 Micro-renewable energy generation is a further way of reducing greenhouse gas emissions by the generation of electricity using natural and sustainable resources on a small scale. Examples of such technologies include those that harness wind, solar or geothermal energy. The use of such micro-renewable technologies is to be welcomed although careful attention is required to minimise possible adverse effects such as visual impact and impact on nearby uses by, for example, noise generation.

POLICY GDS11 – MICRO-RENEWABLE ENERGY PROPOSALS

PROPOSALS FOR DEVELOPMENT INCORPORATING MICRO-RENEWABLE TECHNOLOGIES WILL BE ENCOURAGED SUBJECT TO ENSURING THAT THE PROPOSED DEVELOPMENT HAS NO:

- A) SIGNIFICANT ADVERSE VISUAL IMPACT; OR*
- B) SIGNIFICANT ADVERSE IMPACT ON THE CHARACTER OF THE AREA; OR*
- C) SIGNIFICANT ADVERSE IMPACT ON NEARBY USES.*

- 2.25 It is recognised that there may be practical difficulties in the use of micro-renewable technologies. For example, in the case of an individual using such technology to generate electricity through say the use of photovoltaic cells, it would be desirable for that person to be able to feed any surplus electricity into the main electricity grid. Conversely, when that same individual requires additional electricity this could be acquired from the grid. The Electricity Authority would have to assess the practicalities of how this could be achieved together with how the purchasing/selling of electricity would be achieved. There is therefore a need for the relevant Government departments or agencies/authorities to assess the practical issues in accommodating small-scale micro-renewable technologies and to advise interested parties accordingly.

POLICY GDS12 – PRACTICAL EVALUATION OF MICRO-RENEWABLES

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE THOSE GOVERNMENT DEPARTMENTS, AGENCIES OR AUTHORITIES THAT WOULD BE INVOLVED IN THE PRACTICALITIES OF MICRO RENEWABLE TECHNOLOGIES TO INVESTIGATE HOW BEST TO ACCOMMODATE THESE.

2.26 The Government is well placed to promote the development of energy efficient buildings as well as the use of micro renewable technology, through its wide programme of development projects and infrastructure works. Thus for example, new development projects for schools, car parks and other public buildings should ideally be required to demonstrate the incorporation of energy efficient measures. The provision of new or upgraded infrastructure, such as street lighting, illumination of buildings or pumping stations all offer the opportunity for the use of micro-renewable technology. The Development and Planning Commission shall therefore encourage the Government to consider energy efficient measures and the use of micro-renewable energy technology within public development and infrastructure projects.

POLICY GDS13 – GOVERNMENT PROJECTS – ENERGY EFFICIENCY/MICRO RENEWABLE TECHNOLOGY

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE THE GOVERNMENT TO GIVE DUE CONSIDERATION TO THE USE OF ENERGY EFFICIENT MEASURES AND/OR THE USE OF MICRO-RENEWABLE TECHNOLOGIES IN PUBLIC DEVELOPMENT AND INFRASTRUCTURE PROJECTS

Green Roofs

2.27 The Development and Planning Commission recognises that in appropriate cases the introduction of green roofs can be of social, environmental and economic benefit. Green roofs can reduce operational costs through energy efficiency and provide new sources of amenity and recreational space. They also contribute towards a healthier environment. In appropriate cases therefore the Development and Planning Commission will welcome proposals to incorporate green roofs into development proposals. Green roofs will be of particular relevance in developments that are situated in close proximity to natural areas, in particular the Upper Rock, and where they will serve to minimise the visual impact of proposed development as well as help maintain the ecological value of the area.

2.28 In order to minimise water and energy consumption careful attention is required to the choice of plant species for inclusion in any ‘green roofs’. Drought resistant species should be selected to minimise watering requirements and to ensure survival during drought conditions.

POLICY GDS14 – GREEN ROOFS

WHERE APPROPRIATE, THE INCORPORATION OF GREEN ROOFS INTO DEVELOPMENT PROPOSALS WILL BE ENCOURAGED.

Tall Buildings

- 2.29 Tall buildings, suitably located and designed, can make a positive contribution to the urban environment. They affect the image and identity of an area as a whole, often serving as beacons of regeneration stimulating further investment. Tall buildings represent high-density development and thus can be seen to contribute, in a general sense, to sustainability principles. However, by virtue of their size and prominence such buildings can also harm the qualities that people value about a place. There is a need for such proposals to be carefully scrutinised and to balance up the positive and negative effects of such proposals.
- 2.30 Gibraltar's limited geographical area, and overall scale, means that tall building proposals can easily have a major impact on the local landscape. Even within Gibraltar's limited area, there are significant variations in the character of the landscape with consequent differences in the ability of local landscape to absorb such proposals.
- 2.31 As a general rule it is not considered useful to define rigorously what is and what is not a tall building. This will clearly depend on the particular circumstances of the context into which the building is to be placed. However, an exception has been made in the case of the Old Town where the Old Town Plan includes a specific policy on tall buildings that identifies these as being of 5 or more storeys. In this case it was considered appropriate to define tall buildings in the context of the general scale and height of buildings throughout the Old Town and the relative sensitivity of the townscape to the introduction of tall buildings.
- 2.32 As explained above tall buildings can have a major impact on the landscape and the Development and Planning Commission therefore expects applicants to provide a comprehensive design statement in support of any application. Applicants should also note that even where an outline application is submitted, the Development and Planning Commission shall require the proposal to be submitted in sufficient detail to enable a full assessment to be undertaken.
- 2.33 In considering such proposals, particular attention will be given to the relationship of the proposed development to its context, the effect on the whole environment (e.g. impact on historic building sites, landscapes and skyline), architectural quality, sustainable design and construction, contribution to public spaces and facilities, effect on local climate (microclimate) and provision of high quality environment.
- 2.34 In addition to the above considerations, tall buildings may also have implications on the safe operation of Gibraltar Airport. Section 8 provides further details.
- 2.35 The potential impact of tall building proposals on Gibraltar's landscape is of such significance that in addition to obtaining the Development and Planning Commission's permission the approval of the Government shall also be required.

POLICY GDS15 – TALL BUILDINGS

ALL APPLICATIONS FOR TALL BUILDINGS SHALL NEED TO BE ACCOMPANIED BY A COMPREHENSIVE DESIGN STATEMENT. IN CONSIDERING SUCH PROPOSALS CONSIDERATION SHALL BE GIVEN IN PARTICULAR TO:

- A) *THE RELATIONSHIP TO CONTEXT, E.G. NATURAL TOPOGRAPHY, SCALE, HEIGHT, BUILT FORM, STREETScape, ETC;*
- B) *ARCHITECTURAL QUALITY, E.G. SCALE, MASSING SILHOUETTE, MATERIALS, ETC;*
- C) *SUSTAINABLE DESIGN AND CONSTRUCTION;*
- D) *CONTRIBUTION TO PUBLIC SPACES AND FACILITIES PARTICULARLY THE CONTRIBUTION TO THE PROVISION OF A MIX OF USES AT GROUND FLOOR LEVEL AND THE CREATION OF HIGH QUALITY PUBLIC REALM;*
- E) *EFFECT ON LOCAL ENVIRONMENT – MICROCLIMATE, OVERSHADOWING, ETC;*
- F) *PROVISION OF HIGH QUALITY ENVIRONMENT; AND*
- G) *AIRFIELD SAFETY REQUIREMENTS.*

IN ADDITION TO PLANNING PERMISSION TALL BUILDING PROPOSALS WILL ALSO REQUIRE THE APPROVAL OF THE GOVERNMENT.

Accessibility

- 2.36 People with disabilities, mobility problems and people with young children in pushchairs, often have difficulty in accessing buildings. The Development and Planning Commission wishes to minimise the physical barriers to movement for such people and expects that their needs will be taken into account in the design of new buildings, alterations or changes of use. The following policy applies to buildings that are open to the public (such as shops, restaurants, hotels, banks, commercial premises, places of entertainment, leisure and community buildings), places of employment, education buildings and dwellings.
- 2.37 Some flexibility may be required in the implementation of the policy in relation to listed and other historic buildings to ensure that their character and appearance is respected, and also where the physical limitation of the site makes it impossible to provide such access.
- 2.38 As indicated earlier in this section the Development and Planning Commission is to encourage a review of the existing Building Regulations. Any such review will need to include consideration of the issue of access for people with mobility difficulties and once the revised regulations are implemented proposed development will need to be in full compliance.
- 2.39 It should also be noted that the Disabled Persons Act 1992, makes specific provision for “Access to and facilities at premises open to the public”. It should be further noted that the Equal Opportunities Act 2006 prohibits discrimination on the grounds of disability and that in certain circumstances this may require ‘reasonable adjustments to be made to premises (including access to the premises). The Act also includes provisions the effect of which is to require lessors not to unreasonably withhold their consent to an occupier making ‘reasonable adjustments’ to the premises.

POLICY GDS16 – DISABLED ACCESS

PROPOSALS FOR NEW DEVELOPMENT, ALTERATIONS OR CHANGES OF USE OF EXISTING BUILDINGS WILL BE REQUIRED TO PROVIDE SATISFACTORY ACCESS FOR PEOPLE WITH DISABILITIES, MOBILITY PROBLEMS OR PEOPLE WITH YOUNG CHILDREN IN PUSHCHAIRS AS CUSTOMERS, VISITORS, EMPLOYEES AND RESIDENTS.

Shopfronts

- 2.40 Shopfronts are an important feature of the streetscene and can provide interest for shoppers and the general public alike. Through sensitive design shopfronts, signs and associated features can significantly enhance the shopping environment. Conversely, poorly designed shopfronts can have a negative effect on that same environment. Shopfronts are an important part of the public realm and can add interest and vibrancy to the area. Shopfront design must therefore take this into account and proposals that work counter to this, such as the introduction of dead frontages through, for example, solid shuttering will not be permitted.
- 2.41 Over recent years there has been a tendency for standardised designs to be introduced, the extensive use of inappropriate materials and signage, all of which detract from the quality of the shopping environment. In future, more attention shall be given to ensuring that shopfront design respects the character of the building in which it is situated and the area generally, and to avoiding intrusive signage and detailing. This does not preclude good contemporary design where appropriate.
- 2.42 The Old Town Plan and Design Guide provide more detailed guidance on shopfronts in the town area, but the following policy applies to all such development:

POLICY GDS17 - SHOPFRONTS

PROPOSALS FOR NEW SHOPFRONTS OR THE REFURBISHMENT OF EXISTING SHOPFRONTS WILL ONLY BE PERMITTED WHERE:

- A) THEY ARE SYMPATHETIC TO THE CHARACTER OF THE BUILDING, ADJACENT PROPERTIES AND THE SURROUNDING AREA;*
- B) THE SCALE AND PROPORTION ARE APPROPRIATE TO THE LOCALITY;*
- C) THEY DO NOT RESULT IN THE LOSS OF A TRADITIONAL SHOPFRONT;*
- D) THE DETAILING, COLOUR AND MATERIAL ARE APPROPRIATE TO THE AREA;*
- E) ANY PROPOSED AWNINGS ARE OF A SYMPATHETIC DESIGN, COLOUR AND MATERIAL;*

- F) THE FASCIA AND SIGNAGE ARE APPROPRIATELY POSITIONED AND LOCATED, AND, WHERE RELEVANT, APPROPRIATELY ILLUMINATED, WITH RESPECT TO THE LOCALITY; AND*
- G) SECURITY SHUTTERS, IF CONSIDERED ESSENTIAL, ARE NOT VISUALLY INTRUSIVE AND ARE FULLY PERFORATED TO ENABLE A CLEAR VIEW OF THE INTERIOR WHEN CLOSED.*

2.43 The above policy equally applies to premises located in shopping areas but may not be classified as shops, such as banks, building societies, commercial premises, etc.

Timber windows and Shutters

2.44 Buildings in Gibraltar have traditionally incorporated timber framed windows and timber shutters, the former being either vertical sliding sash or casements, whilst the latter have been side hung with viewing hatches on the lower half of each shutter.

2.45 Windows are an important feature in the elevation of any building and their replacement by unsympathetic designs can have a detrimental impact on the historic and architectural character of the building. The predominance of these features in Gibraltar's architecture means that their loss has a wider impact than just on the building itself. The streetscape and townscape can be affected by the loss of these features.

2.46 Over the years many buildings have had their timber windows and/or shutters replaced with modern alternatives such as upvc or aluminium. The Development and Planning Commission's preference is for existing timber windows and shutters to be repaired rather than replaced, however in some cases this is not feasible and replacement is the only option. In such cases, the preference will be for replacements to be of timber construction. However, where a building has already undergone significant change with the majority of the traditional windows and shutters already lost to alternatives, and provided that the building is not a statutorily protected building nor is it situated within a Conservation Area, then the Development and Planning Commission may permit the replacement of any remaining timber windows and shutters with non-timber alternatives.

2.47 The Government operates at present a scheme for 'Tax Relief On Façade Improvements' as a means of achieving improvements to the physical environment. The cost of replacement of windows and shutters is an eligible expense under the scheme and as an incentive to owners, applications involving replacement with timber windows and shutters will normally be approved. Conversely, replacements with non-timber windows and shutters will not normally be approved for tax relief.

2.48 It should be noted that where the building is a statutorily protected building or within a Conservation Area the relevant policies are set out in the Environment section of this Part of the Plan.

POLICY GDS18 - TIMBER WINDOWS AND SHUTTERS

PERMISSION FOR THE REPLACEMENT OF EXISTING TIMBER WINDOWS OR SHUTTERS BY NON-TIMBER REPLACEMENTS WILL ONLY BE GRANTED WHERE:

- A) THE BUILDING IS NOT A STATUTORILY PROTECTED BUILDING, AND/OR,**
- B) THE BUILDING IS NOT LOCATED WITHIN A CONSERVATION AREA; AND**
- C) THE MAJORITY OF THE BUILDING'S EXISTING WINDOWS (IN THE CASE OF WINDOW REPLACEMENT) OR SHUTTERS (IN THE CASE OF SHUTTER REPLACEMENT) ARE NOT OF TIMBER CONSTRUCTION.**

Advertisements

- 2.49 All advertising signs require consent under the Town Planning Act. The proliferation of signs can result in a cluttered and untidy appearance to the detriment of the streetscene. Care needs to be taken to ensure that signage does not appear to be out of scale, obtrusive or unsympathetic to the architectural qualities of the building or the area generally. Applications will be assessed in terms of visual amenity and public safety. Signs that could cause an obstruction or danger to either pedestrians or vehicles will not normally be permitted. Even in pedestrianised areas signs will not be permitted that could cause an obstruction to vehicles. This is because whilst the area may be pedestrianised, service vehicles and emergency vehicles still require unrestricted access, and special events may also necessitate the unrestricted passage of vehicles.
- 2.50 The illumination of signs can have a significant impact on the appearance of the shopfront, the building on which it is located and the area generally. High intensity illumination will not normally be permitted as it is not considered appropriate due to its obtrusive nature and potential disturbance to nearby occupiers. Similarly, intermittent lighting sources will not normally be permitted. Where shopfronts are to be illuminated through the use of external light sources, these should be discrete in appearance and limited in number.
- 2.51 Existing signs poorly designed or positioned on the building, or in the vicinity, will not be regarded as justification for further similar signs.
- 2.52 The following general policy applies to all advertising sign proposals, but in addition, further detailed advice is provided for the Old Town area in the Old Town Plan and the Design Guide.

POLICY GDS19 – ADVERTISING SIGNS

APPLICATIONS FOR ADVERTISING SIGNS WILL ONLY BE GRANTED WHERE THEY:

- A) ARE APPROPRIATE TO THEIR SURROUNDINGS IN TERMS OF SCALE, COLOUR AND MATERIALS USED;**

- B) RESPECT THE ARCHITECTURAL QUALITIES OF ANY BUILDING ON WHICH THEY ARE LOCATED;**
- C) ARE APPROPRIATE TO THE LOCATION IN TERMS OF THE METHOD OF DISPLAY, SUPPORT, AND THE TYPE AND INTENSITY OF ANY ILLUMINATION; AND**
- D) ARE ACCEPTABLE IN TERMS OF SAFETY TO BOTH PEDESTRIANS AND VEHICULAR TRAFFIC.**

Illumination of buildings and features

2.53 The illumination of buildings can have a dramatic impact on the night time environment and it is therefore important that the illumination of buildings is carefully controlled to ensure that the impact is a positive one. Such illumination is normally restricted to important public buildings, historic buildings and monuments, natural features and buildings of architectural importance.

2.54 A number of illumination schemes already exist including the floodlighting of the North face of the Rock, the Tower of Homage, parts of the City Walls and a number of other public buildings. The Development and Planning Commission is keen to extend such schemes so that other important buildings, monuments and features can be illuminated at night, which it considers makes a positive contribution to Gibraltar's night time environment. It shall therefore encourage the Government to continue to keep its programme of illumination schemes under review.

POLICY GDS20 – PROGRAMME OF ILLUMINATION SCHEMES

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE THE GOVERNMENT TO KEEP UNDER REVIEW ITS PROGRAMME FOR ILLUMINATION SCHEMES.

2.55 Proposals for illumination schemes for private buildings may come forward from time to time. Such proposals will be considered on their merits but the Development and Planning Commission will want to be satisfied that the building merits illumination, that the scheme is sensitive to the building and its surroundings, and that the proposed illumination intensity is the minimum required and will not result in unacceptable disturbance to adjacent occupiers. Furthermore, the Development and Planning Commission will seek to ensure that appropriate consideration has been given to energy efficiency and renewable energy sources as detailed below.

2.56 Whilst the Development and Planning Commission is keen to encourage appropriate illumination schemes, it is also conscious of the implications of such schemes on energy consumption. It will therefore encourage the proper consideration of the use of energy efficient measures and renewable energy sources where possible, in the design of illumination schemes.

POLICY GDS21 – ILLUMINATION OF BUILDINGS

PROPOSALS FOR THE ILLUMINATION OF BUILDINGS WILL NORMALLY BE FAVOURABLY CONSIDERED PROVIDED THAT:

- A) THE BUILDING THE SUBJECT OF THE PROPOSAL, MERITS ILLUMINATION BY VIRTUE OF ITS ARCHITECTURAL OR HISTORIC VALUE;**
- B) THE PROPOSED ILLUMINATION SCHEME IS SENSITIVE TO THE CHARACTER AND APPEARANCE OF THE BUILDING AND SURROUNDING AREA;**
- C) THE LEVEL OF ILLUMINATION IS THE MINIMUM REQUIRED AND THAT THERE WILL BE NO UNACCEPTABLE DISTURBANCE TO ADJACENT OCCUPIERS; AND**
- D) THE APPLICANT CAN DEMONSTRATE THAT PROPER CONSIDERATION HAS BEEN GIVEN TO THE USE OF ENERGY EFFICIENT MEASURES AND/ OR USE OF RENEWABLE ENERGY SOURCES.**

Enforcement

2.57 This Plan is intended to guide future development and consequently sets out the Development and Planning Commission's policy in respect of a broad spectrum of planning -related issues. The implementation of many of these policies will largely be achieved through the planning application system. It is therefore self-evident that where unauthorised development takes place the opportunity to implement the Plan's policies, and therefore its holistic objectives, is lost. This fact taken together with the illegality of unauthorised works, means that the Development and Planning Commission adopts a zero tolerance policy to such unauthorised works and will use all powers available to it under the Town Planning Act to tackle any such cases.

3 THE ENVIRONMENT

Introduction

- 3.0 One of the most important objectives of the planning system is to maintain the quality of the environment - to improve and preserve the quality of the natural environment, protect important wildlife habitats and to conserve our architectural and cultural heritage. This is one of the strategic principles underlying the preparation of this Plan and the Development and Planning Commission places great emphasis on it.
- 3.1 Whilst Gibraltar comprises only some 640 ha of land together with its coastal waters it nevertheless contains significant areas of environmental importance, such as the Upper Rock, yet also has a very densely populated urban area and a huge daily influx of visitors across the land frontier, which in 2008 averaged almost 26,500 people per day¹.
- 3.2 There is therefore a delicate balance to be struck in accommodating the requirement for development whilst preserving the environment.
- 3.3 Specific policies to protect the Upper Rock and to enhance the environment of certain areas e.g. The Old Town, are included elsewhere within the Plan in the section relating to the relevant zone. There is however, a need for a general policy on environmental matters that applies to the whole of Gibraltar.

POLICY ENV1 – EFFECT ON THE ENVIRONMENT

THE EFFECT ON THE ENVIRONMENT OF DEVELOPMENT PROPOSALS SHALL BE A PRIME CONSIDERATION IN DETERMINING APPLICATIONS.

- 3.4 The remainder of this section sets out general environmental policies under specified headings. However, it should be borne in mind that there are also general policies contained in the chapter on General Design and Standards that may be of relevance in considering environmental factors.

Environmental Impact Assessments

- 3.5 Environmental Impact Assessment (EIA) provides a structured assessment of the environmental effects of a proposed development on the environment, and helps to ensure that any impacts can be avoided or adequate mitigation measures and/or compensation measures are introduced. The Environmental Impact Assessment Regulations 2000 provide the legislative framework for EIAs and prospective developers should ensure that they comply fully with the Regulations.
- 3.6 There are a number of benefits to EIAs including:
- a) The provision of more details about major projects and their environmental consequences. This enables the Development and Planning Commission to fully consider the environmental effects in their decision making process.

¹ Derived from Tourist Survey, 2008

- b) The provision of detailed information on the environmental consequences is released into the public domain early in the planning process. This allows for full public involvement in the decision making process.
 - c) Developers must consider the environmental consequences of their proposal at the beginning of the project design process.
 - d) Environmental mitigation measures are introduced at the design stage of major projects
- 3.7 An EIA will be required where there are likely to be significant impacts on the environment. The Regulations provide more detail on the matter. The cost of preparing an Environmental Impact Assessment falls on the applicant and it should be carried out as early as possible in the design process.

POLICY ENV2 – ENVIRONMENTAL IMPACT ASSESSMENTS

APPLICATIONS FOR DEVELOPMENT PROPOSALS THAT ARE LIKELY TO HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT BY VIRTUE OF THE NATURE OF THE PROPOSED DEVELOPMENT AND ITS PROPOSED LOCATION, MUST BE ACCOMPANIED BY AN ENVIRONMENTAL IMPACT ASSESSMENT.

Soil

- 3.8 Soil is a very scarce resource and it is therefore important to ensure it is properly managed. Gibraltar's unique circumstances mean that the main concern in relation to soil is its loss as opposed to its degradation. In this context wherever development involves the removal of significant amounts of soil every effort should be made to find a beneficial use for the removed soil. One of the most obvious uses for such soil is in landscaping schemes either related to the development or for general landscaping purposes. Applicants will be expected, in appropriate cases, to demonstrate that they have given serious consideration to the re-use of soil removed from the development site.

POLICY ENV3 - SOIL

WHERE RELEVANT, APPLICANTS WILL BE EXPECTED TO MAKE PROVISION FOR THE BENEFICIAL RE-USE OF SOIL REMOVED FROM THE SITE.

Contaminated Land

- 3.9 Contamination of land can occur through natural processes but is more commonly associated with previous uses or operations that have taken place on the land. Examples of potentially contaminated sites include land that has been used for industrial processes such as ship repair, where hazardous substances may have been used, or possibly land used for military purposes where hazardous substances or materials, or munitions may have been widely used.

- 3.10 The re-use of contaminated land is in line with sustainability principles as it effectively recycles land and minimises the need to utilise previously undeveloped land or to create new land through reclamation from the sea. Land is one of Gibraltar's scarcest resources and there is therefore a need to ensure that maximum use is made of the existing land stock. However, a balance needs to be struck between the desire to bring land back into beneficial use and the risks that contaminated land can represent to human health, property and the wider environment. The real or perceived costs of treatment of contaminated land may sometimes act as a barrier to successful development but where the contamination issues and their solutions are identified and integrated into the scheme at an early stage of the development process these concerns can be minimised.

POLICY ENV4 - CONTAMINATED LAND

PLANNING PERMISSION FOR DEVELOPMENT ON CONTAMINATED LAND WILL NORMALLY BE GRANTED PROVIDED THAT IT CAN BE DEMONSTRATED THAT MEASURES CAN BE TAKEN TO SATISFACTORILY OVERCOME ANY SIGNIFICANT RISK TO LIFE, HEALTH OR PROPERTY.

Land Instability

- 3.11 The geomorphology of Gibraltar is such that there are many exposed cliff faces, some of which can be of significant height. Rock falls and landslips from such cliff faces can occur and in considering new development proposals it is important to ensure that the proposal is not exposed to, or does not create, unacceptable risks from land instability.
- 3.12 The onus is on the applicant to demonstrate that the proposed development does not create, or is not exposed to unacceptable risks, and this will frequently necessitate the undertaking of a geo-technical engineering survey that will need to be submitted for consideration. The Government may subject any such survey to independent review, the cost of which will need to be met by the applicant. Any mitigation measures proposed as a result of such a survey will need to be carefully considered in the context of their effect on the ecology of the area and their visual impact.

POLICY ENV5 – LAND INSTABILITY

PLANNING PERMISSION WILL NOT BE GRANTED WHERE:

- A) THERE WOULD BE AN UNACCEPTABLE RISK TO LIFE OR PROPERTY ARISING FROM THE INSTABILITY OF THE PROPOSED SITE, OR OF ANY NEARBY LAND; OR***
- B) THE PROPOSED DEVELOPMENT ITSELF WOULD CREATE UNSTABLE GROUND CONDITIONS WHICH WOULD PRESENT AN UNACCEPTABLE RISK TO LIFE OR PROPERTY ON THE SITE OR IN ITS VICINITY.***

WHERE IT IS CONSIDERED THAT THERE IS A RISK OF INSTABILITY THE APPLICANT WILL BE REQUIRED TO ENGAGE A REPUTABLE GEOTECHNICAL ENGINEERING CONSULTANT TO UNDERTAKE A RISK ASSESSMENT AND PROVIDE ADVICE ON ANY WORKS THAT MAY BE CONSIDERED NECESSARY. THIS ASSESSMENT MAY BE SUBJECTED TO AN INDEPENDENT DESIGN REVIEW BY THE RELEVANT GOVERNMENT DEPARTMENT. ANY PROPOSED REMEDIAL WORKS WOULD NEED TO ENSURE THAT THERE IS NO SIGNIFICANT ADVERSE EFFECT ON THE ENVIRONMENT.

Development and flood risk

- 3.13 The low-lying nature of many parts of Gibraltar means that there is potential for inundation by the sea. Much of Gibraltar's low-lying land is situated within the protected harbour area and although specific areas within the harbour may be susceptible to large swells, this area is generally considered at low risk. The more exposed areas of Gibraltar's shoreline, particularly the southern and eastern sides that do not benefit from the relative protection of the Bay of Gibraltar, are considered to be at greater risk.
- 3.14 It is commonly accepted that sea levels are likely to rise in the future as a result of global warming. The scientific community continues to debate the extent of such rises with predictions currently ranging from less than a metre to a few metres. Clearly proper consideration must be given to the impact of likely sea level rise and its resultant impact on areas likely to be at risk of inundation.
- 3.15 Where development is proposed in areas considered to be at risk, the applicant will need to demonstrate how the proposed development shall be protected from inundation. Consideration will need to be given to the environmental effect of any coastal defence works that are required, including possible secondary effects elsewhere along the coast. As already indicated predictions for future sea level rise do vary but a mid range prediction would be in the order of 5mm per year. This should be considered a minimum and may well vary with time as predictions are reviewed.

POLICY ENV6 – DEVELOPMENT AND FLOOD RISK

PLANNING PERMISSION FOR DEVELOPMENT IN AREAS CONSIDERED TO BE AT RISK WILL ONLY BE GRANTED WHERE THE APPLICANT CAN DEMONSTRATE THAT THE PROPOSED DEVELOPMENT WILL BE ADEQUATELY PROTECTED FROM INUNDATION. ANY PROTECTIVE MEASURES REQUIRED MUST NOT HAVE AN UNACCEPTABLE EFFECT ON THE ENVIRONMENT, INCLUDING POSSIBLE SECONDARY EFFECTS ELSEWHERE ON THE COASTLINE ARISING FROM THE PROPOSED PROTECTION MEASURES.

Air Quality

- 3.16 The Development and Planning Commission supports the Government's aim of ensuring that Gibraltar's air quality is of a good standard and meets the relevant EU requirements. The recent introduction of air monitoring stations at the southern end of Rosia Road, at

Bleak House, Europa Point, and at Witham's Road will enable more accurate recording of air quality than has been possible previously. Air quality can have a direct impact on human health as well as the environment generally. The objective therefore is to ensure that proposed development does not have a significant adverse effect on Gibraltar's air quality. In some cases a potentially polluting proposal may be acceptable where it can be shown that appropriate mitigation measures will be implemented to ensure that there is no unacceptable long-term effect on air quality.

Water quality

- 3.17 Potable water in Gibraltar is provided almost exclusively through a desalination process and the quality of Gibraltar's coastal waters is therefore of prime importance. In addition, Gibraltar's coastal waters are heavily used for recreational purposes, and to a certain extent for fishing. The rich marine environment found in Gibraltar's waters is also extremely susceptible to changes in water quality. The quality of Gibraltar's coastal waters has the potential to significantly affect these different interests. In addition the recent introduction of the Water Framework Directive (2000/60/EC) places an additional legal requirement on the Government to ensure that water quality reaches a 'good' status.
- 3.18 It is therefore important to ensure that new development proposals do not adversely affect water quality. Development has the potential to affect water quality through, for example, effluent discharges from industrial processes, from surface water run off which may be contaminated, and through the treatment and discharge of sewage.
- 3.19 It will therefore be necessary for applicants to demonstrate that where there is a risk of a proposed development resulting in an adverse effect on water quality, appropriate mitigation measures can be implemented to ensure that water quality is not seriously compromised.

POLICY ENV7 – AIR AND WATER QUALITY

PLANNING PERMISSION WILL ONLY BE GRANTED FOR DEVELOPMENT PROPOSALS THAT COULD POTENTIALLY HAVE A SIGNIFICANT ADVERSE EFFECT ON AIR OR WATER QUALITY IF IT CAN BE DEMONSTRATED, TO THE SATISFACTION OF THE COMPETENT AUTHORITY, THAT APPROPRIATE MITIGATION MEASURES CAN BE IMPLEMENTED TO MINIMISE SUCH EFFECTS.

- 3.20 It is of vital strategic importance that Gibraltar has more than one source of seawater for desalination to ensure security of supply. There should be at least two distinct sites with access to high quality seawater for Gibraltar's desalination plant located remotely from each other to safeguard against plant outage due to seawater pollution, algal blooms, etc. Similarly, access to good quality seawater is fundamental for the salt water system seawater pumping stations.
- 3.21 Currently desalination plant are located at the ex-MOD laundry at Governor's Cottage (with the source located at Little Bay) and at the North Mole (although this plant is nearing the end of its useful life – see sections 11 and 13). Saltwater pumping stations are located at Gun Wharf and North Mole.

- 3.22 Any proposed developments in the vicinity of any existing or future seawater intakes used for desalination or for saltwater distribution will need to pay particular attention to the need to ensure that there is no adverse effect on seawater quality.

POLICY ENV8 – PROTECTION OF WATER QUALITY IN THE VICINITY OF SEA WATER INTAKES

PROPOSALS IN THE VICINITY OF SEAWATER INTAKES, EXISTING OR FUTURE, WILL NEED TO TAKE PARTICULAR ACCOUNT OF THE NEED TO ENSURE THAT THERE IS NO ADVERSE EFFECT ON SEA WATER QUALITY.

Noise and dust nuisance

Noise

- 3.23 Noise can have a significant effect on the environment and on the quality of life of residents and the community generally. The noise generated by development can be short term, i.e. that generated by the physical construction process and use of associated plant and machinery, or long term, i.e. the actual development itself, once operational, generates noise.
- 3.24 The Development and Planning Commission recognises that much development that is necessary for job creation and for the construction and improvement of infrastructure will generate noise, as will the physical process of construction itself. Nevertheless, the Development and Planning Commission must ensure that disturbance is minimised as far as is practicable.
- 3.25 In considering applications for noise-generating developments the Development and Planning Commission will wish to be satisfied that due attention has been paid to minimising the impact of noise on surrounding receptors. This is particularly so where a noise-generating proposal is to be sited near existing noise-sensitive developments such as hospitals and schools. In addition, the Development and Planning Commission will wish to ensure that noise disturbance arising from the physical construction process is minimised and where appropriate conditions may be imposed on hours of working.

POLICY ENV9 – NOISE

IN CONSIDERING APPLICATIONS FOR NOISE-GENERATING DEVELOPMENTS DUE CONSIDERATION MUST BE GIVEN TO MINIMISING THE IMPACT OF NOISE ON ADJACENT AREAS THROUGH THE DESIGN AND LAYOUT OF THE PROPOSED DEVELOPMENT AND BY THE USE OF OTHER MITIGATING MEASURES SUCH AS PHYSICAL SCREENING OR HOURS OF OPERATION.

IN CONSIDERING APPLICATIONS FOR ALL TYPES OF DEVELOPMENT THE DEVELOPMENT AND PLANNING COMMISSION WILL CONSIDER THE LIKELY SHORT TERM IMPACT FROM CONSTRUCTION NOISE ON ADJACENT AREAS, AND WHERE THIS IS CONSIDERED TO BE SIGNIFICANT MAY IMPOSE CONDITIONS TO MITIGATE THE EFFECTS THROUGH, FOR EXAMPLE, LIMITING HOURS OF CONSTRUCTION WORK, OR LIMITING THE LOCATION OF CERTAIN PLANT AND MACHINERY WITHIN THE SITE.

Dust

- 3.26 As for noise, dust, particularly during construction work, can cause a nuisance to nearby residents and the community generally. The Development and Planning Commission will therefore seek to ensure that appropriate measures are taken to minimise dust nuisance.

POLICY ENV10 – DUST NUISANCE

IN CONSIDERING APPLICATIONS FOR NEW DEVELOPMENT CAREFUL ATTENTION WILL NEED TO BE PAID TO MEASURES TO ENSURE THAT DUST DURING CONSTRUCTION WORKS IS PROPERLY CONTAINED TO MINIMISE NUISANCE TO ADJACENT USERS. WHERE APPROPRIATE, THE DEVELOPMENT AND PLANNING COMMISSION MAY IMPOSE CONDITIONS AIMED AT MITIGATING THE POTENTIAL EFFECT OF DUST NUISANCE.

Natural environment

Biodiversity

- 3.27 It is important to conserve, manage and enhance Gibraltar’s biodiversity for the benefit of future generations, because of its contribution to the environment in which we live and as part of a global effort to reduce the loss of biodiversity.
- 3.28 Gibraltar has international obligations, by virtue of it being a European territory, to conserve and protect its unique wildlife and habitats. The EU Birds Directive, the Bonn Convention (on conservation of migratory wild animals), EU Habitats Directive and Natura 2000 Network are just some of the conventions, Directives and Agreements with which Gibraltar complies.
- 3.29 The Gibraltar Ornithological and Natural History Society has published “Biodiversity Action Plan, Gibraltar: Planning for Nature”, 2006, that provides useful information on Gibraltar’s biodiversity.
- 3.30 Development proposals can offer opportunities as well as represent a threat to biodiversity and it is therefore relevant for the Plan to provide guidance on this subject.
- 3.31 Development proposals should take every opportunity to protect, conserve and enhance natural features for their own sake but also to provide opportunities for the quiet enjoyment of nature. This includes the protection of important sites of ecological value and the provision of new habitat within new development. This can be achieved through careful landscaping

and by designing for biodiversity, through for example designing for nests and roosts within buildings, designing coastal revetments in land reclamation projects so as to create appropriate conditions for marine species, or through the provision of green roofs. Some of the more specific measures are covered by policies later in this section but the policy below is intended as a general over-arching policy that will apply to all development.

POLICY ENV11 - BIODIVERSITY

THE PROTECTION AND ENHANCEMENT OF BIODIVERSITY SHALL BE AN IMPORTANT CONSIDERATION IN THE DETERMINATION OF PLANNING APPLICATIONS. THE DEVELOPMENT AND PLANNING COMMISSION SHALL, WHEREVER POSSIBLE, SEEK THE:

- A) PROTECTION, MANAGEMENT AND ENHANCEMENT OF NATURAL LANDSCAPE, WILDLIFE AND WILDLIFE HABITAT, AND THE CREATION OF NEW WILDLIFE HABITAT;***
- B) APPROPRIATE PROVISION OF PUBLIC ACCESS TO NATURAL AREAS PROVIDED THAT SUCH ACCESS DOES NOT SIGNIFICANTLY PREJUDICE THE BIODIVERSITY OF THE AREA; AND***
- C) INCORPORATION OF APPROPRIATE NEW WILDLIFE HABITAT INTO LANDSCAPING AND BUILDINGS.***

Trees and Green areas

3.32 Trees and green areas make a valuable contribution towards the appearance of an area as well as being of significant ecological value. Such features are an integral part of the townscape or landscape and make a significant contribution to the character of the area. The Development and Planning Commission therefore wishes to retain such features wherever possible. Where there is no alternative to the loss of a tree as a result of development, and permission is granted, there will normally be a requirement for two new trees to be planted for each tree lost, as a compensation measure.

3.33 Where it is considered that specific control is required in relation to a tree(s) the Development and Planning Commission is empowered to make a Tree Preservation Order. The effect of this Order is to control virtually all kinds of works to the tree(s). The two largest concentrations of tree areas are the Upper Rock and Alameda Gardens, both of which are subject to specific policies that are set out in the respective sections of this Plan. Elsewhere the following policies apply.

POLICY ENV12 - TREES

PERMISSION FOR DEVELOPMENT INVOLVING THE CUTTING DOWN OR REMOVAL OF TREES WILL ONLY BE GRANTED WHERE:

- A) THE PROPOSED DEVELOPMENT IS OTHERWISE ACCEPTABLE; AND***

B) THE DEVELOPMENT AND PLANNING COMMISSION IS SATISFIED THAT THE DEVELOPMENT CANNOT BE REDESIGNED TO AVOID THE REMOVAL OF THE TREE(S).

WHERE THE REMOVAL OF A TREE(S) IS PERMITTED THE DEVELOPMENT AND PLANNING COMMISSION SHALL NORMALLY REQUIRE THE PLANTING OF TWO REPLACEMENT TREES FOR EACH TREE LOST, EITHER ON THE APPLICATION SITE OR ON AN ALTERNATIVE SITE IDENTIFIED BY THE COMMISSION.

POLICY ENV13 – TREE PRESERVATION ORDERS

TREE PRESERVATION ORDERS SHALL BE MADE WHERE TREES CONSTITUTE A SIGNIFICANT CONTRIBUTION TO THE ENVIRONMENT AND WHERE IT IS CONSIDERED DESIRABLE THAT THEY SHOULD BE PROTECTED.

Sites of ecological value

- 3.34 Gibraltar has significant areas of ecological value both terrestrial and marine. The Upper Rock Nature Reserve was formally designated as a Nature Conservation Area in 1993 under the Nature Protection Act. The Nature Protection Act also provides legal protection for many species of flora and fauna throughout Gibraltar. A marine Nature Reserve has also been proposed but is yet to be formally designated. Details of Special Areas of Conservation are given below. Specific policies relating to the Upper Rock are contained in the relevant section of Part II of this Plan.
- 3.35 Apart from their ecological value such sites can also be an important recreational and educational resource. The Development and Planning Commission will seek to ensure that such sites are not detrimentally affected either directly or indirectly, by development proposals.

POLICY ENV14 – SITES OF ECOLOGICAL VALUE

PLANNING PERMISSION FOR DEVELOPMENT THAT WOULD HAVE A SIGNIFICANT ADVERSE EFFECT ON IDENTIFIED SITES OF ECOLOGICAL VALUE WILL NOT NORMALLY BE GRANTED.

- 3.36 The Government has identified the Upper Rock area (including the Great Sand Slopes), Windmill Hill and part of the southern coastline as being of European Community importance based on the natural habitats and species they host, under the provisions of the EU Habitats Directive. The EU has accepted these proposals and as such these sites are classified as Sites of Community Importance (SCIs). The SCIs will in due course be designated as Special Areas of Conservation in accordance with the provisions of the Habitats Directive and the Nature Protection Act. Development proposals that are not directly connected with or necessary to the management of these sites and is, or are likely to have a significant

effect on such sites will need to be the subject of an 'appropriate assessment' to be carried out by the relevant authority. Development proposals that will have an adverse effect on the integrity of such a site will not normally be permitted.

POLICY ENV15 – SITES OF COMMUNITY IMPORTANCE/SPECIAL AREAS OF CONSERVATION

PLANNING PERMISSION WILL NOT NORMALLY BE GRANTED FOR DEVELOPMENT THAT WILL AFFECT THE INTEGRITY OF A DESIGNATED SITE OF COMMUNITY IMPORTANCE/SPECIAL AREA OF CONSERVATION, AS SHOWN ON THE PROPOSALS MAP.

Bats and swifts

- 3.37 All bats and swifts are protected by virtue of the Nature Protection Act, 1991. The law protects the swifts, their nests and eggs and prohibits any disturbance to nesting birds on or near the nest. Thus for example, the erection of scaffolding, etc, on the side of a building near swift nests could interfere with the swift's access to the nesting site. Bats too are given special protection because of their roosting requirements. It is therefore an offence to intentionally damage, destroy or obstruct access to any place that a bat uses for shelter or protection, including houses and outbuildings.
- 3.38 Building work represents a risk to both bats and swifts due to the possible loss of roosts and nests and the potential disturbance caused. It is therefore important for applicants to establish at an early stage whether their development proposal is likely to have an impact on either of these species. Advice is available from the Gibraltar Ornithological and Natural History Society.

POLICY ENV16 – BATS AND SWIFTS

DEVELOPMENT PROPOSALS THAT ARE LIKELY TO:

- A) AFFECT EITHER EXISTING BAT ROOSTS OR SWIFT NESTS, AND/OR***
- B) OFFER AN OPPORTUNITY TO PROVIDE SUCH ROOSTING OR NESTING SITES,***

WILL NORMALLY ONLY BE GRANTED PERMISSION WHERE SUITABLE PROVISION HAS BEEN MADE TO ACCOMMODATE THE ROOSTING AND NESTING REQUIREMENTS OF SWIFTS AND BATS AS RELEVANT.

- 3.39 Where a development proposal is likely to affect either bats or swifts, or where a proposal offers the opportunity to provide additional roosting or nesting sites, the Development and Planning Commission will expect the applicant to design into the proposal the appropriate facilities to accommodate roosts/nests.

Built and Historic Environment

Environmental Improvements

3.40 The Government has undertaken a programme of environmental improvements since the production of the 1991 Plan. Schemes that have been carried out include:

- Pedestrianisation and environmental improvement of Main Street and its side streets
- Casemates Square and John Mackintosh Square
- Environmental improvement of Waterport Road
- Environmental improvement of Laguna Estate
- Environmental improvement of Glacis Estate
- Environmental improvement of Sir Winston Churchill Avenue
- Environmental improvement of Sir Herbert Miles Road
- Environmental improvement of Catalan Bay village (phases 1 and 2)
- Harbour Views promenade.

3.41 Schemes such as those above have had a significant impact on Gibraltar's environment and it is intended to continue with a planned programme of Environmental Improvements.

3.42 In formulating environmental improvement schemes, the Development and Planning Commission shall actively encourage the introduction of new or additional tree planting on streets.

POLICY ENV17 – ENVIRONMENTAL IMPROVEMENT SCHEMES

ENVIRONMENTAL IMPROVEMENT SCHEMES SHALL CONTINUE TO BE UNDERTAKEN IN ACCORDANCE WITH THE GOVERNMENT'S PLANNED PROGRAMME THAT SHALL BE KEPT UNDER REVIEW.

Historic Environment

3.43 The Development and Planning Commission places great emphasis on the protection of Gibraltar's historic environment that it considers should be valued for its own sake, as a central part of our cultural heritage and our sense of national identity. The historic environment contributes to our understanding of both the present and the past and adds to the quality of life by enhancing the familiar local scene and sustaining the sense of local distinctiveness. The Development and Planning Commission wishes to ensure that Gibraltar's historic environment is managed properly and therefore in addition to this Plan that deals with the planning aspect of the historic environment, it welcomes and supports the Government's intention to prepare a Heritage Management Plan that shall provide guidance on the future maintenance and management of Gibraltar's heritage.

3.44 The Heritage Trust Act, 1999, provides the legislative framework for, amongst other matters, the conservation of listed buildings, structures, sites and land. The Government is in the process of reviewing the current legislation and it is expected that the revised legislation will come into effect during the early part of the life of this Plan. Some of the policies contained in the Plan will be dependent on the introduction of new legislation, namely policies relating to the designation and control of development in Conservation Areas.

3.45 This section contains general planning policies on the historic environment, but in addition there will be policies and proposals that apply to specific areas contained in Part II of this Plan, the Old Town Plan and the Design Guide for the Old Town.

Conservation Areas

3.46 A Conservation Area is an area of special architectural, scientific, historic or other cultural interest the character or appearance of which it is desirable to preserve or enhance. Conservation Areas will be designated under the provisions of a new Heritage Act once this has been enacted.

3.47 The designation of Conservation Areas shall be kept under review and alterations and additions shall be made where appropriate.

POLICY ENV18 – DESIGNATION OF CONSERVATION AREAS

THE DESIGNATION OF CONSERVATION AREAS SHALL BE KEPT UNDER REVIEW AND ALTERATIONS AND ADDITIONS SHALL BE MADE AS APPROPRIATE.

3.48 The designation of a Conservation Area does not preclude new development. Indeed, new development that positively contributes towards the character or appearance of a Conservation Area is to be encouraged. It is important that planning policy does not restrict essential change provided always that the change does not detract from the character or appearance that led to its designation in the first place.

POLICY ENV19 – DEVELOPMENT WITHIN CONSERVATION AREAS

PLANNING PERMISSION FOR DEVELOPMENT PROPOSALS WITHIN CONSERVATION AREAS WILL ONLY BE GRANTED WHERE THE PROPOSAL:

- A) RESPECTS THE HISTORIC CONTEXT IN SCALE, HEIGHT, MASSING, FORM AND LAYOUT;***
- B) IS SYMPATHETIC TO THE SITE, ITS SETTING AND SURROUNDINGS IN TERMS OF DETAILED DESIGN, USE OF MATERIALS AND COLOURS;***
- C) DOES NOT RESULT IN THE LOSS OF BUILDINGS THAT ARE EITHER OF HISTORICAL VALUE OR FORM AN IMPORTANT PART OF A GROUP OF BUILDINGS, THAT CONTRIBUTE TO THE SPECIAL CHARACTER AND APPEARANCE OF THE CONSERVATION AREA;***
- D) DOES NOT RESULT IN THE LOSS OF IMPORTANT BOUNDARY FEATURES SUCH AS TREES, WALLS, OR RAILINGS THAT CONTRIBUTE TO THE SPECIAL CHARACTER OF THE AREA;***
- E) PRESERVES OR ENHANCES IMPORTANT VIEWS INTO OR OUT OF THE AREA;***

F) PRESERVES OR ENHANCES IMPORTANT OPEN SPACES BETWEEN BUILDINGS; AND

G) PRESERVES OR ENHANCES ANY OTHER FEATURE THAT CONTRIBUTES TO THE CHARACTER AND APPEARANCE OF THE CONSERVATION AREA.

DEVELOPMENTS IN THE VICINITY OF A CONSERVATION AREA THAT WOULD HAVE A SIGNIFICANT ADVERSE EFFECT ON THE CHARACTER OR APPEARANCE OF A CONSERVATION AREA WILL NOT BE PERMITTED.

3.49 Due to the particularly sensitive nature of Conservation Areas and the need to fully consider the impact of a proposal on its character and appearance, applications for development within Conservation Areas will need to be accompanied by detailed plans and drawings of both the 'as existing' situation and the proposed development, including elevations that show it in the context of its setting. For this reason outline applications will not normally be accepted for development proposals within Conservation Areas.

Protected monuments, buildings and properties

3.50 The Heritage Trust Act makes provision for the protection of identified monuments, buildings and properties including all of the City Walls and many individual properties. To justify protection under the Act these buildings or structures (that can be on land, sea or under the sea bed) must be of special architectural, scientific or historic interest the character or appearance of which it is desirable to preserve or enhance.

3.51 The designation of protected monuments, buildings and properties shall be kept under review and amendments and additions shall be made as appropriate.

POLICY ENV20 – DESIGNATION OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES

THE DESIGNATION OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES SHALL BE KEPT UNDER REVIEW AND AMENDMENTS AND ADDITIONS MADE AS APPROPRIATE.

3.52 Protected monuments, buildings and properties form an important part of Gibraltar's heritage and there will always be a presumption in favour of their preservation, protection and enhancement. It is recognised however, that the best way of securing the upkeep of historical structures is to keep them in active use. This may require adaptation through for example, alteration and extension. Such changes should be kept to a minimum and relate sensitively to the existing structure in terms of scale, layout, architectural detailing, materials and colour. Uses that are inappropriate or potentially harmful would not be permitted. Alternative uses need to be compatible with the fabric, interior and setting of the structure.

POLICY ENV21 – ALTERATIONS, EXTENSIONS AND CHANGE OF USE OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES.

APPLICATIONS FOR THE ALTERATION, EXTENSION OR CHANGE OF USE OF A PROTECTED MONUMENT, BUILDING OR PROPERTY MUST CONTAIN SUFFICIENT INFORMATION AGAINST WHICH THE IMPACT ON THE FABRIC AND APPEARANCE OF THE BUILDING CAN BE ASSESSED. PERMISSION WILL ONLY BE GRANTED WHERE THE PROPOSAL:

- A) HAS NO SIGNIFICANT ADVERSE IMPACT ON THE EXISTING BUILDING OR STRUCTURE BY REASON OF ITS SCALE, DESIGN, LAYOUT, DETAIL AND USE OF MATERIALS;*
- B) SAFEGUARDS THE ARCHITECTURAL CHARACTER AND/OR HISTORIC FEATURES WHICH ARE IMPORTANT TO THE BUILDING (INCLUDING INTERNAL FEATURES);*
- C) SAFEGUARDS THE HISTORIC FORM AND STRUCTURAL INTEGRITY OF THE BUILDING OR STRUCTURE; AND*
- D) INVOLVES A USE THAT WOULD CONTRIBUTE TOWARDS THE LONG TERM RETENTION OF THE BUILDING OR STRUCTURE AND WOULD PRESERVE ANY HISTORIC, ARCHAEOLOGICAL OR SPECIAL ARCHITECTURAL FEATURES.*

3.53 It is important to consider the wider impact of any proposed development. The relationship between a protected monument, building or property, and its surroundings can often be as important as the detailing of the structure itself. This is particularly so when the relationship with nearby open spaces, prominent sites and other buildings is taken into account. Unsympathetic development that detracts from the appearance and/or setting of such structures shall not therefore be permitted.

POLICY ENV22 – SETTING OF PROTECTED MONUMENTS, ETC.

PROPOSALS THAT WOULD ADVERSELY AFFECT THE SETTING OR APPEARANCE OF A PROTECTED MONUMENT, BUILDING OR PROPERTY, WILL NOT NORMALLY BE PERMITTED.

3.54 The total or substantial demolition of a protected monument, building or property, or of any significant part of it, runs counter to the objective of preserving, protecting and enhancing such structures. There will therefore be a general presumption against such proposals. It is only in exceptional circumstances that such proposals will be considered favourably and the Development and Planning Commission, in coming to its decision will need to consider:

- a) The condition of the building, the cost of repairing and maintaining it in relation to its importance and to the value derived from its continued use;

- b) The adequacy of efforts made to retain the building in its use;
- c) The merits of alternative proposals for the site.

3.55 Permission for such proposals will not be granted until a satisfactory redevelopment scheme has been approved.

POLICY ENV23 – DEMOLITION OF PROTECTED MONUMENTS, BUILDINGS AND PROPERTIES.

THERE WILL BE A PRESUMPTION AGAINST THE TOTAL OR PARTIAL DEMOLITION OF ANY PROTECTED MONUMENT, BUILDING OR PROPERTY. PERMISSION WILL ONLY BE GRANTED IN VERY EXCEPTIONAL CIRCUMSTANCES AND DUE REGARD WILL BE HAD TO:

- A) THE CONDITION OF THE BUILDING, THE COST OF REPAIRING AND MAINTAINING IT IN RELATION TO ITS IMPORTANCE AND TO THE VALUE DERIVED FROM ITS CONTINUED USE;***
- B) THE ADEQUACY OF EFFORTS MADE TO RETAIN THE BUILDING IN ITS USE; AND***
- C) THE RELATIVE BENEFITS THAT REDEVELOPMENT WOULD BRING TO THE COMMUNITY AND THE EXTENT TO WHICH THIS WOULD OUTWEIGH THE LOSS OF THE BUILDING/STRUCTURE.***

PERMISSION FOR ANY DEMOLITION WILL NOT BE GRANTED UNTIL A SUITABLE REDEVELOPMENT SCHEME HAS BEEN APPROVED.

Sites of Archaeological importance

3.56 Gibraltar has a rich archaeological heritage, both land-based and marine, which is an essential source of information on Gibraltar's past, the history of humanity, contributes towards the sense of place and national identity and has educational, leisure and tourism value.

3.57 Heritage legislation makes provision for the designation of areas of archaeological importance within which any works will be strictly controlled. In such areas permission will be required under both the Heritage and Town Planning Acts. In addition there may be other areas that are not designated but may nevertheless contain important archaeological remains. Before schemes are approved the relative archaeological importance of the site will need to be assessed and therefore it is important that applicants establish at an early stage in the design process whether or not the site is likely to be of archaeological importance.

3.58 There will be a presumption against development that adversely affects important sites and their setting. Whilst there will be cases where the importance of the archaeological remains requires their preservation in-situ, in many cases, mitigation measures (through for example, the careful design of development, prior excavation and recording or an archaeological watching brief during construction) will provide adequate protection.

POLICY ENV24 – ARCHAEOLOGICAL SITES

THERE WILL BE A GENERAL PRESUMPTION AGAINST DEVELOPMENT THAT HAS A SIGNIFICANT ADVERSE EFFECT ON DESIGNATED SITES OF ARCHAEOLOGICAL IMPORTANCE.

ON OTHER SITES OF ARCHAEOLOGICAL IMPORTANCE PERMISSION WILL ONLY BE GRANTED WHERE THE IMPORTANCE OF THE PROPOSED DEVELOPMENT OUTWEIGHS THE VALUE OF THE REMAINS IN QUESTION. IN SUCH CIRCUMSTANCES ADEQUATE PROVISION SHALL BE REQUIRED FOR THE ARCHAEOLOGICAL EVALUATION, INVESTIGATION AND RECORDING OF SITES. THIS WILL NORMALLY BE ACHIEVED THROUGH THE USE OF PLANNING CONDITIONS.

4 HOUSING

General

- 4.0 Housing is a major land use and is a major determinant of the requirement and distribution of other land uses such as educational, community and recreational facilities. Housing policies and proposals invariably cause the greatest debate and interest since it affects every member of the community.
- 4.1 Due to the limited availability of land housing has always been a problem in Gibraltar and historically there has always been a shortage of suitable housing to meet the demands and needs of the local population.
- 4.2 There is a high demand for housing in Gibraltar with some of the more significant contributory factors being:
- Changes in aspirations of the local population who wish to have their own accommodation rather than sharing;
 - Decreasing household size - average household size has decreased from 3.4 in 1981 to 2.8 in 2001¹. Increasing numbers of single parents, increased divorce rates and increased life expectancy all contribute towards smaller household size and greater demand.
 - An increase in people wishing to purchase property in Gibraltar but who are only resident for part of the year.

The Housing Market

- 4.3 There are a number of distinct categories that make up Gibraltar's housing market:
- Government – rented housing
 - Private – rented housing
 - Owner-occupation – split into controlled and open market.
 - MOD housing
- 4.4 Whilst the Development Plan is only concerned with the civilian housing market the existence of MOD housing needs to be acknowledged. This is important because this has provided a source of housing stock (or at least housing land) in the past as it has become surplus to MOD requirements. Clearly, as a source of housing this was most important during the period that MOD was cutting back its operations in Gibraltar. Whilst the downsizing of the MOD in Gibraltar has essentially stabilised now, the Government continues to negotiate with the MOD with a view to obtaining sites or existing MOD housing stock that it no longer requires. The recent negotiations between the Government and the MOD has resulted in the phased release of various sites throughout Gibraltar, many of which will make an important contribution to Gibraltar's housing stock.
- 4.5 The structure of the housing market has undergone significant structural changes since the 1980s. In 1981 the Government rented sector accounted for 65% of households, private

¹ Census 2001

rented for 29.8%, and owner occupied for only 5.2%. By 2001 the figure for Government rented had dropped to 44%, private rented to 13.8% and owner occupation had risen to 24.4% and a new category of co-ownership accounted for 17%. Owner-occupation (either fully or co-owned) therefore accounted for over 41%¹.

- 4.6 This change in the housing market structure was largely due to:
- Government policy to promote home ownership;
 - Significant reclamation projects;
 - Downsizing of MOD and consequent release of MOD housing.
- 4.7 This Plan aims to continue the existing policy of encouragement of home ownership either through the open market or through co-ownership. In addition to the site –specific policies and proposals set out in Part II of this Plan the following general policies will apply.

POLICY H1 – HOME OWNERSHIP

INCREASED HOME OWNERSHIP BY THE LOCAL POPULATION WILL BE ENCOURAGED. THE HOME OWNERSHIP MARKET WILL BE DIVIDED INTO TWO SECTORS:

- A) THE CONTROLLED MARKET WHERE PRICES AND ALLOCATIONS WILL BE REGULATED UNDER AGREEMENTS WITH THE GOVERNMENT;***
- B) THE OPEN MARKET WHERE NO CONTROLS WILL BE IMPOSED ON THE SELLING PRICE.***

SITES SUITABLE FOR EACH OF THESE MARKETS WILL BE IDENTIFIED AS APPROPRIATE.

- 4.8 The main mechanism by which the Government can pursue the above policy objective is through its control of Crown land. Crown land may become available for development for a number of reasons. It could for example, be land previously occupied by the MOD and returned to the Government, it may be land that is currently vacant, or it may be land that becomes available as a result of the relocation of an existing user(s) to an alternative site. Obviously there are many competing demands for available land in Gibraltar but where the Government determines that it wishes to release the land for residential development it will need to determine the type of residential development that should take place. In reaching this decision the above policy objective should be taken into account together with any assessment of the current housing market. This Plan specifically allocates those sites that are currently known to be available for development, however, as circumstances change over time constant monitoring will be required and the results incorporated into any review of the Plan.
- 4.9 There is a need to cater for all sectors of the housing market. Private sector developments for sale in the open market will continue to be encouraged. Such developments are an important housing source for both the local population as they move up the property ladder and also for people who, whilst they may not reside in Gibraltar full time, do wish to have

¹ Census, 2001

residences in Gibraltar. For those on lower incomes, the Government will continue to make provision for 'affordable housing'.

- 4.10 In order to cater for the full requirements of the housing market it is important to seek to ensure that a variety of accommodation is provided through new developments or conversions. In particular, the needs of the elderly and disabled need to be taken into account. Whilst the Government may be the main provider of such housing, it is expected that the private sector should also take into account these groups and incorporate their needs into the design of their proposals.

POLICY H2 – HOUSING RANGE

THE PROVISION OF A RANGE OF HOUSING TYPES AND SIZES, INCLUDING THOSE SUITABLE FOR THE ELDERLY AND DISABLED, WILL BE ENCOURAGED.

- 4.11 In considering housing development for the elderly, particular regard should be given to the desirability of locating such development close to public transport facilities and to local services and facilities.

POLICY H3 – HOUSING SCHEMES FOR THE ELDERLY

IN CONSIDERING RESIDENTIAL DEVELOPMENT PROPOSALS FOR THE ELDERLY PARTICULAR ATTENTION SHALL BE PAID TO PROXIMITY TO PUBLIC TRANSPORT FACILITIES, AND OTHER LOCAL SERVICES

Efficient use of existing residential stock

- 4.12 The general shortage of land in Gibraltar and high demand for housing means that existing residential stock is an important resource. However, the existing stock must be put to effective use if it is to make a contribution to meeting housing demand. Frequently the internal distribution of, generally, older residential stock may be unattractive to the present day housing market. This may be the case where residential buildings have been either built originally, or later sub-divided, so as to provide a number of smaller units which are now no longer attractive to the current market. Conversely, buildings constructed as single residences or very large units may similarly be unattractive to the current market. The Development and Planning Commission is therefore keen to ensure that the existing stock is put to effective use, providing accommodation of a type and standard that will be attractive to the current housing market.
- 4.13 In considering proposals that would result in the loss of accommodation for existing occupiers the Development and Planning Commission shall take into account all the particular circumstances of the occupiers, including (but not limited to) the length the occupier has been a tenant, the pattern of occupation of the premises and the prospect of re-housing for the existing occupiers.

- 4.14 The above represents the Development and Planning Commission's general approach. However, the Old Town Plan provides specific policy guidance on proposals involving the change of use of existing residential stock and the Development and Planning Commission shall apply these policies as relevant.

POLICY H4 – EFFECTIVE USE OF EXISTING RESIDENTIAL STOCK

THE DEVELOPMENT AND PLANNING COMMISSION WILL ENCOURAGE THE EFFECTIVE USE OF EXISTING RESIDENTIAL STOCK. THE DEVELOPMENT AND PLANNING COMMISSION WILL, IN CONSIDERING ANY PROPOSAL THAT WILL RESULT IN THE LOSS OF ACCOMMODATION FOR EXISTING OCCUPIERS, TAKE INTO ACCOUNT ALL THE CIRCUMSTANCES INCLUDING THE PROSPECTS OF RE-HOUSING FOR THE EXISTING OCCUPIERS.

Conversion of residential buildings

- 4.15 As explained above the Development and Planning Commission is keen to ensure the effective use of existing residential stock. The conversion of houses into flats helps to increase the total housing stock available in the market as well as provide smaller units that are suitable for single people or smaller households. This is especially important when it can be seen that there are increasing numbers of single people and the average household size has dropped from 3.4 in 1981 to 2.8 in 2001.
- 4.16 Similarly, the amalgamation of two or more smaller units to create a single residence can ensure beneficial use of existing stock that may otherwise be unattractive to the housing market.
- 4.17 Whilst such conversions are acceptable in principle, it is necessary to ensure that a satisfactory standard of accommodation is provided and that there are no significant detrimental effects on surrounding properties or the area generally.
- 4.18 Conversion into multiple occupation – where the accommodation is shared rather than divided into self-contained units – will not normally be permitted. The multiple occupation of residential accommodation will not normally be consistent with the aim of improving the quality of the housing stock and avoiding detrimental effects on neighbouring occupiers.

POLICY H5 – CONVERSION OF RESIDENTIAL BUILDINGS

THE CONVERSION OF LARGE RESIDENTIAL UNITS INTO SMALLER UNITS, OR THE AMALGAMATION OF SMALLER UNITS INTO A SINGLE, OR A NUMBER OF LARGER UNITS, WILL NORMALLY BE ACCEPTABLE, SUBJECT TO:

- A) SATISFACTORY ACCOMMODATION BEING PROVIDED IN TERMS OF SIZE, LAYOUT AND PROVISION OF ADEQUATE FACILITIES; AND***

B) CAR PARKING PROVISION AND OTHER STANDARDS AS CONTAINED IN REGULATIONS BEING MET UNLESS THE DEVELOPMENT AND PLANNING COMMISSION CONSIDERS THAT THERE ARE JUSTIFIABLE REASONS FOR THESE TO BE RELAXED OR WAIVED.

HOWEVER, CONVERSIONS INTO MULTIPLE OCCUPATION WILL ONLY BE ALLOWED WHERE EXCEPTIONAL CIRCUMSTANCES CAN BE DEMONSTRATED.

Redevelopment of existing residential sites

- 4.19 In certain cases, it may be appropriate for an existing residential site to be completely redeveloped. This may be the case where, for example, an existing site is under-used and can be redeveloped to maximise its potential. Alternatively, there may be cases where an existing residential site is inappropriately located and there may be benefits in redeveloping the site for alternative use. However, where the development involves the demolition of existing buildings the Development and Planning Commission will want to be satisfied that these do not merit retention due to any heritage significance. The Development and Planning Commission will also need to be satisfied that the redevelopment proposal will not have any significant detrimental impacts on surrounding uses.
- 4.20 In appropriate locations, the Development and Planning Commission will encourage a mix of uses to ensure that the development makes a positive contribution to the vitality of the area.

POLICY H6 – REDEVELOPMENT OF RESIDENTIAL ACCOMMODATION

PROPOSALS FOR THE REDEVELOPMENT OF EXISTING RESIDENTIAL ACCOMMODATION WILL BE ASSESSED, IN PARTICULAR, AGAINST:

- A) THE SUITABILITY OF THE EXISTING RESIDENTIAL USE IN TERMS OF ITS LOCATION, SIZE, DISTRIBUTION, CONDITION AND GENERAL STANDARD OF ACCOMMODATION;**
- B) THE PROPOSED MIX OF USES AND THEIR COMPATIBILITY WITH THE SURROUNDING ENVIRONMENT; AND**
- C) THE HERITAGE VALUE OF ANY BUILDINGS THAT WOULD BE DEMOLISHED AS PART OF THE PROPOSAL.**

Additional storeys

- 4.21 Additional residential accommodation can often be provided by adding to the height of an existing building. Such proposals will normally be granted permission provided that they do not have a significant detrimental effect on either the character and appearance of the building or the area in which it is located. Most proposals for this type of development occur in the town area. The dense nature of development in this area means that increasing the

height of one building will invariably have an effect on adjacent buildings. The potential effect of a proposal on adjacent occupiers must therefore be taken into consideration at an early stage in the design process to ensure that impact of the proposal on adjacent occupiers is minimised. It is also advisable for applicants to secure the advice of a structural engineer at an early stage in the process as many of Gibraltar's older buildings, particularly those constructed of random rubble walls, may not be able to support additional loads.

POLICY H7 – INCREASES IN HEIGHT

PROPOSALS TO INCREASE THE HEIGHT OF EXISTING RESIDENTIAL BUILDINGS IN ORDER TO PROVIDE ADDITIONAL ACCOMMODATION WILL NORMALLY BE PERMITTED PROVIDED:

- A) IT COMPLIES WITH THE RELEVANT FLOOR SPACE INDEX AS SET OUT IN THE TOWN PLANNING ACT;***
- B) THERE IS NO DETRIMENTAL EFFECT ON THE CHARACTER AND APPEARANCE OF THE BUILDING OR THE AREA;***
- C) SATISFACTORY CAR PARKING ARRANGEMENTS CAN BE PROVIDED UNLESS THE DEVELOPMENT AND PLANNING COMMISSION CONSIDERS THAT THERE ARE JUSTIFIABLE REASONS FOR THE CAR PARKING REQUIREMENTS TO BE RELAXED OR WAIVED.***

Schemes for the elderly – car parking requirement

4.22 Car ownership levels amongst residents of schemes for the elderly tend to be lower than for standard residential accommodation. As such, a reduced car parking standard may be applied to such development proposals.

POLICY H8 – DEVELOPMENT FOR THE ELDERLY - CAR PARKING STANDARDS

PROPOSALS FOR RESIDENTIAL DEVELOPMENT FOR THE ELDERLY WILL BE SUBJECT TO A REDUCED CAR PARKING STANDARD OF ONE OFF-STREET PARKING SPACE PER 4 HOUSEHOLDS.

Beautification of residential estates.

4.23 Over the last few years the Government has undertaken a programme of environmental improvement works on some of the larger Government residential estates. These works have been aimed at improving the physical environment of the estates and to improving car parking arrangements. The Development and Planning Commission will encourage the Government to continue this programme of improvements through the Plan period.

Off-street car parking in residential estates

4.24 Many of Gibraltar's residential estates lack adequate off-street car parking spaces resulting in a negative effect on the environment generally, traffic congestion and may have an adverse effect on residents and visitors.

POLICY H9 – OFF-STREET CAR PARKING IN RESIDENTIAL ESTATES

THE PROVISION OF ADDITIONAL OFF-STREET CAR PARKING WITHIN OR ADJACENT TO EXISTING RESIDENTIAL ESTATES WILL BE REVIEWED.

Gibraltar Neanderthals

5 EMPLOYMENT

Introduction

- 5.0 Gibraltar's economy has undergone significant structural changes over the last two decades. It has moved from an economy very much based on the presence of the MOD to a service economy based on the financial sector, tourism and shipping. These structural changes have come about mainly due to the downsizing of the MOD presence in Gibraltar, the re-opening of the land frontier with Spain and the consequent impact on tourism and the promotion of Gibraltar as an international finance centre.
- 5.1 During the early 1990s the total number of jobs in the economy declined from just over 14,900 jobs in October 1990 to just over 12700 in October 1995. Since then the number of jobs have gradually increased with the figure for October 2008 being 20,509¹. Of these some 5967² were held by cross frontier workers.

Economic development

- 5.2 The Development and Planning Commission's aim is to continue to develop and diversify the economy through making optimum use of land, labour and capital resources, together with encouraging private sector involvement in new projects.
- 5.3 In addition to specific policies and proposals contained in Part II of this Plan or the Old Town Plan, the following general policies shall apply.

POLICY E1 – ECONOMIC DEVELOPMENT

DEVELOPMENT PROPOSALS THAT WILL MAINTAIN, STRENGTHEN AND DIVERSIFY GIBRALTAR'S ECONOMIC BASE SHALL BE ENCOURAGED.

Office development

- 5.4 There is a demand for office floorspace to serve the needs of a range of office uses including financial and investment institutions and other businesses. During the 1991 Plan period significant new office floorspace was added to the stock, most notably at Europort where 47,000 sq metres was provided.
- 5.5 Site-specific proposals for further office development are included within Part II of this Plan.

Small scale office development

- 5.6 In addition to the demand for modern flexible accommodation there is also demand for smaller office accommodation, particularly within the town area. Proposals for such office

¹ Abstract of Statistics, 2008

² Employment Survey, October 2008

development often involve the conversion of existing buildings that has benefits in terms of sustainable development through the re-use of existing buildings, and often provides the opportunity for refurbishment of older buildings with the consequent improvement to the built environment. However, such uses must be compatible with the surrounding uses.

POLICY E2 – OFFICE DEVELOPMENT

PROPOSALS FOR SMALL SCALE OFFICE DEVELOPMENT WILL NORMALLY BE GRANTED PERMISSION PROVIDED THAT THERE IS NO SIGNIFICANT DETRIMENTAL EFFECT ON SURROUNDING USES.

- 5.7 Proposals for conversion of existing buildings in the Old Town for office development will be considered in the policy context of the Old Town Plan.

Light industrial/storage/distribution units

- 5.8 There is a constant demand for light industrial units to accommodate a range of such uses including light manufacturing processes, small workshops, starter units as well as storage and distribution units. During the 1991 plan period a number of developments have been carried out:

Name	No of Units	Total Floorspace (m²)
New Harbours	107	261,280
Europa Business Centre	26	63,917
Lathbury Barracks Industrial Park	28	17,633
Eaton Park	27	1,392
Governor's Cottage Camp	39	12,124
North Mole Industrial Park	7	2,262

- 5.9 There is a need to accommodate future demand and the need for additional premises will be kept under review during the current Plan period and the development of suitable sites will be encouraged.

POLICY E3 – LIGHT INDUSTRIAL AND STORAGE

THE PROVISION OF LIGHT INDUSTRIAL AND STORAGE UNITS SHALL BE ENCOURAGED ON SUITABLE SITES WHERE:

- A) ACCESS AND PARKING ARRANGEMENTS ARE SATISFACTORY; AND*
- B) THERE IS NO UNACCEPTABLE DETRIMENTAL EFFECT ON THE AMENITIES OF NEIGHBOURING OCCUPIERS.*

Relocation of existing industrial/storage uses

5.10 For historic reasons there exist industrial/storage uses located within built up areas, particularly the town area. These are normally characterised by very constrained sites, adjacent to residential properties and where vehicular access through congested and narrow streets is very difficult. The Plan therefore aims to encourage the re-location of these sites away from residential areas to more suitable sites. Furthermore, proposals for the expansion of such uses in-situ are likely to exacerbate existing problems of traffic congestion and disturbance to adjacent residential uses and therefore proposals for such expansion shall not normally be considered favourably.

POLICY E4 – RELOCATION OF INDUSTRIAL/STORAGE USES

THE RELOCATION OF EXISTING INDUSTRIAL/STORAGE USES THAT ARE INAPPROPRIATELY SITED TO MORE SUITABLE LOCATIONS SHALL BE ENCOURAGED.

PROPOSALS FOR THE EXPANSION OF EXISTING INDUSTRIAL/STORAGE USES THAT ARE INAPPROPRIATELY LOCATED WILL NOT NORMALLY BE GRANTED PERMISSION.

Proposals for new industrial buildings, extensions and changes of use

5.11 New industrial buildings or redevelopment or extension of existing industrial buildings should be of a design and layout that promotes a high quality environment, minimise the impact on adjacent uses and the environment generally and maximises the use of the site.

POLICY E5 – NEW, REDEVELOPED OR EXTENDED INDUSTRIAL BUILDINGS

PROPOSALS FOR NEW INDUSTRIAL BUILDINGS, OR REDEVELOPMENT OF, OR EXTENSIONS TO, EXISTING INDUSTRIAL BUILDINGS WILL NORMALLY BE PERMITTED PROVIDED THAT:

- A) THE DESIGN IS OF A STANDARD THAT PROMOTES A HIGH QUALITY ENVIRONMENT;*

- B) SATISFACTORY ACCESS, CAR PARKING AND SERVICING AREAS CAN BE PROVIDED;**
- C) THERE IS NO SIGNIFICANT ADVERSE IMPACT ON NEARBY OCCUPIERS AND THE ENVIRONMENT GENERALLY; AND**
- D) WHERE APPROPRIATE, THE PROPOSAL INCORPORATES A SATISFACTORY LANDSCAPING SCHEME.**

6 TOURISM

Introduction

- 6.0 Tourism has a vital role to play in Gibraltar's economy. Tourism supports a wide range of local facilities such as shops, restaurants, bars, transport, etc, that otherwise may not be viable.
- 6.1 The re-opening of the land frontier between Gibraltar and Spain firstly for pedestrians in 1982 and then for vehicular traffic in 1985, had a massive impact on the tourism sector. Gibraltar became more accessible to a much wider market and day-trippers from the Costa Del Sol became a particularly important source of tourists. Gibraltar received, in 2008, some 9.6 million visitors¹. This compares to 140,000 in 1970, 132,000 in 1981 and some 4 million in 1991. Some 95% came across the land frontier, the remainder came by sea (3%) or by air (2%)¹.
- 6.2 The vast majority of visitors to Gibraltar are day visitors. However, hotel occupancy levels have been gradually increasing since 1996 with an occupancy level of 60.6% in 2008, and an average length of stay of 3² nights.
- 6.3 It is estimated that tourism was responsible for some 20-25% of the GDP in 2002. The Input-Output Study (undertaken by Bournemouth University)³ estimated that the tourism sector accounted for 1853 direct Full Time Equivalent jobs (FTE), and when the indirect effect (employment occurring in other sectors as a result of the demand generated by the tourism sector) is taken into account, it accounted for 2760 FTEs. In 2008⁶ a total of some £247 million was spent by tourists in Gibraltar, this compares to tourist spending of some £75 million in 1991, an increase of almost 330% since the last Plan was published. Of the total tourist spend in 2008 almost 80% was made by excursionists from Spain⁶, emphasising the importance of this source of tourism.
- 6.4 Gibraltar's attraction as a tourist destination can be classified into:
- Its unique historical and cultural interest;
 - Its shopping opportunities; and
 - Its increasing importance for niche tourism, e.g. scuba diving, weddings, sailing.
- 6.5 The Government is committed to developing Gibraltar's tourist potential further by:
- Developing strategies aimed at extending the length of stay of visitors, whether these are day trippers, short break or other visitors;
 - Consolidating existing, and promoting Gibraltar to new, source markets;
 - Encouraging the provision of further hotel accommodation and diversifying the type of accommodation available;

¹ Tourism Survey, 2008 (visitor arrivals by land include non-Gibraltarian frontier workers)

² Hotel Occupancy Survey, 2008

³ Input-Output Study of Gibraltar, ProfsJ Fletcher & S Wanhill, Bournemouth University, 2003

- Promoting Gibraltar as a destination for specialist tourism e.g. conferences, weddings, scuba diving, etc.
- Investment in tourist attractions – e.g. recent investments include lighting and sound system at St Michael’s Cave; ‘bringing to life’ Upper Galleries; restoration of the Tower of Homage.
- Investment in tourism infrastructure –e.g. cruise liner terminal, coach park, ferry terminal.

6.6 Major schemes to improve facilities and attractions for tourists have taken place over the last few years and include:

- Pedestrianisation and environmental improvement of Main Street and its side streets;
- Cruise terminal;
- Coach park and associated facilities;
- Ferry terminal;
- Air terminal refurbishment and extension;
- Land frontier building refurbishment; and
- Improvements to major tourist sites

6.7 Details of major schemes to improve facilities and tourist attractions are given in Part II of this Plan. More general policies aimed at contributing towards the achievement of the objectives stated above are set out in the remainder of this chapter.

Visitor Management Plan

6.8 Given Gibraltar’s limited size, the volume of tourists, the environmental sensitivity of parts of the Rock and its restricted road network, it is important to ensure that Gibraltar’s carrying capacity for visitor numbers at any one time is not exceeded. The Development and Planning Commission will therefore encourage the relevant Government departments and agencies to keep under review total visitor numbers and the methods of monitoring these, to ensure that Gibraltar’s carrying capacity is not exceeded.

POLICY T1 – CARRYING CAPACITY

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE THE RELEVANT GOVERNMENT DEPARTMENTS/AGENCIES TO KEEP UNDER REVIEW TOTAL VISITOR NUMBERS AND THE METHODS OF MONITORING THESE.

Safeguarding tourist attractions

6.9 The importance of tourism to Gibraltar is such that it is vital to ensure that new development does not have a detrimental effect on the tourist product.

POLICY T2 – PROTECTION OF TOURIST ATTRACTIONS

PERMISSION WILL NOT NORMALLY BE GRANTED FOR DEVELOPMENT PROPOSALS THAT WILL HAVE A SERIOUS DETRIMENTAL EFFECT ON RECOGNISED TOURIST ATTRACTIONS.

Major tourist development

- 6.10 Clearly proposals for major new tourist attractions could have a positive benefit in terms of attracting people to Gibraltar. However, this has to be balanced against the impact on sites of environmental or heritage importance, and the potential impact on existing uses and residents in the area. Permission will normally be granted provided that the Development and Planning Commission is satisfied that the benefits of the proposed development outweigh any disadvantages.
- 6.11 By their very nature such proposals are likely to attract significant numbers of visitors and it is therefore important that such sites are easily accessible by foot or by public transport in order to minimise traffic generation.

POLICY T3 – MAJOR TOURIST DEVELOPMENT

PROPOSALS FOR MAJOR NEW TOURIST ATTRACTIONS WILL ONLY BE GRANTED PLANNING PERMISSION WHERE IT CAN BE SHOWN THAT:

- A) THERE IS NO SIGNIFICANT ADVERSE VISUAL IMPACT;**
- B) THERE IS NO SIGNIFICANT ADVERSE EFFECT ON ANY STATUTORY PROTECTED AREA, AREA OF NATURE CONSERVATION INTEREST OR OF HERITAGE INTEREST;**
- C) THERE IS NO SIGNIFICANT ADVERSE EFFECT ON NEIGHBOURING USES OR THE LOCAL ENVIRONMENT BY REASON OF VISUAL INTRUSION, NOISE OR OTHER AMENITY CONSIDERATIONS;**
- D) THE PROPOSED DEVELOPMENT IS ACCESSIBLE BY FOOT AND/OR PUBLIC TRANSPORT; AND**
- E) THERE IS NO SIGNIFICANT ADVERSE EFFECT IN TERMS OF TRAFFIC GENERATION, AND THAT CAR PARKING REQUIREMENTS, IF APPROPRIATE, CAN BE SATISFIED.**

Hotels

- 6.12 There are a number of existing proposals in the pipeline for new hotel accommodation. Significant extensions are planned for The Elliott and Caleta hotels, new hotels are proposed at the site of Buena Vista and a site close to the airport and the potential for a number of new hotels is being considered at the Eastside reclamation.

6.13 The implementation of all these proposals will contribute significantly towards meeting demand. However, circumstances change over time and it will therefore be essential to continuously monitor the demand for hotel accommodation and take appropriate action where necessary.

POLICY T4 - HOTELS

DEMAND FOR FURTHER HOTELS WILL BE KEPT UNDER REVIEW AND SUITABLE SITES WILL BE IDENTIFIED IF NECESSARY.

Other tourist accommodation

6.14 To encourage overnight tourists and to make Gibraltar attractive to a wider market, it is important that a choice of accommodation is available to meet different budgets. Proposals to provide alternative accommodation to hotels will normally be favourably considered provided that they can be accommodated without any significant adverse impacts on surrounding uses. It is anticipated that such proposals will come about through proposals to convert existing buildings. This can often have a positive benefit in terms of restoration of Gibraltar's older buildings and will be encouraged.

POLICY T5 – TOURIST ACCOMMODATION

PROPOSALS FOR NEW TOURIST ACCOMMODATION OTHER THAN HOTELS WILL NORMALLY BE FAVOURABLY CONSIDERED PROVIDED THAT:

- A) THE PROPOSAL WILL NOT UNREASONABLY AFFECT THE CHARACTER AND AMENITY OF THE AREA;***
- B) WILL NOT HAVE A SIGNIFICANT ADVERSE IMPACT ON NEIGHBOURING USES AND THE LOCAL ENVIRONMENT; AND***
- C) WILL NOT LEAD TO UNACCEPTABLE PROBLEMS OF TRAFFIC GENERATION, CAR PARKING OR SAFETY.***

7 RETAILING

Introduction

- 7.0 The 1991 Plan policies have been successful in protecting the Town area as the main shopping area. During the late 1980s and the 1990s the high demand for office accommodation was seen as a threat to the shopping area. However, the policies of the 1991 plan for the town area, together with the development of the Europort reclamation area were effective in relieving the pressure on the town area and thereby protecting the shopping area.
- 7.1 Gibraltar acts as both an important local centre as well as a regional shopping centre, providing a range of small specialist shops as well as increasingly, multiple stores. As well as meeting the requirements of the local population retailing in Gibraltar is also heavily dependent on the tourist market. At the higher end of the spending spectrum Gibraltar is an attractive shopping centre for cruise visitors who tend to purchase high value goods, particularly electronic equipment and perfumery. At the lower end of the spending spectrum are the day visitors who although spend less per person are nevertheless important to the sector because of the large numbers who come to Gibraltar, many purely for shopping purposes.
- 7.2 The retail sector is therefore an important part of Gibraltar's economy with the sector responsible for just over 10% of the GDP (with the wholesale sector contributing another 10% to GDP)¹. The wholesale and retail sector account for 2878 employee jobs representing 14% of the total employee jobs in 2008.

Gibraltar's role as a shopping centre

- 7.3 Gibraltar's main shopping area is centred on the Old Town, along Main Street, Irish Town, Governor's Street and Engineer Lane. Other smaller local centres occur outside the main area, e.g. Watergardens, Marina Bay/Ocean Village, Queensway Quay and within some of the residential estates. Over the last few years limited retailing activity has taken place within some of the industrial estates, particularly at New Harbours. As would be expected larger supermarkets exist outside the Old Town, namely at Devil's Tower Road, New Harbours and Europort (superstore).
- 7.4 Gibraltar is well served by restaurants, bars and clubs that are concentrated in the Old Town and at the marinas at Marina Bay/Ocean Village and Queensway Quay. These businesses contribute towards the local economy and are important in the quality of life for residents as well as contributing towards the attractiveness of Gibraltar for tourists. Such businesses are normally located in close proximity to residential premises and potential problems such as noise disturbance and odours need to be taken into account and where possible appropriate mitigation measures should be implemented.
- 7.5 Since 1991, significant improvements have been made to the environment of the town area. These include the pedestrianisation and environmental improvement of Main Street and many of its side streets, the environmental improvement of Casemates Square and

¹ Input-Output Study of Gibraltar, Profs J Fletcher & S Wanhill, Bournemouth University, 2003

the development of Casemates Barracks as a restaurant/bar and shopping area, and the improvement and appearance of numerous privately owned buildings in the area which has been supported by the Government's Façade Tax Relief scheme. As set out in the Environment chapter, the aim is to continue the policy of Environmental Improvement. In addition, detailed policies and proposals are set out in the Old Town Plan that promote the improvement of the environment of the Old Town. These policies and proposals are inter-related with the policies on retailing and represent a comprehensive approach to the planning of Gibraltar.

- 7.6 This Plan therefore aims to maintain the primary retail role of Main Street and its surrounding area thereby maintaining the vitality and viability of the shopping area as a whole.

POLICY R1 – MAINTENANCE OF ROLE OF OLD TOWN

THE ROLE OF THE OLD TOWN AS THE PRINCIPAL RETAIL CENTRE WITHIN GIBRALTAR SHALL BE MAINTAINED AND ENHANCED.

RETAIL DEVELOPMENT PROPOSALS WITHIN THE OLD TOWN WILL BE CONSIDERED IN ACCORDANCE WITH THE POLICIES AND PROPOSALS OF THE OLD TOWN PLAN.

Superstores and other large retail outlets

- 7.7 The Old Town, comprising narrow streets and heavily built up and with restricted access is not a suitable location for superstore or other large retail outlets. It may be possible to locate such uses outside the Old Town on sites that are suitably accessible by car, public transport, on foot and bicycle, and which will not have a detrimental effect on the function of the Old Town as a shopping centre.

POLICY R2 – SUPERSTORES AND OTHER LARGE RETAIL OUTLETS

PROPOSALS FOR SUPERSTORES AND OTHER LARGE RETAIL UNITS OUTSIDE THE OLD TOWN WILL NORMALLY BE GRANTED PERMISSION PROVIDED:

- A) THE PROPOSAL WOULD BE CONSISTENT WITH THE DETAILED POLICIES FOR THE ZONE;***
- B) THE SITE IS EASILY ACCESSIBLE BY CAR, PUBLIC TRANSPORT, WALKING AND BICYCLE;***
- C) CAR PARKING PROVISION IS MADE IN ACCORDANCE WITH THE REGULATIONS AND SATISFACTORY SECURE CYCLE PARKING PROVISION IS MADE;***
- D) THERE IS NO SIGNIFICANT DETRIMENTAL EFFECT ON RESIDENTIAL AMENITIES; AND***
- E) THERE IS NO SIGNIFICANT DETRIMENTAL EFFECT ON THE VITALITY AND VIABILITY OF THE OLD TOWN AS THE PRIMARY SHOPPING AREA.***

Local shopping Centres

- 7.8 Local shopping centres have a vital role to play in meeting the day-to-day needs of local residents and thereby reduce the need to travel elsewhere, thus contributing towards the aim of reducing traffic congestion. Such provision can often be made part of new development projects and should be considered at an early stage in the design process.

POLICY R3 – LOCAL SHOPPING CENTRES

THE DEVELOPMENT OF LOCAL SHOPPING CENTRES WITHIN RESIDENTIAL AREAS SHALL BE ENCOURAGED. THERE WILL BE A PRESUMPTION IN FAVOUR OF THE RETENTION OF EXISTING SHOPS.

Take away outlets

- 7.9 Take away outlets include both hot and cold food take aways. Such businesses are important in serving the needs of both locals and visitors. Apart from the Old Town, demand also exists in areas where office development has taken place, such as Europort, where they attract the office worker market. However, take aways can often cause nuisance to nearby residents by virtue of noise and odours, and it is therefore important that where such a use is proposed adequate mitigation measures are taken to prevent any significant nuisance to nearby residents occurring. Such measures should be taken into account at an early stage since if the measures themselves cause environmental problems, for example the location of a steel flue on the frontage of a building, then permission would not normally be granted.

POLICY R4 – TAKE AWAYS

PERMISSION FOR TAKE AWAYS WILL ONLY BE GRANTED WHERE:

- A) THERE IS NO SIGNIFICANT ADVERSE EFFECT ON THE APPEARANCE OF THE BUILDING OR CHARACTER OF THE AREA;***
- B) THERE IS NO SIGNIFICANT ADVERSE EFFECT ON THE AMENITIES OF NEARBY OCCUPANTS; AND***
- C) IT WILL NOT RESULT IN UNACCEPTABLE TRAFFIC, CAR PARKING OR SAFETY PROBLEMS.***

Retailing within industrial estates

- 7.10 Industrial estates in Gibraltar traditionally have a mix of uses and are not limited to industrial activities only. Uses would typically include storage, distribution and warehousing, industrial, commercial and some retail particularly of bulk items such as furniture and DIY goods. Proposals for limited retail development in such areas is considered acceptable provided

that the use can be satisfactorily accommodated without detriment to other users of the area, adequate parking can be made available and there is no significant detrimental effect on the vitality and viability of the Old Town as the primary shopping area.

POLICY R5 – RETAIL USES IN INDUSTRIAL ESTATES

PROPOSALS FOR LIMITED RETAIL USES WITHIN INDUSTRIAL ESTATES WILL NORMALLY BE PERMITTED WHERE:

- A) THERE IS NO SIGNIFICANT DETRIMENTAL IMPACT ON THE AMENITY OF NEARBY OCCUPIERS;***
- B) ADEQUATE CAR PARKING PROVISION CAN BE MADE;***
- C) THERE IS NO SIGNIFICANT DETRIMENTAL EFFECT ON THE APPEARANCE OR CHARACTER OF THE AREA; AND***
- D) THERE IS NO SIGNIFICANT DETRIMENTAL EFFECT ON THE VITALITY AND VIABILITY OF THE OLD TOWN AS THE PRIMARY SHOPPING AREA.***

8 TRANSPORT

Introduction

- 8.0 Travel to, from and within Gibraltar, in all its forms, is an important consideration in planning terms. There is clearly an inter-relationship between land use and transport and this Plan aims to accommodate Gibraltar's needs in a balanced way.
- 8.1 Factors to be taken into account in any consideration of transport issues in Gibraltar include:
- The limited amount of road space available with parts of the network, principally within the Old Town, characterised by narrow and often steep streets;
 - In 2008 there were some 23,500 licensed vehicles in Gibraltar¹.
 - The heavy reliance on the private motor car for all trips, many of which are for short distances;
 - The impact of the massive increase in the number of visitors arriving by both land and air since the land frontier opened fully in 1985. In 1984 the number of visitors by land was 477,000, by 2008 it was 9.6 million².
 - The lack of off-street car parking facilities, particularly within the Old Town, but also within much of the surrounding area;
 - The implications of major developments on the public highway network.
- 8.2 The Development and Planning Commission welcomes Government policy to continue to monitor all issues relating to transport and to undertake improvements where these are considered necessary.
- 8.3 Set out below are various transport-related issues that are considered relevant for inclusion in the Plan.

Transport Study

- 8.4 The 1991 Plan indicated that a comprehensive transport study would be undertaken and a programme of traffic proposals would be established based on the results of this study. Although a comprehensive study has not yet been undertaken a number of traffic proposals have been formulated and implemented during the life of the 1991 Plan. The Development and Planning Commission however, supports the preparation of a comprehensive transport study that would provide the proper context for planning future programmes and ensuring an integrated approach to the issue of transport.

Alternative means of transport

- 8.5 The Plan's strategic principle in relation to transport is to facilitate and encourage alternative means of transport including the use of public transport, and to cater for the needs of private transport where appropriate. In relation to alternative means of transport the Development

¹ Abstract of statistics 2008

² Tourist Survey Report, 2008

and Planning Commission will continue to encourage proposals that will contribute to this aim and will encourage the Government to consider, at the strategic level, ways in which alternative means of transport can be promoted.

POLICY TR1 – PROMOTION OF ALTERNATIVE MEANS OF TRANSPORT

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE PROPOSALS THAT PROMOTE ALTERNATIVE MEANS OF TRANSPORT TO PRIVATE TRANSPORT. THE DEVELOPMENT AND PLANNING COMMISSION SHALL ALSO ENCOURAGE THE GOVERNMENT TO CONSIDER WAYS IN WHICH ALTERNATIVE MEANS OF TRANSPORT CAN BE PROMOTED.

Proposed new road schemes

8.6 The following are proposed road schemes. These are discussed in more detail in the relevant sections of Part II and the Old Town Plan.

- Link road from Europort to Coaling Island.
- Widening and improvement of Devil's Tower Road.
- Link road to airport and land frontier.

Highway considerations for new development

8.7 Proposals for new development frequently have an impact on the local traffic situation including matters of safety for all users – pedestrians, vehicles and cyclists. It is important to ensure that new development meets all relevant safety standards and takes into account the traffic requirements of the proposed development. Car parking requirements for new development are set out in the Town Planning (Building Development Control) Regulations.

POLICY TR2 – HIGHWAY CONSIDERATIONS

PROPOSALS FOR NEW DEVELOPMENT THAT ARE OTHERWISE ACCEPTABLE WILL BE GIVEN FAVOURABLE CONSIDERATION PROVIDED THAT:

- A) WHERE RELEVANT, APPROPRIATE CYCLE PARKING PROVISION IS PROVIDED WITHIN THE SITE; ;***
- B) ANY NEW ROAD LAYOUT INCLUDING ACCESS ARRANGEMENTS ARE DESIGNED TO PROVIDE SAFE CONDITIONS FOR ALL USERS (CYCLISTS, PEDESTRIANS AND VEHICLES) AND MEET THE REQUIREMENTS OF THE HIGHWAYS DEPARTMENT; AND***
- C) CAR PARKING PROVISION HAS BEEN MADE IN COMPLIANCE WITH THE CAR PARKING STANDARDS AS CONTAINED IN THE REGULATIONS UNLESS THE DEVELOPMENT AND PLANNING COMMISSION AGREES TO THEIR RELAXATION.***

Construction Activities

8.8 During the construction stage of new developments there has been a noticeable trend over the last few years for contractors to appropriate public highway land, whether this be footpaths or parts of the roadway, in order to facilitate their construction activities. The Development and Planning Commission is concerned with this trend as it frequently results in major disruption and inconvenience to the general public by disrupting vehicular and pedestrian traffic flows. Applicants should give early consideration to the proposed method of construction, their plant siting requirements and material storage, so as to avoid the need to use land outside the application site. The Development and Planning Commission will normally require that all construction activities shall be restricted to the application site itself. In pursuance of this aim, the Development and Planning Commission shall seek the support of other relevant authorities involved in the construction process.

POLICY TR3 – CONSTRUCTION ACTIVITIES

IN GRANTING PERMISSION FOR NEW DEVELOPMENT THE DEVELOPMENT AND PLANNING COMMISSION WILL NORMALLY REQUIRE THAT CONSTRUCTION ACTIVITIES ARE LIMITED TO THE SITE OF THE APPLICATION.

8.9 Construction activity frequently involves the movement of HGVs and site plant and equipment within the local road network. Such vehicular movements, due to their low speed, often result in traffic congestion and where these movements coincide with peak traffic periods can result in significant traffic delays. The Development and Planning Commission will therefore encourage the relevant authorities to take the necessary measures to address this issue.

Public car parking

8.10 There is a general problem in Gibraltar with private car parking. The sheer number of vehicles, coupled with dense development, narrow streets and the lack of on site car parking all contribute towards the problem. This problem is exacerbated by the large number of tourist vehicles entering Gibraltar on a daily basis. In 2008 this amounted to an average of some 6900 vehicles per day³. The problem is most acute in the Town area. There are a number of public car parks around the town area the biggest ones being:

- Alameda Grand Parade;
- Commonwealth Parade;
- Queensway (ex football pitch);
- ICC Car park;
- Landport Ditch.

³ Tourist Survey Report 2008

8.11 Additional car parking has recently been provided at:

- Willis' Road;
- Sandpits;
- New Harbours.

POLICY TR4 - CAR PARKING

THE PROVISION OF PUBLIC CAR PARKING SHALL BE KEPT UNDER REVIEW

Provision of car parking for new development

8.12 New development proposals will often require the provision of associated car parking. The design solution often used is to provide car parking at ground floor with the remainder of the development above. The Development and Planning Commission is concerned that such a solution often results in a dead and unattractive frontage at ground level, and in some areas may be totally out of character with the streetscene. As set out in the General Design and Standards section of Part I of the Plan under the sub-section dealing with the 'Public Realm', the Development and Planning Commission wishes to encourage a high quality public realm with amongst other characteristics, developments containing activity-generating uses at ground floor. Dead frontages are not considered good design and the Development and Planning Commission encourages alternative solutions to be considered. These may involve the location of parking to the rear of ground floor uses or the provision of underground car parking.

POLICY TR5 – PROVISION OF CAR PARKING FOR NEW DEVELOPMENT

PERMISSION WILL NOT NORMALLY BE GRANTED FOR DEVELOPMENTS THAT INCORPORATE CAR PARKING AT GROUND LEVEL THAT RESULT IN DEAD FRONTAGES. THE DEVELOPMENT AND PLANNING COMMISSION REQUIRES CAR PARKING TO BE LOCATED SO AS NOT TO CREATE SUCH FRONTAGES AND IN PARTICULAR, WILL SEEK THE PROVISION OF UNDERGROUND CAR PARKING IN APPROPRIATE SITES.

Loss of public on-street car parking

8.13 On-street car parking for use by the general public is an essential source of parking and in many parts of Gibraltar is the only car parking available to residents and visitors in the area. The Development and Planning Commission therefore wishes to ensure the retention of such parking wherever possible.

8.14 Planning is about protecting the public interest against the private interest. This is frequently the central issue when considering proposals for development that would result in the loss of public on-street car parking in favour of a private development. The Development and Planning Commission would not normally approve proposals where there is a net loss of car parking. Thus, in the case of an individual who wishes to create a vehicular access

to a proposed garage or perhaps a yard for the parking of a car, and where as a result of the need for clear access to this area from the public highway together with the necessary visibility splays to ensure safe access and egress, means that more public car parking spaces will be lost than private spaces shall be gained, it is unlikely to receive permission.

- 8.15 In exceptional cases, there may be other considerations that the Development and Planning Commission need to take into account when considering such proposals. In particular, whilst a proposal may result in a net loss of car parking, this may be outweighed by environmental benefits such as a significant improvement in the built environment or perhaps the beneficial re-use of an existing building. However, for an exception to be made there will need to be very clear evidence of the benefits that would justify the exception to the policy.

POLICY TR6 – LOSS OF PUBLIC ON-STREET CAR PARKING

THERE WILL BE A PRESUMPTION AGAINST THE LOSS OF PUBLIC ON-STREET CAR PARKING. ANY PROPOSALS THAT WILL RESULT IN A NET LOSS OF PARKING WILL NORMALLY BE REFUSED. ONLY IN VERY EXCEPTIONAL CASES, WHERE THERE ARE CLEAR BENEFITS THAT OUTWEIGH THE PRESUMPTION AGAINST, WOULD SUCH DEVELOPMENT BE PERMITTED.

Parking within underground structures

- 8.16 The Development and Planning Commission wishes to encourage the use of redundant underground structures such as tunnels and air raid shelters for car parking purposes wherever possible. However, any proposals would need to be carefully assessed to ensure that there is no significant adverse effect on nature conservation interests, heritage or cultural assets and that safe vehicular access and egress is possible.

POLICY TR7 – PARKING PROPOSALS IN UNDERGROUND STRUCTURES

PROPOSALS FOR CAR PARKING WITHIN UNDERGROUND STRUCTURES WILL NORMALLY BE FAVOURABLY CONSIDERED PROVIDED THAT:

- A) THERE IS NO SIGNIFICANT ADVERSE EFFECT ON NATURE CONSERVATION INTERESTS OR HERITAGE AND CULTURAL ASSETS; AND***
B) ADEQUATE VEHICULAR ACCESS CAN BE PROVIDED.

Parking for the disabled

- 8.17 The requirements of disabled persons needs to be taken into account in the provision of car parking and special provision in public car parks shall be encouraged.

POLICY TR8 – PUBLIC PARKING PROVISION FOR DISABLED PERSONS

SPECIAL PROVISION SHALL BE MADE IN NEW PUBLIC CAR PARKS FOR THE SOLE USE OF DISABLED PERSONS.

- 8.18 Private development proposals should take into account the needs of the disabled in the design of their car parking provision.
- 8.19 In addition to providing spaces for disabled persons within public car parks, designated spaces are also provided on-street and within residential estates where a need has been identified.
- 8.20 The European 'Blue Badge' scheme for disabled persons has recently been introduced in Gibraltar and as part of this a review of the provision of parking bays for the disabled throughout Gibraltar is to be undertaken. As a result of the review provision may be increased, particularly within the town area.

POLICY TR9 – PARKING PROVISION FOR DISABLED PERSONS IN NEW DEVELOPMENT

IN CONSIDERING DEVELOPMENT PROPOSALS ENCOURAGEMENT SHALL BE GIVEN TO THE INCORPORATION OF PARKING PROVISION FOR DISABLED PERSONS WITHIN THE PROPOSED PARKING SCHEME FOR THE DEVELOPMENT.

Cycling routes

- 8.21 Throughout Europe cycling, both as a recreational activity and a means of transport, is gaining in popularity. There are clear environmental benefits in cycling, but in addition there are general health benefits associated with it, and the provision of infrastructure and facilities is relatively inexpensive.
- 8.22 As a means of transport in Gibraltar, cycling is little used. The 2001 census for example, shows that less than 1% of people travelled to work by bicycle. On the face of it Gibraltar would appear to be an ideal location for cycling since the distance involved between destinations tends to be short and large parts of Gibraltar may be reached without having to overcome steep gradients. This Plan therefore aims to encourage cycling as a means of transport, and will encourage the provision of safe routes and facilities, and will require that in new development account be taken of the cycling requirements.

POLICY TR10 – CYCLING ROUTES

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE CYCLING AS A MEANS OF TRANSPORT. WHERE THE CIRCUMSTANCES ALLOW, THE PROVISION OF SAFE ROUTES AND FACILITIES SHALL BE ENCOURAGED.

Cycling facilities

- 8.23 The provision of cycling facilities is an important aspect in the success or otherwise in encouraging cycling as a means of transport. When cyclists reach their destination whether it be their office, school or shopping area, they require secure parking facilities. There is

a wide range of such parking facilities now available in the market ranging from simple functional designs to more innovative and themed designs for stands and racks, which can be both floor and wall mounted.

- 8.24 The Development and Planning Commission will encourage the Government to investigate the potential for the provision of secure parking facilities in existing public car parks and other suitable public areas. In designing new public car parks such facilities should be taken into account.

POLICY TR11 – CYCLE PARKING FACILITIES

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE THE GOVERNMENT TO INVESTIGATE THE POTENTIAL FOR PROVIDING SECURE CYCLE PARKING FACILITIES IN EXISTING PUBLIC CAR PARKS AND OTHER PUBLIC AREAS. SUCH FACILITIES SHALL BE INCORPORATED INTO THE DESIGN OF ANY NEW PUBLIC CAR PARKS.

PERMISSION FOR NEW OFFICE DEVELOPMENTS WILL ONLY BE GRANTED WHERE ADEQUATE PROVISION HAS BEEN MADE FOR SECURE PARKING FACILITIES EITHER WITHIN THE SITE OR NEARBY.

Coach Travel

- 8.25 Many of Gibraltar's tourists arrive by coach. Coach arrivals have seen a significant increase from 6610 in 1985 to just over 8700 in 2008⁴. In 2000 a new coach park situated at Waterport came into operation. This park currently has sufficient capacity to accommodate the demand. However, this needs to be kept under review to ensure that adequate facilities are available to meet the demand for coach travel.

POLICY TR12 – COACH PARK

THE OPERATION OF THE COACH PARK SHALL BE KEPT UNDER REVIEW AND APPROPRIATE ACTION TAKEN TO ENSURE THAT THE REQUIREMENTS OF COACH TRAVEL ARE ADEQUATELY MET.

Gibraltar Airport

- 8.26 Gibraltar Airport is an MOD airport and is jointly used for military and civilian flights. The Cordoba Agreement of September 2006 and to which the Gibraltar, British and Spanish Governments are all parties, allows for the enhanced use of the airport. The practical consequence of this aspect of the agreement is the increased use of the airport and associated expansion of existing ground facilities. Further details are given in the relevant section of Part II of this Plan.

⁴ Tourist Survey Report 2008

GIBRALTAR DEVELOPMENT PLAN

8.27 Gibraltar Airport is safeguarded in order to ensure that its operation and development is not inhibited by:

- a) buildings, structures, erections or works which infringe protected surfaces, obscure approach lights, have the potential to impair the performance of navigation aids or otherwise affect the safe operation of the airport;
- b) by lighting which has the potential to distract pilots; or
- c) by developments which have the potential to increase the number of birds or the bird hazard risk.

8.28 Proposals that are likely to affect the safe operation of Gibraltar Airport need to be assessed, and an aeronautical study may be required to be undertaken by the developer. The Development and Planning Commission shall take into consideration the results of any such assessment, including the views of the relevant airport authority, in reaching a decision on a proposed development that is subject to such an assessment. However, it is unlikely that development proposals that contravene the safeguarding requirements and are considered a serious risk to aeronautical safety, will be granted planning permission.

POLICY TR13 – GIBRALTAR AIRPORT

PLANNING PERMISSION WILL NOT BE GRANTED FOR DEVELOPMENT THAT CONTRAVENES THE SAFEGUARDING REQUIREMENTS FOR GIBRALTAR AIRPORT AND ARE CONSIDERED A SERIOUS RISK TO AERONAUTICAL SAFETY.

9 SOCIAL AND COMMUNITY

Introduction

- 9.0 The provision of education, health, religious and other community facilities all contribute to the well being of the community as a whole. Whilst the delivery of services in these areas is the responsibility of various Government agencies the land use requirements are of relevance to the Development Plan.
- 9.1 In general terms proposals for such facilities will normally be supported provided that they are appropriately located and comply with the other relevant policies of this Plan.

Education

- 9.2 Educational facilities are a significant land user. There are a total of 6 first schools, 4 middle schools, and 2 secondary schools. In addition are the College of Further Education, the Bleak House Training Institute, St Martin's Special School and a number of Government and private nurseries.
- 9.3 Over the last few years there have been changes in both the total number of pupils and their distribution. The development of residential units on the Westside reclamation that took place in the '90s had a marked effect on the distribution of pupils. As a result schools in the area have become overcrowded, namely Bishop Fitzgerald (Middle), Governor's Meadow (First) and St Paul's (First). An extension to St Paul's school at Varyl Begg Estate has recently been constructed to meet demand from the Westside area thereby reducing the pressure on Governor's Meadow, and to accommodate the expected demand from proposed development at Waterport Terraces (see Part II). Part II of this Plan includes a proposal for a new first/middle school to be located in the Queensway area. This will effectively result in the re-siting of St Mary's First school from Town Range, and the new school will also take children of middle school age to ease the problem of numbers at Bishop Fitzgerald and St Anne's schools.
- 9.4 With further significant planned developments, school provision needs to be kept under review to ensure that future land requirements are safeguarded and protected from other development.

Health

- 9.5 There are two civilian hospitals in Gibraltar, St Bernard's and the King George V hospital, the latter being a hospital for the treatment of mental illness. In addition there is a Government Primary Health Care Centre situated at Casemates Square. There are also various private doctor and dentists surgeries, and other medical offices mainly concentrated in the town area.
- 9.6 St Bernard's Hospital has recently been relocated from its original site in the Upper Town to more spacious and recently refurbished premises at Europort.

9.7 The Government is currently reviewing options for the possible relocation of the psychiatric hospital.

Religious facilities

9.8 Gibraltar has a diversity of religions and this is reflected in the range of buildings of worship found throughout Gibraltar. During the 1990s a mosque was built at Europa Point and a Hindu temple in Engineer Lane. A further Mosque is temporarily located in the ex-Parish Hall at the southern end of the boulevard at Line Wall Road. The location of this building is such that it prevents the linking up of Wellington Front and the wider defensive walls. This matter is dealt with in more detail in the Old Town Plan.

Other community facilities

9.9 Future development and changes in the distribution of population means that all community facilities, ranging from social halls to day centres for senior citizens, needs to be monitored and kept under review to ensure that available resources are fully utilised. This will be the responsibility of the pertinent authorities.

POLICY S1 – SOCIAL AND COMMUNITY USES

THE LAND REQUIREMENTS FOR EDUCATIONAL, COMMUNITY AND RELIGIOUS FACILITIES SHALL BE KEPT UNDER REVIEW IN ORDER TO TAKE ACCOUNT OF CHANGES IN NUMBERS AND DISTRIBUTION OF THE POPULATION.

HM Prison

9.10 The existing prison is located within the grounds of the Tower of Homage, one of Gibraltar's most important historic buildings. As a result of the following factors the Government has taken the decision to relocate the prison:

- The site is of great historical value and the Government wishes to conserve the Tower and its environs and to maximise its tourist potential. More specific policies are set out in the Old Town Plan.
- The prison is located in the Upper Town that is densely populated and the prison use is not considered compatible with the residential use of the surrounding area.

9.11 A suitable site for the Prison was identified at Lathbury Barracks. Construction work on the new prison complex started in 2007 with completion in 2009.

Cemetery

9.12 The cemetery currently in use, is located immediately to the south of the runway and is segregated into areas serving the different religious sectors of the community. The MOD is to release an area of land adjacent to the existing cemetery that will allow for some

expansion (details are provided in Part II). In addition, a crematorium has been provided at Governor's Cottage Camp and it is expected that this new facility will help in reducing the demand for space at the cemetery during the period of this Plan.

- 9.13 The cemetery is an important site in terms of its ecology and contains a number of protected species. Any works in this area need to bear this in mind.

10 LEISURE AND RECREATION

Introduction

- 10.0 Leisure and recreation together with cultural activities are considered a vital part of modern life and the Development and Planning Commission recognises the benefits that such activities bring to the community. These include a healthier population, social benefits such as providing a sense of personal and community well-being and the benefits to the local economy through the hosting of recreational or cultural events that attract people from outside Gibraltar.
- 10.1 Activities may take the form of formal or informal activities. Formal activities such as organised sports are popular in Gibraltar and the provision of the necessary infrastructure to develop sporting activities is vital in enabling these sports to develop. Gibraltar sporting associations are increasingly participating in international events and their presence is beneficial to the promotion of Gibraltar in its widest sense. Informal recreation, such as walking, is a healthy pursuit and many residents take the opportunity of enjoying Gibraltar's Nature Reserve to follow this pursuit. The accommodation of such activities in the Nature Reserve is therefore important as is the provision of open areas and play areas generally where recreational activities can be carried out. Cultural activities are another form of recreation and Gibraltar has a wide and interesting mix of events throughout the year.
- 10.2 The demand for recreation and leisure facilities often translates into a demand for land and premises that, in Gibraltar where there is a limited area of land, can often be difficult to meet.
- 10.3 The planning approach to this issue needs to be clear and the following are the main elements:
- Make better use of existing facilities, including the joint use of facilities;
 - Secure leisure and recreation facilities within new housing developments;
 - Attract private investment into new leisure and recreational developments;
 - Protect existing leisure and recreational facilities.

Maximising existing facilities

- 10.4 In an area like Gibraltar where land is at a premium it is important to fully utilise existing facilities for the benefit of the community as a whole. In addition to publicly available facilities, e.g. Bayside Sports complex, other facilities exist within schools and clubs. The Government wishes to promote the co-ordinated use of such facilities and has established a statutory sports and leisure authority to secure this objective.

POLICY LR1 – MAXIMISATION OF FACILITIES

INCREASED PUBLIC ACCESS TO EXISTING RECREATIONAL FACILITIES SHALL BE MAXIMISED BY THE CO-ORDINATED USE OF FACILITIES THROUGH THE SPORTS AND LEISURE AUTHORITY.

New development - provision of facilities

- 10.5 It is often possible to secure the provision of additional leisure and recreational facilities as part of new development projects. Such provision, even if restricted to the residents, reduces pressure on public facilities. Developers should be encouraged to make appropriate provision within their proposed developments and this should be taken into account at an early stage in the design process so that such facilities become an integral part of the design of the development.
- 10.6 Furthermore, developers should be encouraged to give serious consideration to the possibility of sharing proposed recreational facilities with adjacent communities where the latter has no existing provision. Traditionally such an approach has not been adopted in Gibraltar, however, there are potential benefits of sharing such facilities, particularly in relation to the long-term maintenance costs as these can be shared across a larger number of residents.

POLICY LR2 – LEISURE AND RECREATIONAL FACILITIES IN NEW DEVELOPMENTS

PROPOSALS FOR SIGNIFICANT DEVELOPMENTS WILL BE EXPECTED TO INCORPORATE ADEQUATE LEISURE AND RECREATIONAL FACILITIES TO PROVIDE FOR THE NEEDS OF THE PROSPECTIVE RESIDENTS OF THE DEVELOPMENT.

ENCOURAGEMENT SHALL ALSO BE GIVEN TO THE SHARED USE OF PROPOSED RECREATIONAL FACILITIES WITH ADJACENT COMMUNITIES WHERE THE LATTER HAS NO EXISTING PROVISION.

Existing parks, playgrounds and informal open spaces

- 10.7 Existing public parks, playgrounds and informal open spaces are heavily used and as a result often suffer in their appearance and general condition. It is important to protect existing parks and open areas to ensure that they remain available for public use and to implement a programme of maintenance to ensure that they are kept in good condition for the benefit of the general public.

POLICY LR3 – PROTECTION OF PARKS, ETC.

EXISTING PARKS, PLAYGROUNDS AND INFORMAL OPEN SPACES WILL BE PROTECTED FROM DEVELOPMENT AND ENHANCEMENT OF THE FACILITIES SHALL BE KEPT UNDER REVIEW.

IN EXCEPTIONAL CASES, PROPOSALS INVOLVING THE LOSS OF PARKS, PLAYGROUNDS OR INFORMAL OPEN SPACES, MAY BE PERMITTED PROVIDED THAT THESE ARE RE-PROVIDED ELSEWHERE. THE RE-PROVISION MUST:

- A) BE FOR AN EQUIVALENT AREA OF LAND OR MORE;**

- B) BE READILY ACCESSIBLE TO THE PUBLIC; AND**
- C) INCLUDE THE PROVISION OF AN EQUIVALENT OR BETTER LEVEL OF FACILITIES, COMPARED TO THAT BEING LOST.**

Sporting facilities

10.8 The main concentration of public sporting facilities are situated at the Bayside Sports Complex where there is an extensive range of indoor and outdoor sports facilities.

Premises for sporting organisations

10.9 Historically, the Government has accommodated demand for premises from the various sporting organisations by allocating premises on an ad-hoc basis. This has led to a situation whereby sporting organisations have premises distributed all over Gibraltar, often not ideally located and often causing difficulties with the neighbouring area through, for example, causing parking problems during certain times or on certain days of the week. In addition, the premises often occupied by such organisations would be more suitable for alternative uses such as small-scale employment uses.

10.10 There is a need to assess the current situation and to establish whether it would be possible to provide some central facilities that could be used jointly by sporting organisations. If this is possible it would be beneficial to Government as it could free up premises that could then be used for income-generating activities, such as small-scale employment use for which there is a very high demand. In addition such an assessment should consider the social costs and benefits and sustainability issues in terms of accessibility by 'green' transport options.

POLICY LR4 – SPORTING ORGANISATIONS PREMISES

A REVIEW WILL BE UNDERTAKEN TO ASSESS THE EXISTING SITUATION AS REGARDS SPORTING ORGANISATIONS AND THE PREMISES OCCUPIED, WITH A VIEW TO PROVIDING CENTRALISED FACILITIES THAT COULD BE USED JOINTLY BY SPORTING ORGANISATIONS.

Youth Facilities

10.11 The youth service runs the following youth facilities:

- Montagu Youth Centre
- Dolphins Youth Club
- Laguna Youth Club
- Plater Youth Club

- 10.12 Additional youth facilities are provided by non-governmental organisations.
- 10.13 These facilities are invaluable in providing premises and activities to cater for the needs of the youth. However, with the changes in the distribution of the population in recent years and with potential further changes, it is important to ensure that such facilities are appropriately located and adequate to meet demand.

POLICY LR5 – YOUTH FACILITIES

THE PROVISION OF YOUTH FACILITIES SHALL BE MONITORED AND KEPT UNDER REVIEW TO ENSURE THAT DEMAND IS ADEQUATELY MET.

Informal recreation

- 10.14 In addition to informal open spaces the Alameda Gardens and the Nature Reserve provide the main opportunity for informal recreation. Specific policies for these areas are included in the policies for the respective zones in Part II of this Plan.

Beaches

- 10.15 The public beaches at Eastern beach, Catalan Bay, Sandy Bay, Western Beach, Camp Bay and Little Bay represent valuable areas for leisure and recreation that are used by both residents and visitors alike. There are Government proposals to extend the beaches at both Eastern Beach and, subject to consultation with residents, at Catalan Bay too. In this respect proposals have been formulated for the extension to these beaches to include long-term protection measures to ensure that the newly extended beaches are properly protected from the elements and thereby ensure their long-term survival.
- 10.16 Due consideration shall be given to the potential effect of the proposed beach nourishment plans on the marine environment, on current flows, sediment transport flows and on potential pollutants from the fill material.
- 10.17 To maximise the attractiveness of the newly extended beaches environmental improvement works are proposed for Eastern Beach whilst at Catalan Bay works have already been undertaken. In addition, the proposed mixed development at the Eastside reclamation will further contribute to the improvement of the area generally.
- 10.18 Development proposals that are considered to have an adverse impact on any of the beaches will not be permitted.

POLICY LR6 – PUBLIC BEACHES

THE ENHANCEMENT OF EXISTING, AND THE DEVELOPMENT OF NEW PUBLIC BEACHES WILL BE ENCOURAGED. PROPOSALS THAT WOULD ADVERSELY AFFECT PUBLIC BEACHES WILL NOT NORMALLY BE PERMITTED.

The Waterfront

- 10.19 Gibraltar is virtually surrounded by water yet historically public access has been limited, particularly on the west side in the harbour area, largely through MOD ownership of land. The situation has improved over recent years with public access being provided at Queensway Quay, Marina Bay/Ocean Village and the Harbour Views promenade.
- 10.20 The waterfront is an important recreational resource for both residents and visitors alike and can make an important contribution to the quality of life of residents and through the creation of an attractive environment assists in the promotion of Gibraltar as a tourist destination. An attractive and vibrant waterfront can also have important commercial value.
- 10.21 The overall policy objective is to maximise public access to the waterfront. Any development proposals on the waterfront will therefore be required to make adequate provision for unrestricted public access along the entire waterfront of the development site. It will be expected that such access comprises a promenade of substantial width, for use by pedestrians and where appropriate, cyclists. Public access must be available 24 hours a day and applicants should take account of this requirement from the outset of the development of their design concept. Wherever possible, waterfront promenades shall be required to link up with any existing (or proposed) adjacent promenades to form linear routes along the waterfront.

POLICY LR7 – WATERFRONT ACCESS

ALL NEW DEVELOPMENTS ON THE WATERFRONT WILL BE REQUIRED TO MAKE PROVISION FOR A PEDESTRIAN WATERFRONT PROMENADE. ANY SUCH PROMENADE MUST:

- A) BE FREELY AVAILABLE TO THE GENERAL PUBLIC AT ALL TIMES;***
- B) BE OF SUBSTANTIAL WIDTH;***
- C) IN APPROPRIATE CASES, MAKE ADEQUATE PROVISION FOR CYCLISTS;
AND***
- D) WHERE THERE IS AN EXISTING PROMENADE ON AN ADJACENT SITE,
OR WHERE ONE IS PROPOSED ON AN ADJACENT SITE, BE DESIGNED
SO AS TO LINK UP WITH THE ADJACENT (EXISTING OR PROPOSED)
PROMENADE.***

- 10.22 Whilst the above policy will address the provision of waterfront promenades within new schemes (new build or redevelopment), the issue of existing private developments on the waterfront with no public promenade needs to be addressed if the objective of a continuous waterfront promenade, particularly within the harbour area, is to be achieved.
- 10.23 The Development and Planning Commission will encourage all parties concerned to work towards providing waterfront promenades within these areas. It is recognised that this issue is problematical but a long-term vision is required and it is important that work on achieving this long-term goal starts now.

POLICY LR8 – EXISTING WATERFRONT SITES WITHOUT PUBLIC ACCESS

THE DEVELOPMENT AND PLANNING COMMISSION SHALL ENCOURAGE ALL PARTIES CONCERNED TO INVESTIGATE OPTIONS FOR THE PROVISION OF PUBLIC WATERFRONT PROMENADES ON SITES THAT ARE ALREADY DEVELOPED AND WHICH HAVE NO SUCH FACILITY. THE LONG-TERM OBJECTIVE IS TO PROVIDE A CONTINUOUS WATERFRONT PROMENADE, PARTICULARLY WITHIN THE HARBOUR AREA.

11 UTILITIES AND WASTE

Introduction

- 11.0 This section covers future development proposals by utility companies and Government, relating to water supply, sewerage and electricity. It also deals with the issue of waste management. The provision of utilities often requires land in terms of generation, storage and distribution of the product and thus can have a significant impact on the environment. The section also addresses telecommunications and the issue of renewable energy.
- 11.1 In Gibraltar the provision of utilities is carried out by a mix of private companies (albeit some partly Government owned), Government departments and Government agencies.
- 11.2 This section deals with specific requirements of the various utilities as appropriate and sets out planning policy in respect of these. However, on a general level, the provision of new infrastructure can have a detrimental impact on the environment. This impact is not limited to large-scale projects only but equally applies to small-scale projects. Much development carried out by the utilities does not require permission by virtue of the Town Planning Act. Nevertheless, it is appropriate to have a policy that aims to minimise the adverse effects on the environment, whether it be a new pumping station or a new meter boxes on the front of a protected building.

POLICY UW1 – NEW UTILITY SERVICES

IN CONSIDERING PROPOSALS FOR NEW UTILITY SERVICES, CAREFUL ATTENTION SHOULD BE GIVEN TO THEIR DESIGN AND LOCATION IN ORDER TO MINIMISE POSSIBLE ADVERSE EFFECTS ON THE ENVIRONMENT.

- 11.3 The Development and Planning Commission will encourage utility providers to give serious consideration to the siting of new utility services within the Rock wherever this is viable and appropriate. This option may be particularly relevant for new installations that may be unsightly or likely to cause disturbance.

Water supply

- 11.4 Gibraltar has a dual water supply system comprising potable water for human consumption and saltwater for sanitation, street flushing and fire fighting.
- 11.5 The water infrastructure, potable and salt water services including sewage pumping stations and mains, is managed by AquaGib on behalf of the Government. AquaGib is also responsible for ensuring developers adhere to the Public Health Act, Water Rules and best practice.
- 11.6 The payment for connection of any development into the water infrastructure is the developer's responsibility. Developers need to take into account, at an early stage, the potential impact on any existing infrastructure and the costs of the provision of water services to the development. In certain cases these costs may be significant.

Potable water

- 11.7 The collection of rainwater on the water catchments situated on the sandy slopes on the east side of the Rock for potable water was a feature of Gibraltar's water supply until the early 1990s. These catchments collected rainwater and channelled this into underground tanks where it was treated before entering the distribution network. This water was augmented by supplies from shallow wells located along the British Lines. Potable water is distributed throughout Gibraltar via a network of 80km of pipes.
- 11.8 From the late 1960s seawater desalination has provided the bulk of potable water supplies. There has been a move from thermal distillation to the more efficient reverse osmosis process of desalination so that currently virtually all of Gibraltar's potable water requirements are produced by this means. This follows the recent introduction of two new 1200m³/day plant that supplement the two 1000m³/day units installed in 2001 in the ex-MOD Laundry tunnels at Governor's Cottage Camp. The existing desalination plant at the North Mole site are nearing the end of their design life and will be de-commissioned when they become surplus to requirement.
- 11.9 The MOD has its own separate desalination plant that supplies all MOD properties.
- 11.10 Section 3 of the Plan emphasised the strategic importance of maintaining at least two saltwater intakes for desalination purposes that are remotely located from each other. Although, the current proposal involves locating all reverse osmosis units in a single location with a single source, this is an interim measure and the strategic case for separate water intakes remains. The possible production of potable water as a by-product of the energy from waste facility and from electrical generation are being considered and if feasible would effectively result in the creation of a separate saltwater intake for desalination purposes. However, since the location of these facilities are likely to be in the Governor's Cottage Camp /Lathbury Barracks area any new saltwater intake will not be that distant from the existing Little Bay intake.
- 11.11 If the option of producing potable water as a by-product of the energy from waste facility or from electrical generation is found not to be feasible then an alternative site will be required for a desalination plant. Section 11 of Part II of the Plan provides further details on the safeguarding of a potential site on reclaimed land off North Mole Road.
- 11.12 As referred above, some limited water extraction takes place from shallow wells at British Lines. The source of this water is an aquifer that lies at a depth of about 2 to 3m below ground level. The aquifer lies below the entire airport and extends into Spain to the North. The aquifer is one of two groundwater bodies, the Northern Groundwater Body (Isthmus Sands – Upper Aquifer) and the Southern Groundwater Body Aquifer (Aquifer in bedrock), defined under the Public Health (Water Framework) Rules 2004. The Northern water body has been identified as a Protected Area for drinking water, a consideration when assessing development proposals that may have an impact on this groundwater body.

Sea water

- 11.13 The saltwater system consists of raw seawater being pumped from two stations located at North Mole and Gun Wharf to various service reservoirs located around Gibraltar. The water is then fed by gravity through the distribution network comprising some 80 km of mains.

Water consumption

11.14 Over the last two decades water consumption has gradually increased. Clearly the greater the water requirements the greater the energy required to produce it, normally through the use of electrical power and fuel oil. The reduction of energy consumption and therefore the conservation of the earth's natural resources must be an objective for all Governments. With this in mind encouragement shall be given to the consideration of measures to reduce water supply in proposed development schemes including refurbishment works and building conversions. Such measures may include, but not be limited to, the collection and use of rainwater and re-use of potable water. These measures may be particularly useful in reducing water demand for irrigation purposes

POLICY UW2 – WATER CONSERVATION

DEVELOPMENT PROPOSALS WILL BE ENCOURAGED TO GIVE CONSIDERATION TO WATER CONSERVATION AND MANAGEMENT, FOR EXAMPLE THROUGH RAINWATER COLLECTION AND POTABLE WATER RE-USE TO REDUCE THE DEMAND FOR WATER.

Foul and surface water

11.15 Gibraltar's foul sewerage system dates back to the late 1800s with the main trunk sewer having been constructed in 1896. Much of the system works by gravity although a pumping system is required to pump sewage into the main trunk sewer, particularly from areas on the Northern and Eastern sides, and the reclaimed areas. The Government is currently undertaking a study of the sewerage system to evaluate its condition and capacity. The system discharges into the sea at the southern end of the Rock.

11.16 The Government is investing in a new Waste Water Treatment Works that shall treat Gibraltar's wastewater before discharging into the sea. This facility shall ensure that Gibraltar complies with its EU obligations in particular in relation to the Urban Wastewater Treatment Directive. A site has been allocated for this purpose and further details are provided in Part II of the Plan.

11.17 The surface water network is combined with the foul sewerage system in some areas, mainly in the Old Town. Where surface water is piped separately it is discharged at various points along the coastline or into Port waters.

Electrical generation

11.18 Gibraltar's electricity is provided by the Waterport power station supplemented by the privately operated OESCO station at the Europa Business Centre, whilst a separate power station currently located at the Naval Base, supplies electricity to the MOD.

11.19 All three existing power stations are being considered for decommissioning due to a combination of their age and condition and the environmental concerns arising from the operation of old generating sets in close proximity to populated areas. In addition, these

stations are nearing their maximum capacity and with additional development that is expected, generating capacity will need to be increased. There is some limited scope to expand the existing stations at their present sites, however, the extra capacity that could be accommodated would be limited. In addition, the location of the existing stations in close proximity to existing and proposed residential areas is not ideal and, taken together with the limited area of land available for expansion on the current sites, has led the Government to consider the feasibility of providing a new and enlarged generating station in a more appropriate location elsewhere thereby replacing all three existing stations. The Government has identified a preferred site at Lathbury Barracks and more details are provided in the relevant section of Part II of the Plan.

Telecommunications

11.20 Gibraltar's limited geographical area means that the demand for telecommunication plant to meet local requirements is fairly restricted. From time to time however, there may be a requirement to replace existing or introduce new equipment. Telecommunication equipment, particularly masts, can have a significant impact on the environment. Whilst recognising the locational requirements for such equipment care must be taken to ensure that the visual impact is minimised. The location of such equipment on buildings will normally be the preferred option subject to other policies of this Plan, and serious consideration should be given to the sharing of existing masts wherever this is possible.

POLICY UW3 – TELECOMMUNICATION DEVELOPMENT

PERMISSION FOR TELECOMMUNICATION DEVELOPMENT WILL ONLY BE PERMITTED WHERE:

- A) ITS SITING AND DESIGN WILL NOT DETRACT FROM THE CHARACTER OR AMENITY OF THE AREA;***
- B) DOCUMENTARY EVIDENCE OF ALTERNATIVE SITES CONSIDERED FOR THE SITING OF THE EQUIPMENT AND FOUND TO BE UNFEASIBLE IS SUBMITTED; AND***
- C) THERE IS NO UNACCEPTABLE IMPACT ON RESIDENTIAL AMENITY.***

Renewable energy

11.21 Renewable energy covers those sources of energy, other than fossil fuel or nuclear fuel, which are continuously and sustainably available in our environment. There are various international agreements that aim to reduce energy consumption and promote renewable energy.

11.22 Within Gibraltar the potential for renewable energy generation exists particularly through wind, wave, tidal and solar power. Large-scale proposals, by their very nature, could potentially have a significant impact on the environment particularly as Gibraltar is such a small area. When considering proposals for renewable energy schemes a balance has to be struck between the impact of the proposal and its wider environmental benefits.

POLICY UW4 – RENEWABLE ENERGY SCHEMES

PROPOSALS FOR RENEWABLE ENERGY SCHEMES WILL NORMALLY BE PERMITTED PROVIDED THAT THEY:

- A) WILL NOT HAVE AN UNACCEPTABLE VISUAL IMPACT;**
- B) WILL NOT HAVE AN UNACCEPTABLE IMPACT ON THE CHARACTER OF ANY STATUTORILY DESIGNATED AREA, OR OTHER AREA OF NATURE OR HERITAGE INTEREST; AND**
- C) WILL NOT HAVE AN UNACCEPTABLE IMPACT ON NEIGHBOURING USES OR THE SURROUNDING ENVIRONMENT BY REASON OF NOISE, ODOUR, POLLUTION OR VISUAL INTRUSION.**

Waste

11.23 Waste generation represents mis-management of natural resources. In order to contribute towards sustainability objectives there is a need to reduce waste production through the use of longer lasting and recyclable products, by reusable products, by finding beneficial use for waste e.g. recycling of glass, energy recovery.

11.24 The amount of municipal waste collected has been on the increase and between 1993 and 2002 there was a 38% increase. In 2002 Gibraltar produced 22,700 tonnes of municipal waste¹.

11.25 Traditionally Gibraltar has incinerated its municipal waste and construction waste has been deposited in reclamation sites.

11.26 The existing energy from waste facility has been out of operation since 2000 following a major plant failure and municipal waste is currently transported to landfill sites in Spain. The existing energy from waste facility was designed with heat recovery to generate electricity and potable water from a thermal desalination process.

11.27 The disposal of municipal waste to Spain is a temporary measure and the Government requires that Gibraltar must be self sufficient in terms of municipal waste disposal. The Government has therefore decided to refurbish the existing energy from waste facility to enable the thermal destruction of municipal solid waste and sewage sludge on the existing site. The source of the sewage sludge will be the proposed Waste Water Treatment Plant referred to earlier in this chapter. A site for this purpose has been allocated at Europa, namely the Brewery Crusher site and further details are provided in Part II of the Plan.

11.28 Since 1988 construction waste has been deposited on the eastside reclamation site situated between Catalan Bay and Eastern Beach. The site is to be developed and there is therefore a need to identify an alternative site that can be used for the deposit of construction waste. Notwithstanding this, there are currently proposals to introduce rock-crushing facilities into Gibraltar that would be able to handle the majority of construction rubble and recycle this

¹ Gibraltar Waste Management Plan, 2004

for use in future construction projects. It may well be the case therefore, that there will be a reduction in the volume of construction waste that needs to be deposited, and this will be an important consideration in identifying any future site.

11.29 In order to avoid future issues of land contamination and to prevent contamination of surrounding areas, particularly the marine environment, it will be important to ensure that the proposed waste site is effectively managed to ensure that only 'clean' waste is deposited.

11.30 The use of land as a construction waste site has the potential to result in significant effects on the environment that would need to be assessed. It is therefore likely that the proposed construction waste site would need to be subject to an EIA.

POLICY UW5 – CONSTRUCTION WASTE

A SUITABLE SITE FOR THE DISPOSAL OF CONSTRUCTION WASTE SHALL BE IDENTIFIED.

11.31 Clinical waste is generated from sources such as medical, nursing, dental and veterinary practices with the main sources being St Bernard's Hospital and the Royal Naval Hospital. Clinical waste is defined as hazardous and is subject to specific disposal requirements. The Government has recently provide a local disposal facility and details are provided within the relevant chapter in Part II of this Plan.

Recycling

11.32 Currently there are no recycling facilities available in Gibraltar. Gibraltar's small size makes it difficult for such an operation to be viable. Nevertheless, the principle of recycling is to be encouraged and proposals for such a facility will be considered favourably subject to there being no adverse effects on the environment.

POLICY UW6 – RECYCLING FACILITIES

PROPOSALS TO DEVELOP RECYCLING FACILITIES SHALL BE FAVOURABLY CONSIDERED PROVIDED:

- A) THERE IS NO UNACCEPTABLE VISUAL IMPACT; AND***
- B) THERE IS NO UNACCEPTABLE IMPACT ON THE CHARACTER OF THE AREA, NOR ON THE AMENITIES OF THE AREA BY VIRTUE OF NOISE, DISTURBANCE, ODOUR, AND TRAFFIC MOVEMENTS.***

11.33 In order to encourage domestic recycling it is considered that a public central collection facility would be extremely beneficial. Such a facility would allow the organised collection of separated recycled waste that would subsequently be forwarded to an appropriate recycling facility, most likely in neighbouring Spain. A suitable site will need to be identified for this purpose.

POLICY UW7 – WASTE RECYCLING COLLECTION FACILITY***A SUITABLE SITE FOR USE AS A PUBLIC CENTRAL COLLECTION FACILITY FOR RECYCLED WASTE SHALL BE IDENTIFIED.*****Public Bin Stores**

- 11.34 Throughout Gibraltar bin stores or compounds have been provided to accommodate large refuse bins where residential and commercial refuse is deposited on a daily basis. This refuse is collected daily by the Government refuse service.
- 11.35 Such stores or compounds can be unsightly and often cause an odour nuisance. They also attract animals that forage in the waste frequently scattering waste that has not been securely contained. This exacerbates the unsightly appearance of such areas, results in littering of the area and can result in staining of the surrounding floor surfaces.
- 11.36 One solution to these problems would be the creation of underground refuse storage areas. These involve the creation of a void in which the large refuse containers are placed, and which can be accessed by means of a hydraulically operated platform. The only structure visible at ground level is the bin through which the refuse is deposited and as a result the street environment is greatly enhanced. In addition, the refuse is inaccessible to scavenging animals and since the whole structure can be sealed it virtually eliminates odour nuisance.
- 11.37 The technology for such facilities exists and is widely used elsewhere in Europe, and the Development and Planning Commission is keen to investigate the feasibility of introducing the concept to Gibraltar. In assessing the feasibility it will give particular attention to those areas where existing compounds have greatest negative visual impact, particularly in parts of the Old Town.
- 11.38 The Development and Planning Commission will encourage new development projects to consider the inclusion of such refuse facilities within their developments.

POLICY UW8 – REFUSE STORAGE***THE FEASIBILITY OF REPLACING EXISTING PUBLIC REFUSE STORES/ COMPOUNDS WITH UNDERGROUND STORAGE AREAS WILL BE INVESTIGATED.******NEW DEVELOPMENT PROPOSALS WILL BE ENCOURAGED TO GIVE SERIOUS CONSIDERATION TO THE INCLUSION OF SUCH REFUSE FACILITIES.***

PART II

12 ZONE 1 – THE OLD TOWN

General

- 12.0 The zone of the Old Town lies within the City Walls and includes the Northern Defences. It is a densely built up area with a population of some 6400 at the time of the 2001 census. The population of the Old Town has in fact been reducing in the recent past, mainly as a result of the movement of people out to the new residential areas constructed on the reclamation sites.
- 12.1 The Old Town contains Gibraltar's principal shopping area centred on Main Street together with ancillary uses such as hotels, restaurants and bars. It also contains many small office premises usually within the shopping area on upper floors. Outside the shopping area the zone is almost exclusively residential in nature, providing a variety of accommodation from large ex-colonial houses to small bed-sits.

The Old Town – built environment

- 12.2 The Old Town has developed over hundreds of years and this development is reflected in its layout, street pattern, the architecture of its buildings and its open spaces. These elements when taken together give the Old Town its unique character and are one of the major attractions of Gibraltar.
- 12.3 The 1991 Development Plan policy objective was to conserve the character of the zone and improve its environment and facilities. This, in the main, has been successful and the policy will be carried forward and developed further in this Plan.
- 12.4 The development of this policy approach is set out in detail in:
- The Old Town Plan; and
 - The Old Town Design Guide
- 12.5 All development proposals within the zone will be required to comply with these.

POLICY Z1.1 – THE OLD TOWN

THE PRIMARY OBJECTIVE WITHIN THE OLD TOWN WILL BE TO RETAIN AND ENHANCE THE EXISTING CHARACTER AND LAND USE PATTERN THROUGH AN OLD TOWN PLAN AND DESIGN GUIDE. PLANNING PERMISSION WILL NORMALLY ONLY BE GRANTED FOR DEVELOPMENT PROPOSALS THAT ACCORD WITH THESE DOCUMENTS.

13 ZONE 2 — BAYSIDE/WESTSIDE

General

13.0 The zone extends from Marina Bay in the north to Gun Wharf in the south. It includes Gibraltar's existing marinas, significant residential areas, an extensive waterfront and commercial development.

Bayside

13.1 In the north of the zone is the Bayside Sports Complex that provides modern playing facilities for a wide range of sporting activities.

13.2 It is intended that the car parking requirements for the Sports Complex would be met by the development of a multi storey car park to be developed on land to the west of the Tercentenary Sports Hall. This facility is also intended to serve car parking needs for Marina Bay and for the area generally. A development proposal for this site involving a mixed multi-storey car park with limited commercial development has received approval. However, it is prudent for the Plan to make a specific allocation for this site to ensure that there is no doubt as to the future use of this site.

POLICY Z2.1 – CAR PARK, BAYSIDE SPORTS COMPLEX

LAND IS ALLOCATED ADJACENT TO BAYSIDE SPORTS COMPLEX, AS SHOWN ON THE PROPOSALS MAP, FOR USE AS CAR PARKING TOGETHER WITH LIMITED COMMERCIAL USE.

13.3 Marina Bay is an important recreational/tourist/commercial and residential development. Significant redevelopment of the area is underway and once complete should result in an attractive and vibrant development on the waterfront.

13.4 The policy objective for the area is to ensure the continued use of the area for recreational/tourist/commercial and residential use.

POLICY Z2.2 – MARINA BAY

THE RECREATIONAL/TOURIST/COMMERCIAL AND RESIDENTIAL USE OF MARINA BAY SHALL CONTINUE. PERMISSION FOR NEW DEVELOPMENT THAT IS COMPATIBLE WITH SUCH USE WILL NORMALLY BE GRANTED SUBJECT TO COMPLIANCE WITH OTHER POLICIES OF THE PLAN.

13.5 An area of land to the south of St Anne's School has outline permission for residential development with some limited commercial use at ground floor and is accordingly allocated in the Plan.

POLICY Z2.3 - SOUTH OF ST ANNE'S

A SITE OF APPROXIMATELY 0.24HA, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR RESIDENTIAL USE OR A MIXED RESIDENTIAL/COMMERCIAL USE.

Waterport Terraces

13.6 A major Government housing project known as Waterport Terraces, has been developed off North Mole Road. The project involves the provision of affordable housing and specialised accommodation for the elderly. In total some 400 affordable residential units are being provided, together with 140 units for the elderly in a sheltered environment.

North Mole Industrial area

13.7 To the North of North Mole Road is an area of land currently in industrial use. It comprises various storage sheds, the former components factory site and recently constructed Industrial Estate.

13.8 The former components factory site comprises a large building with open storage areas. It is intended to use the site to accommodate some of the existing industrial uses that currently occupy part of the site on the eastside that is allocated for development. However, since the site fronts the main access road to the Cruise Liner Terminal it is important that any development on the site takes into account the need to provide an attractive frontage to the road.

13.9 The Industrial Estate, developed by the Government, was designed to allow for a maximum of two additional floors in the future. It is therefore proposed to keep under the review the viability of adding further floors to provide additional car parking and/or units suitable for light industrial or storage use.

POLICY Z2.4 – NORTH MOLE INDUSTRIAL AREA

FAVOURABLE CONSIDERATION WILL BE GIVEN TO DEVELOPMENT PROPOSALS FOR:

- A) THE CONVERSION AND EXTENSION OF THE EXISTING BUILDING ON THE FORMER COMPONENTS FACTORY SITE FOR INDUSTRIAL USE;**
- B) THE PROVISION OF A MAXIMUM OF TWO ADDITIONAL FLOORS TO THE EXISTING INDUSTRIAL ESTATE.**

PROVIDED THAT THE DESIGN IS SYMPATHETIC TO THE SETTING AND IN PARTICULAR PROVIDES AN ATTRACTIVE FRONTAGE TO NORTH MOLE ROAD.

Waterport Power Station

- 13.10 In Part I of the Plan the need for increased electrical generation capacity had been identified and the Government is therefore proposing that a new electrical generation station be provided on an alternative site.
- 13.11 On the assumption that the existing generating station is relocated elsewhere, consideration will need to be given to the re-use of this site. The development of the site to the north for residential development, known as 'Waterport Terraces' and to the east on the ex-MOT site, for office development, are both important considerations in planning the future use of the site. The proximity of the site to The Port will be particularly attractive to Port-related businesses although a general industrial use for the site is not considered compatible with the adjacent uses referred to above. The use of the site for commercial purposes is considered to be a more compatible land use and will still be attractive to Port businesses as well as other commercial businesses. However, the possible relocation of the existing desalination plant immediately to the west of the generating station site opens up a unique opportunity to create a comprehensive development covering both sites.

Waterport desalination plants

- 13.12 The Waterport desalination plants are reaching the end of their design life. AquaGib identified a site on reclaimed land off North Mole Road as a suitable alternative site with access to bay water as opposed to harbour water. Outline planning permission was granted for a new desalination plant on this site however, due to the need for coastal protection works to adequately protect the site AquaGib has decided to increase capacity at its existing site at the ex-MOD Laundry Tunnels at Governor's Cottage Camp. This option was selected as it was immediately available. If a second desalination plant is required the reclaimed site off North Mole Road may still be an option provided the necessary coastal protection works are undertaken.
- 13.13 It is therefore appropriate to safeguard the site from other development until a final decision is taken on whether it is required for a second desalination plant. The site is located within Zone 3 and a specific policy is included in that section of the Plan.
- 13.14 Should the site not be necessary for desalination purposes, its location within the Port and ease of accessibility remote from sensitive uses means that it would be well suited to Port/light industrial/warehousing uses.
- 13.15 Once the existing North Mole plant has been relocated the existing site would become available for redevelopment. An assessment would need to be undertaken to verify whether the site is contaminated and if so what remediation works would be required to enable its redevelopment.
- 13.16 This site, when taken together with that of the electricity generating station immediately to the west, represents an opportunity to undertake a comprehensive development covering both sites. It is therefore proposed that both sites be developed as a mixed use development comprising primarily office and storage/distribution uses although some

residential development may be permitted at the eastern end of the site. Conceptually, any residential element should be “buffered” from the storage/distribution element by office use. Additionally, the storage/distribution uses should be set back within the site with the other uses (office and residential) developed along the site frontage. In this way the more “industrial nature” of the storage/distribution use will be visually screened from the road and some distance from nearby residential developments thereby minimising any likely disturbance to residents. This approach would comply with the policy objective of seeking to achieve attractive frontage development to North Mole Road.

POLICY Z2.5 – EXISTING SITES OF DESALINATION PLANT/ GENERATING STATION

THE SITES OF THE EXISTING DESALINATION PLANT AND ELECTRICITY GENERATING STATION, AS SHOWN ON THE PROPOSALS MAP, ARE ALLOCATED FOR MIXED RESIDENTIAL, OFFICE AND STORAGE /DISTRIBUTION USE. THE FRONTAGE OF THE SITE WOULD BE RESTRICTED TO RESIDENTIAL AND/ OR OFFICE USE ONLY WHILST STORAGE/DISTRIBUTION USE WOULD BE CONCENTRATED TO THE REAR.

Reclaimed area

13.17 The 1991 Plan made provision for a major reclamation scheme comprising a mix of residential, commercial and office development. This development area has now been largely completed.

13.18 Additional land reclamation is being undertaken to the south of Europort, known as the ‘Mid Harbour’ project. This reclamation serves two purposes:

- i) to provide land for development purposes, and
- ii) to enable a new road to be constructed from Europort Avenue to Coaling Island to relieve traffic congestion at the junction between Europort Avenue and Queensway.

13.19 The reclamation scheme will provide some 3.45ha of land. In addition, existing uses on the Northern side of Coaling Island will be relocated, thereby releasing a further 0.95ha of land to enable a comprehensive development to take place.

13.20 The Government has identified the need to provide land for a significant amount of Government-rented accommodation and having identified the Mid Harbour area as an appropriate location for such development commenced construction in 2008. With careful layout and design, including open space and the provision of a public waterfront promenade to link up with existing and proposed promenades to the north and south of the site, a new and attractive waterside environment will be created that is easily accessible and within easy walking distance of the town centre with its many services and facilities.

13.21 On completion, the Mid-Harbour project will eventually provide for some 500 Government rented apartments, a new school, a new link road and appropriate open space including a waterfront promenade.

POLICY Z2.6 – MID-HARBOUR RECLAMATION

AN AREA OF APPROXIMATELY 4HA IS ALLOCATED FOR DEVELOPMENT BETWEEN EUROPORT AND COALING ISLAND, AS SHOWN ON THE PROPOSALS MAP, AND SHALL MAKE PROVISION FOR:

- A) A NEW LINK ROAD FROM EUROPORT ROAD TO COALING ISLAND;*
- B) THE RE-PROVISIONING OF EXISTING USES AFFECTED BY THE RECLAMATION;*
- C) A TOTAL OF SOME 500 GOVERNMENT RENTED RESIDENTIAL UNITS;*
- D) A NEW SCHOOL;*
- E) APPROPRIATELY DESIGNED AND LANDSCAPED OPEN SPACES, AND*
- F) A WATERFRONT PROMENADE.*

Naval grounds No. 1 and 2

13.22 These two ex-sports pitches together with the land in-between them, represent a significant development opportunity in close proximity to the city centre.

13.23 The MOD is due to transfer the Naval Ground No 1 to the Government in the near future.

13.24 The open nature of this site introduces an important open area into the otherwise built up area of the Old Town to the east and residential areas to the west. This open character further allows for views of an important section of the City Walls and from which there is direct access to the centre of the Town. This is also an important dropping off point for buses on the frontier-city centre bus route, and as such is a well-used entry point to the town for many visitors to Gibraltar.

13.25 Naval Ground No 2 currently contains an unsightly multi-storey car park that was initially constructed as a temporary measure to meet the demand for additional car parking outside the City Walls. This structure has a significant visual detrimental effect on the setting of the historic city walls immediately to the east.

13.26 In-between the two grounds are a number of buildings that are currently vacant or occupied by temporary uses.

13.27 The proposal is to undertake a comprehensive redevelopment of the entire site. In doing so the following factors need to be taken into account:

- the setting of the City walls;
- recognition that the area is an important 'gateway' into the City;
- the Government's desire to create a significant public open space; the need to provide significant areas of public car parking in addition to any parking requirements arising directly from any new uses on the site;
- the need for a sensitive landscaping scheme.

13.28 It is therefore proposed that the following uses shall be incorporated into any redevelopment scheme for this site:

- Provision of underground car parking – this would assist in alleviating the current car parking shortage for residents of the town area whilst also providing visitor parking for tourists in a location that would be easily accessible and would avoid the need for tourist traffic to enter the town area;
- A public park, suitably landscaped shall be provided on the site of the existing Naval Ground No 1 – this would create an important open area within the centre of the built up area for the benefit of the general public, retain the views and appreciation of the City Walls and provide an attractive entry point to the centre of the town.
- A mix of residential and office use shall be provided on the site of the Naval Ground No 2. Such a use is considered appropriate for the site and would benefit from the locational advantages of the site, being well located in terms of public transport and private transport, close to both the Finance Centre at Europort and the Town Centre.

POLICY Z2.7 – NAVAL GROUNDS NO 1 AND 2 – REDEVELOPMENT

THE SITE OF NAVAL GROUNDS NO.1, AND 2, AS SHOWN ON THE PROPOSALS MAP, SHALL BE REDEVELOPED AS FOLLOWS:

- A) A PUBLIC LANDSCAPED PARK SHALL BE CREATED ON THE SITE OF NAVAL GROUND NO 1;***
- B) UNDERGROUND PUBLIC CAR PARKING SHALL BE PROVIDED;***
- C) THE EXISTING MULTI-STOREY CAR PARK SHALL BE REMOVED AND THE NAVAL GROUND NO 2 SHALL BE REDEVELOPED AS A MIXED USE SCHEME COMPRISING RESIDENTIAL AND OFFICE WITH ASSOCIATED UNDERGROUND CAR PARKING;***

ANY SCHEME FOR THE MIXED USE DEVELOPMENT SHALL BE DESIGNED SO AS TO BE SYMPATHETIC TO THE SETTING OF THE CITY WALLS AND SHALL INCORPORATE A SUITABLE LANDSCAPING SCHEME.

Queensway Quay/Gun Wharf

13.29 Queensway Quay was developed during the 1990s and comprises apartments, commercial units and a marina. Additional apartments were constructed along Gun Wharf at the southern end of the quay as part of a later phase. The development of the Queensway Quay area envisaged a mix of uses comprising residential, leisure, tourist and commercial, and this policy will continue. The development of Queensway Quay has opened up part of the waterfront to the general public and provides an attractive recreational amenity. The existing waterfront promenade extends from the western end of Gun Wharf along Queensway Quay itself and to the southern boundary of Cormorant Wharf, thus providing the potential to continue the promenade to the North when the opportunity arises.

- 13.30 More recently, an 'island' has been constructed across part of the marina and a total of nineteen houses have been constructed. In addition to providing a site for development, the 'island' has improved the marina facility by creating a breakwater that protects the marina from the swell that previously affected it. In accordance with the objective of providing public access to the waterfront this development is required to accommodate public pedestrian access along the length of its eastern waterfront.
- 13.31 Planning permission has been granted for a residential development on the site of the northern camber of the marina and construction is underway.

POLICY Z2.8- QUEENSWAY QUAY

THE AREA OF QUEENSWAY QUAY COMPRISES A MIX OF RESIDENTIAL, LEISURE, TOURIST AND COMMERCIAL USE. THIS MIXED USE SHALL CONTINUE AND ANY DEVELOPMENT PROPOSALS FOR THIS AREA SHALL NEED TO BE COMPATIBLE WITH SUCH MIXED USE.

- 13.32 Sitting in-between Queensway Quay and the Naval Base to the south is Gun Wharf. Part of this site has been developed for residential purposes (on the northern side), however, the remainder of the site has remained vacant for a number of years, including the existing stone buildings and boat shed that are of historical significance. Although outline planning permission was previously granted for a residential scheme on this site, the site is now to be transferred to the MOD to accommodate the MOD's Gibraltar Squadron and Joint Physical Development Unit (which will need to be relocated from No 4 dock and Coaling Island to allow the Mid-Harbour reclamation to be fully implemented). The Development and Planning Commission will encourage the MOD to ensure that any development proposals on this site are sympathetic to the character and appearance of the existing buildings and that no activities are carried out that would have a detrimental effect on the residential amenities of the residents in the vicinity.

POLICY Z2.9 – GUN WHARF

THE DEVELOPMENT AND PLANNING COMMISSION WILL ENCOURAGE THE MOD TO ENSURE THAT ANY PROPOSED DEVELOPMENT ON THE SITE OF GUN WHARF ASSOCIATED WITH ITS MARINE USE, IS SYMPATHETIC TO THE CHARACTER AND APPEARANCE OF THE EXISTING STONE BUILDINGS AND THAT NO ACTIVITIES ARE UNDERTAKEN ON THE SITE THAT WOULD HAVE A SIGNIFICANT DETRIMENTAL EFFECT ON THE AMENITIES OF RESIDENTS IN THE VICINITY.

Coaling Island

- 13.33 Coaling Island currently accommodates a mix of uses. Its western arm contains the ex-ambulance station, a small social club and an ex-MOD cold store, whilst on the eastern side is a site previously accommodating temporary MOD residential properties (referred to as

The Cormorant). Further to the south of this site is the MOD dental and health centre that adjoins Cormorant Wharf on its South side.

- 13.34 The area provides an opportunity for a redevelopment scheme that is situated on the waterfront, that is in close proximity to the town centre, and which could link up with the existing waterside development at Queensway Quay and the future proposed development to the North of Coaling Island, known as 'Mid-Harbour' When all these disparate developments are linked up in this way an attractive, accessible and vibrant waterfront can be created that will benefit Gibraltar as a whole.
- 13.35 Planning permission has been granted for a phased residential development on this site, to be known as 'King's Wharf', which incorporates the desired waterfront promenade along the eastern edge of the basin. The first phase of this development is under construction.
- 13.36 It is intended that the western arm of the basin should be redeveloped for residential purposes. There may also be scope for the inclusion of a commercial element within the development, particularly for example, in the form of cafés and restaurants. It is important that any such development incorporates an appropriate waterfront promenade that can link in to that to be provided at King's Wharf, and furthermore, will need to link in with the proposed waterfront promenade to be provided within the Mid Harbour proposals.
- 13.37 The demand for additional land during the Plan period may require an assessment of potential areas suitable for reclamation to be undertaken some time during the life of the Plan. The area around Coaling Island is likely to be included in any such assessment.
- 13.38 The Government has recently completed a small boats mooring facility within the Coaling Island basin, allowing the re-location of the vast majority of vessels that were previously moored at Western Beach.

POLICY Z2.10 – COALING ISLAND

THE WESTERN ARM OF COALING ISLAND COMPRISING AN AREA OF SOME 1.2HA IS ALLOCATED FOR RESIDENTIAL USE ALTHOUGH DEVELOPMENT PROPOSALS THAT INCORPORATE SOME LIMITED COMMERCIAL USE WILL BE ENCOURAGED. ANY PROPOSAL MUST MAKE PROVISION FOR:

- A) A WATERFRONT PROMENADE AROUND THE ENTIRE LENGTH OF THE WATERFRONT, CONNECTING TO EXISTING AND PROPOSED PROMENADES TO THE SOUTH AND NORTH RESPECTIVELY;***
- B) THE PROMENADE IS TO INCORPORATE A CYCLE ROUTE.***

14 ZONE 3 — PORT AND HARBOUR

General

14.0 This zone covers the historical naval dockyards with many examples of fine 19th century buildings and structures. With the MOD cut backs of the 1980s and 1990s areas of the dockyards became surplus to MOD requirements and were handed over to the Government. The zone now includes the Naval Base including its wharfage, the ship repair yard and the New Harbours Industrial park. It is very much a working environment and this is expected to continue during the life of this Plan.

The Port

14.1 In accordance with International Ship and Port Security Code (ISPS) adopted by the Diplomatic Conference of the IMO in December 2002, since July 2004 the Port area has been more clearly defined through the introduction of 'Controlled' and 'restricted' areas. The total area covered by these designations is shown on the Proposals Map and within this area port related uses are expected to continue.

POLICY Z3.1 – PORT USES

WITHIN THE PORT AREA, AS DEFINED ON THE PROPOSALS MAP, FAVOURABLE CONSIDERATION WILL BE GIVEN TO DEVELOPMENT PROPOSALS FOR PORT-RELATED USES.

14.2 In considering proposals for development within the Port particular attention shall be given to the design of buildings that front onto North Mole Road, or are visually prominent from this route. North Mole Road is the only route for tourists disembarking from cruise liners to access the rest of Gibraltar. It is therefore important that these visitors are not confronted with an industrial and unattractive landscape. Significant investment has been made in the environmental improvement of this important access route from the Western Arm to Casemates and the Development and Planning Commission does not wish to see this investment eroded by the construction of unsightly buildings.

POLICY Z3.2 – POTENTIAL IMPACT ON NORTH MOLE ROAD

IN CONSIDERING PROPOSALS FOR NEW DEVELOPMENT THAT FRONT ONTO, OR ARE VISUALLY PROMINENT FROM, NORTH MOLE ROAD, PARTICULAR ATTENTION SHALL BE PAID TO:

- A) THE ARCHITECTURAL CHARACTER AND APPEARANCE OF THE BUILDING;
AND***
- B) THE VISUAL IMPACT OF THE PROPOSAL ON NORTH MOLE ROAD.***

- 14.3 As discussed in the preceding chapter that deals with Zone 2, land at the Western end of North Mole Road is to be safeguarded for possible future use as a desalination plant.

POLICY Z3.3 - DESALINATION PLANT – SAFEGUARDING

A RECLAIMED SITE TO THE NORTH-WEST OF NORTH MOLE ROAD SHALL BE SAFEGUARDED FOR USE AS A DESALINATION PLANT. SHOULD IT BE DECIDED THAT THE SITE IS NOT REQUIRED FOR THIS PURPOSE ALTERNATIVE USES FOR PORT-RELATED ACTIVITIES, LIGHT INDUSTRIAL OR WAREHOUSING WILL BE FAVOURABLY CONSIDERED. ANY PROPOSAL SHALL PAY DUE REGARD, IN THE LAYOUT AND DESIGN OF BUILDINGS, OF THE SITE’S PROMINENT POSITION.

- 14.4 The operational requirements of the Port shall be kept under review to ensure that the Port of Gibraltar can compete effectively in the shipping market. In particular, there may be a need to create more land area within the Port to enable the more efficient and effective handling of vessels and cargo.

POLICY Z3.4 – PORT OPERATION REQUIREMENTS

THE OPERATIONAL REQUIREMENTS OF THE PORT SHALL BE KEPT UNDER THE REVIEW.

- 14.5 In addition to commercial shipping activities the port also contains Gibraltar’s cruise terminal. The Government has invested in the refurbishment of the terminal and has plans to further extend the facility. The southern end of the existing building which houses the Cruise Terminal is occupied by an existing port operator for storage purposes. The Government will seek to relocate this use elsewhere within the Port to enable this area to accommodate an extension to the existing terminal.

POLICY Z3.5 – EXTENSION OF CRUISE TERMINAL

THE CRUISE TERMINAL IS HOUSED WITHIN A LARGER BUILDING. THE REMAINDER OF THIS BUILDING, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR USE AS AN EXTENSION TO THE CRUISE TERMINAL.

HM Naval Base

- 14.6 The MOD has been concentrating its activities into two main areas, the Naval Base and North Front, for a number of years now. It is therefore unlikely that land within the Naval Base will become surplus to their needs during the life of the Plan. However, should any land become available it would provide a much needed opportunity to provide land/premises for employment use.

- 14.7 The MOD's electricity generating station is located within the Naval Base. This station causes a noise nuisance to residential areas nearby, particularly on Rosia Road. However, the Government's proposed new power station would also serve the electrical generation requirements of the MOD and once operational the existing station would become redundant.
- 14.8 Whilst the MOD is exempt from the normal planning process the Government shall seek to ensure that the MOD consult with the relevant Government departments and the Development and Planning Commission on any new development proposals.

New Harbours Industrial Estate/Europa Business Centre

- 14.9 These two industrial areas were developed during the 1990s providing much needed premises for warehousing, light industrial use and office space.
- 14.10 Within the Europa Business Centre is the OESCO generating station. Recent improvements to the sound insulation of the facility have reduced noise emissions to the benefit of residents of the local area. The proposed new power station, as described later in this Part, is intended to meet all Gibraltar's electrical generation requirements and once operational will mean that the OESCO station will no longer be required and the site will be available for alternative uses.

Ship Repair Yard

- 14.11 The ship repair yard is an important facility for Gibraltar and is important in attracting business to Gibraltar. The yard offers three dry docks, 3500 m² of workshops and 900 metres of deep wharfage. In 2000, a fully retractable cover was installed over No. 3 dock to provide a dedicated facility for super yachts making this the largest covered facility in the Mediterranean.
- 14.12 Development within the ship repair yard will normally be acceptable where it is required for uses directly related to the yard and subject to it not having a significant detrimental impact on any historical building or structure, and subject to a review of the impact of noise, air and water pollution.

POLICY Z3.6 – SHIP REPAIR YARD

WITHIN THE SHIP REPAIR YARD PROPOSALS FOR DEVELOPMENT DIRECTLY RELATED TO THE OPERATION OF THE SHIP REPAIR YARD SHALL NORMALLY BE PERMITTED PROVIDED THERE IS NO SIGNIFICANT DETRIMENTAL IMPACT ON ANY BUILDING OR STRUCTURE OF HISTORICAL VALUE AND SUBJECT TO A REVIEW OF THE IMPACTS OF NOISE, AIR AND WATER POLLUTION.

15 ZONE 4 — EASTSIDE

General

- 15.0 This zone extends from Eastern Beach in the North to Europa Advance Road in the South. It contains Gibraltar's eastside beaches, the prehistoric sand dunes previously covered by the water catchments, the lower shores of the Rock and the small-developed areas of Catalan Bay and Sandy Bay. In contrast to the west side, this side of the Rock has been largely left undeveloped. The natural coastline, particularly south of Catalan Bay remains largely intact.
- 15.1 Although covering a relatively large geographic area this zone had a population of only 429 people at the time of the 2001 census, almost all of whom are concentrated at Catalan Bay village and Both Worlds. One of Gibraltar's main hotels is also located within the zone at the southern end of Catalan Bay.
- 15.2 Between Catalan Bay and Eastern Beach is an area that has been used for a number of years, for the disposal of inert construction waste.

The Eastside development

- 15.3 The construction waste site has been identified as a site for a major mixed development and the zone will therefore be the location for major growth during the Plan period.
- 15.4 The proposed development for the construction waste site is a mixed development of residential, commercial, tourist and recreation/leisure use including yacht marina.
- 15.5 The site shall be serviced by a direct access from Devil's Tower Road, most likely from a new junction at the existing Eastern Beach/Devil's Tower Road junction. Proposals for improvements to Devil's Tower Road together with the proposed new route to the airport/frontier should ensure that the site is easily accessible.
- 15.6 It is envisaged that the development of this site will provide an attractive environment in which to live, and will also act as a major tourist and recreational/leisure attraction. The location of the site, situated to the south of Eastern Beach and north of Catalan Bay, offers a unique opportunity to create a continuous waterfront promenade linking Eastern Beach to Catalan Bay. Such a promenade would be a valuable recreational and leisure resource for residents and visitors. It is therefore essential to ensure that provision is made for such a promenade at the early design stage for the development of the construction waste site.
- 15.7 The development of the construction waste site offers the opportunity to provide a comprehensively planned and designed urban development. Set against the backdrop of the dramatic cliff face the design of this development should make a dramatic contemporary architectural statement and be a reflection of confidence in Gibraltar. The urban design of this site, the layout, form of buildings, provision of public open space, the interrelationship between buildings and space, the architectural treatment of buildings, will all be expected to be of the highest standard, in order to achieve a development that will be impressive and positively enhance the image of Gibraltar worldwide.

POLICY Z4.1 – THE EASTSIDE PROJECT

A SITE OF APPROXIMATELY 16HA, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR A MIXED DEVELOPMENT COMPRISING RESIDENTIAL, COMMERCIAL, TOURISM, RECREATIONAL, AND LEISURE USES INCLUDING YACHT MARINA. ANY PROPOSED DEVELOPMENT IS EXPECTED TO MAKE PROVISION FOR:

- A) A WATERFRONT PROMENADE TO CATER FOR PEDESTRIANS AND CYCLISTS, TO PROVIDE A CONTINUOUS PROMENADE WITH EASTERN BEACH TO THE NORTH AND CATALAN BAY TO THE SOUTH;*
- B) PUBLIC CAR PARKING FACILITIES TO MEET THE REQUIREMENTS OF THE DEVELOPMENT TOGETHER WITH PUBLIC CAR PARKING TO SERVE AS BEACH CAR PARKING;*
- C) ADEQUATE PROVISION FOR PUBLIC TRANSPORT FACILITIES AND FOR PEDESTRIAN AND CYCLE MOVEMENT WITHIN THE DEVELOPMENT; AND*
- D) THE URBAN DESIGN ASPECTS OF THE DEVELOPMENT TOGETHER WITH THE ARCHITECTURAL TREATMENT OF THE INDIVIDUAL BUILDINGS ARE EXPECTED TO BE OF THE HIGHEST QUALITY AND OF A CONTEMPORARY NATURE.*

Eastern Beach/Catalan Bay

15.8 The leisure and recreation section of Part I of the Plan has already made reference to the proposed replenishment of the beaches at Eastern Beach and Catalan Bay. The proposal involves the construction of underwater breakwaters and the subsequent deposit of sand to the landward side to create much larger beaches at both Eastern Beach and Catalan Bay. Studies have been undertaken to ensure that the proposed works would be sustainable in the long term so that the newly extended beaches are not gradually eroded by the action of the sea.

15.9 The creation of larger beaches will represent a great improvement and provide recreational beaches that would compare favourably with the beaches of the neighbouring Costa Del Sol. This would be of benefit to residents of Gibraltar and would also assist in the promotion of Gibraltar as a tourist destination.

15.10 The replenishment of the beaches is however, only part of the strategy to improve Gibraltar's beach facilities. Linked to the beach replenishment plan is the need to improve the general environment bordering the beaches and to create areas that act as attractions throughout the year. Thus, it is proposed that an environmental improvement scheme be prepared for Eastern Beach. This scheme will aim to create an attractive promenade that will need to link into that proposed for the construction waste site, introduce appropriate landscaping, both soft and hard, and create the opportunity for bars and restaurants to be established along the beach front. The viability of introducing dedicated beach-playing areas for activities

such as beach volleyball and football with associated facilities will also be assessed as part of the scheme. In the case of Catalan Bay, environmental improvement schemes have recently been completed.

POLICY Z4.2 – EASTERN BEACH – ENVIRONMENTAL IMPROVEMENT

AN ENVIRONMENTAL IMPROVEMENT SCHEME SHALL BE PREPARED FOR EASTERN BEACH.

POLICY Z4.3 – EASTERN BEACH – COMMERCIAL DEVELOPMENT

PROPOSALS FOR LIMITED COMMERCIAL DEVELOPMENT ALONG THE PROPOSED PROMENADE AT EASTERN BEACH WILL BE PERMITTED PROVIDED THAT THE PROPOSAL IS SYMPATHETIC TO ITS BEACH SIDE LOCATION BY VIRTUE OF ITS DESIGN, SCALE, FORM, COLOUR AND USE OF MATERIALS.

Sandy Bay

- 15.11 The area of Sandy Bay has remained largely undeveloped other than the Both Worlds complex built in the 1970s as an apart hotel. The complex has now been refurbished and converted into a mixed residential retirement complex and open market housing. The occupation of the complex on a more permanent basis has resulted in a serious shortage of car parking in the area. During the summer season this problem is exacerbated by the increased demand arising from beach goers.
- 15.12 The developer of the refurbished Both Worlds complex has proposed the provision of car parking to satisfy the demands for the complex. A site has been identified at the southern end of the complex for a multi-storey car park for this purpose. Any provision over and above the residential requirement should be made available for use by beach goers. The site is however, on the beachfront and as such it shall be a requirement that the design of the car park is sensitive to this setting.

POLICY Z4.4 – BOTH WORLDS CAR PARK

A SITE IS IDENTIFIED AT THE SOUTHERN END OF THE EXISTING BOTH WORLDS COMPLEX, AS SHOWN ON THE PROPOSALS MAP, FOR USE AS A MULTI STOREY CAR PARK PRIMARILY FOR USE BY RESIDENTS OF BOTH WORLDS, SUBJECT TO THE DESIGN OF THE BUILDING BEING SYMPATHETIC TO ITS SURROUNDINGS, PARTICULARLY ITS BEACHFRONT LOCATION. ANY PARKING PROVISION IN EXCESS OF THE RESIDENTIAL REQUIREMENT SHALL BE MADE AVAILABLE FOR USE BY BEACH GOERS.

- 15.13 An area of land to the west of Sir Herbert Miles Road is the subject of historical development rights granted by the Government for residential use. Any proposal for this site however, would have to pay particular attention to the natural setting of the site, the potential visual impact of any proposed development and the risk of rock falls and land slides in the area.

15.14 Following a fatality as a result of a rock fall in 2002 that occurred at the entrance to Dudley Ward Tunnel, the Government commissioned an assessment of the cliff face in the area. As a result of this assessment the Government will be carrying out works to reduce risks to an acceptable level and will include the construction of a protective structure wherever this is considered necessary. The design of this structure will need to ensure that there is minimal impact on the environment.

The Great Sand Slopes

15.15 The eastern slopes of the Rock were once used as water catchments and were Gibraltar's main source of potable water. The catchments comprised corrugated sheeting placed over the existing sand dune. As the maintenance of the catchments became increasingly uneconomical alternative means of water production were explored leading to the introduction of water desalination as the best way for Gibraltar to ensure constant potable water supplies. Consequently the catchments became redundant and have now been removed and the exposed area replanted to allow its reversion to its natural state. In ecological terms this project has provided an important new habitat for flora and fauna with many new species having been established in the area since the rehabilitation works started. The slopes lie within the Upper Rock Site of Community Importance. Due to the ecological importance of the sand slopes, their undeveloped state and the difficulties associated with the stability of the slopes, no development will be permitted on the slopes, with the possible exception of the site west of Sir Herbert Miles Road referred to earlier in this section.

POLICY Z4.5 – THE WATER CATCHMENTS

WITHIN THE AREA OF THE CATCHMENTS AS DEFINED ON THE PROPOSALS MAP, PLANNING PERMISSION WILL NOT BE GRANTED FOR ANY DEVELOPMENT.

16 ZONE 5 — NORTH FRONT

General

16.0 This zone covers the narrow isthmus that separates Gibraltar from Spain. It is centred on the airport and adjacent MOD areas and includes Western Beach.

The Airport/Frontier

16.1 The airport is a joint military/civilian airport. There are currently daily scheduled flights to the UK and Spain. Arrivals by air have been gradually increasing since a low of 70,000 in 1994 and reaching almost 165,000 in 2008¹.

16.2 The Transport section of Part I of this Plan made reference to the Cordoba Agreement of September 2006 to which the Gibraltar, British and Spanish Governments are all parties. Amongst other matters the agreement allowed for the enhanced use of the airport the practical consequence of which will be the need to upgrade the facilities at Gibraltar Airport.

16.3 Construction has commenced on a new larger terminal that will handle all airport, passenger and flight services. It is envisaged that the terminal will also make appropriate provision for bus, taxi and car parking facilities. The new terminal will be physically linked to the edge of the frontier fence to enable passengers from Spain access to and from the terminal.

POLICY Z5.1 - AIRPORT

LAND IS ALLOCATED FOR THE CONSTRUCTION OF A NEW AIR TERMINAL INCLUDING AIR SIDE FACILITIES AND OTHER ANCILLARY AIRPORT USES. THE TERMINAL SHALL HAVE A PHYSICAL LINK TO THE EDGE OF THE FRONTIER FENCE.

16.4 In the long term, the current access arrangements to both the airport and frontier, involving the crossing of the runway by both vehicles and pedestrians, would not be compatible with increased use of the airport. The Government will therefore be providing an alternative access route. This route will run under the eastern end of the runway within a tunnel emerging in the vicinity of the Aerial Farm where it will link to Devil's Tower Road, which it is proposed to upgrade. Construction work on this new road has now commenced.

POLICY Z5.2 – NEW AIRPORT/FRONTIER ACCESS ROAD

A NEW AIRPORT/FRONTIER ROAD SHALL BE CONSTRUCTED AS SHOWN ON THE PROPOSALS MAP. IT IS ENVISAGED THAT THIS ROAD SHALL CROSS UNDER THE RUNWAY AT ITS EASTERN END AND SHALL CONNECT TO DEVIL'S TOWER ROAD.

AS PART OF THE DESIGN OF THE ABOVE ROAD PROPOSALS THE OPPORTUNITY SHALL BE TAKEN TO RATIONALISE THE VARIOUS COMMERCIAL GOODS CLEARANCE ACTIVITIES AT THE FRONTIER INCLUDING LORRY PARKING AND CUSTOMS AND CLEARING AGENTS FACILITIES.

¹ Tourist Survey Report 2008

- 16.5 Immediately west of Sir Winston Churchill Avenue and North of the runway is the site of the existing Rotunda Shopping Centre. This centre is largely vacant and has been for a number of years. The owners of the site have submitted an outline planning application for a redevelopment scheme comprising an apart-hotel with retail use and basement car parking that is currently going through the planning process. However, the location of the site adjacent to the airport and in close proximity to the frontier, and close to a possible land reclamation site at Western Beach means that the site could also be suitable for a variety of uses including light industrial/storage, office, retail and car parking.
- 16.6 The site is fronted by Sir Winston Churchill Avenue to the east and the runway to the south and is almost opposite the air terminal. As such, the site is prominently situated and any proposal will need to ensure that the form and architectural treatment of the proposed development enhances the overall appearance of the area.
- 16.7 The proximity of the site to the runway also means that airfield safety and operating requirements will need to be taken into account in formulating the design.

POLICY Z5.3 - SITE OF ROTUNDA SHOPPING CENTRE

PROPOSALS FOR THE REDEVELOPMENT OF THE SITE OF THE ROTUNDA SHOPPING CENTRE, SIR WINSTON CHURCHILL AVENUE, WILL BE FAVOURABLY CONSIDERED. APPROPRIATE POSSIBLE USES INCLUDE, BUT ARE NOT LIMITED TO, HOTEL USE, RETAIL, AND LIGHT INDUSTRY/STORAGE. ANY PROPOSAL WILL NEED TO ENSURE THAT THE DESIGN OF ANY SCHEME TAKES ACCOUNT OF:

- A) THE PROMINENT NATURE OF THE SITE ADJACENT TO THE RUNWAY AND OPPOSITE THE AIR TERMINAL, AND***
- B) THE PROXIMITY OF THE SITE TO THE RUNWAY AND ANY CONSEQUENT AIRFIELD SAFETY REQUIREMENTS.***

Western Beach – reclamation

- 16.8 It has been recognised that there is a need for land for open storage use. Currently such uses are distributed throughout various sites in Gibraltar and it is considered that if a single site could be created for such uses it would be of benefit to the operators of these sites as well as releasing numerous sites which could be better utilised. In addition the need for yacht repair and associated facilities to cater for both visiting and local yachts and boats has been recognised. Furthermore and notwithstanding the proposal to provide a small boats mooring at Coaling Island, there remains a need for additional mooring facilities for small boats.
- 16.9 In response to the above demands for land an assessment of the feasibility of carrying out a land reclamation project off the area of Western Beach shall be undertaken. This would create a suitable waterside facility together with a large area of land that would be suitable for open storage use. The proximity of the site to the airfield means that it is subject to strict

height limitations and the proposed open storage use would be one of the few potential uses of land in this area. Furthermore, the site has specific locational benefits being situated close to the land frontier. Goods arriving by road across the land frontier can easily be delivered to the site without the need to travel through other parts of Gibraltar thereby minimising the impact on the existing road network and traffic levels. Careful consideration would need to be given to the possible impact of any such reclamation on Western Beach and the compatibility of any proposed uses with the safe operation of the airport and with the protection of biodiversity.

POLICY Z5.4 – WESTERN BEACH

THE FEASIBILITY OF A LAND RECLAMATION PROJECT OFF WESTERN BEACH, AS SHOWN ON THE PROPOSALS MAP, WILL BE UNDERTAKEN. CAREFUL CONSIDERATION WILL NEED TO BE GIVEN, IN PARTICULAR, TO:

- A) POTENTIAL IMPACT ON WESTERN BEACH; AND***
- B) COMPATIBILITY OF PROPOSED USES WITH THE SAFE OPERATION OF THE AIRPORT.***

Aerial Farm

- 16.10 As part of the land agreement on the transfer of land from the MOD to the Government the majority of the site of the Aerial Farm has been returned to the Government.
- 16.11 Immediately to the north of this site the MOD is constructing an integrated health care facility and a new sports and recreational facility. To the east is Eastern Beach where environmental improvements are planned and to the southeast is the boundary of the Eastside development where a mixed development comprising residential, commercial and marina shall be developed.
- 16.12 Part of the site will be required for the proposed new airport/frontier route however the remainder of the land could be appropriate for a number of uses such as residential, recreational, leisure, tourist, office and public parking. Until the exact extent of land available for development is known it is considered appropriate to apply a policy that would safeguard the land from permanent development.

POLICY Z5.5 – THE AERIAL FARM

THE FUTURE USE OF THIS SITE WILL BE DETERMINED ONCE THE AIRPORT/ FRONTIER ROUTE AND THE IMPROVEMENT TO DEVIL'S TOWER ROAD HAVE BEEN FULLY DEVELOPED.

- 16.13 The Aerial Farm is known to contain a number of plant and animal species of conservation value including the Sea Daffodil and a declining species of beetle that provide a food source for various bird species including Little Owls. Prior to any development of the site there should be a planned programme of translocation of some of this flora and fauna to alternative sites such as the ex-MOD wireless station site, the Great Sand Slopes, Talus and Cemetery.

17 ZONE 6 — NORTH DISTRICT

General

17.0 This zone extends from Glacis Estate in the west to the entrance to Eastern Beach in the east. It contains a mix of residential uses, commercial, storage and light industrial. The Laguna and Glacis estates are long established residential areas having been developed in the 1950s and 1960s respectively. The area bounding both sides of Devil's Tower Road has traditionally been used for industrial and storage uses with some residential and commercial uses interspersed amongst them. During the period of the 1991 Plan additional residential development has taken place along Devil's Tower Road, particularly Wellington Court and Northview Terrace.

Devil's Tower Road

17.1 Devil's Tower Road is the only access route to the eastern side of the Rock providing access to the beaches and the residential developments at Catalan Bay and Both Worlds. The appearance of the area has always suffered from the concentration of industrial uses in the area and their associated activities. During the 1990s some of these uses relocated out of the area to more appropriate premises in some of the industrial estates that have been developed. In recent years, the area has seen a number of commercial uses moving in, particularly car showrooms that have helped to improve the frontages to Devil's Tower Road.

17.2 The proposed new access to the airport and land frontier is to be routed around the eastern end of the runway and feed into Devil's Tower Road. In addition Devil's Tower Road will become the main access road to the eastside construction waste development site. As a consequence there is a need to increase the carrying capacity of this road and the feasibility of widening the road to accommodate two lanes in each direction is being investigated. Due to the limited space available it is likely that any such road widening will necessitate the removal of much of the existing on-street car parking and there will therefore be a need to re-provide this parking within the general area. Such a road-widening scheme shall also offer the opportunity for environmental improvement as part of a comprehensive road scheme.

17.3 The policy objectives for the area are therefore to:

- Encourage residential development along Devil's Tower Road;
- Encourage existing industrial, commercial and storage uses, particularly those fronting Devil's Tower Road, to re-locate to more appropriate locations;
- Any new industrial/storage uses should be limited to sites to the rear of frontage properties and adequate provision for parking and service areas should be provided within the site;
- Avoid the introduction of any heavily industrial uses into the area;
- Implement a comprehensive road improvement scheme incorporating road widening, environmental improvement and re-provision of public car parking.

POLICY Z6.1 – DEVELOPMENT FRONTING DEVIL’S TOWER ROAD

PROPOSALS FOR RESIDENTIAL DEVELOPMENT FRONTING DEVIL’S TOWER ROAD WILL NORMALLY BE GIVEN FAVOURABLE CONSIDERATION.

POLICY Z6.2 – INDUSTRIAL/STORAGE USE

PROPOSALS FOR NEW LIGHT INDUSTRIAL OR STORAGE USES WILL ONLY BE PERMITTED WHERE:

- A) THEY ARE LOCATED TO THE REAR OF PROPERTY FRONTING ONTO DEVIL’S TOWER ROAD;*
- B) ADEQUATE CAR PARKING AND SERVICE AREAS ARE PROVIDED WITHIN THE SITE: AND*
- C) THERE IS NO UNACCEPTABLE ADVERSE EFFECT ON THE AMENITIES OF ADJACENT USERS, PARTICULARLY RESIDENTIAL.*

POLICY Z6.3 – ROAD IMPROVEMENT

A COMPREHENSIVE ROAD IMPROVEMENT SCHEME SHALL BE DESIGNED AND IMPLEMENTED FOR DEVIL’S TOWER ROAD AND SHALL INCLUDE ROAD WIDENING, ENVIRONMENTAL IMPROVEMENT AND RE-PROVISION OF PUBLIC PARKING.

- 17.4 The site of the ex-hostel and MOD Quartermasters/Royal Gibraltar Regiment depot have already been identified as appropriate sites for multi-storey car parks. Construction work on a multi-storey car park has now commenced on the latter of these two sites. In respect of the former, the Plan makes provision for use of the site as a car park.

POLICY Z6.4 –DEVIL’S TOWER ROAD CAR PARK

THE SITE OF THE EX-HOSTEL, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR CAR PARK USE.

- 17.5 With the proposed routing of the new frontier/airport road through Devil’s Tower Road the opportunity has been taken, as proposed in the earlier Consultation Draft of this Plan, to provide a ‘park and ride’ scheme on Devil’s Tower Road where tourists arriving by private car could leave their vehicles and transfer to a bus or taxi. Such a facility would assist in keeping tourist traffic well away from the town area. The facility is to be provided within the multi-storey car park currently under construction on the site of the ex-MOD Quartermasters and Royal Gibraltar Depot as referred in the above section.

- 17.6 It is considered that the park and ride scheme could also potentially service the beaches at Catalan Bay and Sandy Bay during the summer months by providing a shuttle bus service for beach users.

Cemetery

- 17.7 There is agreement between the Government and MOD for the transfer of an area land adjacent to the cemetery to the Government. The intention is to utilise this land as an extension to the existing cemetery. Appropriate landscaping shall be incorporated into any extension to the cemetery.

POLICY Z6.5- EXTENSION TO CEMETERY

AN AREA OF LAND TO BE TRANSFERRED FROM THE MOD TO THE GOVERNMENT ADJACENT TO THE CEMETERY SHALL BE USED AS AN EXTENSION TO THE CEMETERY. THE DESIGN OF ANY SUCH EXTENSION SHALL INCORPORATE APPROPRIATE LANDSCAPING.

- 17.8 The Cemetery is of ecological importance providing a habitat similar to meadow as well as harbouring one of the last areas of sandy isthmus habitat. The uniqueness of these habitats is reflected in the flora and fauna found in the area. The site hosts rare plant species (e.g. Sea Daffodil) and invertebrate fauna, and is an important site for migrating songbirds and for other bird species such as Hoopoes, Red-necked nightjars, and Scops Owls.
- 17.9 To ensure that the ecological importance of the site is properly maintained it is considered that an appropriate long-term environmental management plan should be devised and implemented. Such a plan would benefit Gibraltar's biodiversity and would also result in aesthetic improvements to the cemetery that would be of benefit to visitors.

POLICY Z6.6- CEMETERY - ENVIRONMENTAL MANAGEMENT PLAN

AN ENVIRONMENTAL MANAGEMENT PLAN SHALL BE PREPARED AND IMPLEMENTED FOR THE CEMETERY.

18 Zone 7 - Europa

General

- 18.0 This zone extends from Europa Point in the South to Lathbury Barracks in the North and is bounded on its south, east and west sides by the coastline. In general terms the zone contains a mix of land uses including residential, recreational, industrial and MOD estate.
- 18.1 At a more localised level land use within the zone varies. In this respect, the area of Europa Advance Road on top of the east side sea cliffs and the Lathbury Barracks area situated on the higher plateau above, are one of the few areas of Gibraltar that are sparsely populated. The other significant sparsely populated area being the Upper Rock that is largely protected due to its ecological and recreational value and is a designated Nature Reserve. In addition, this part of the zone has previously seen development that could be termed as 'bad neighbour development'.
- 18.2 The Plan needs to make adequate provision for a number of bad neighbour developments, namely sites for a wastewater treatment works, refurbished energy from waste facility, and electrical generating station. In the case of the wastewater treatment works the choice of its location is geographically limited due to its need to be located at the outlet of Gibraltar's sewerage network i.e. Europa Point. Taking into account the context of the area as described above and the geographical limitation on the location of the wastewater treatment works, a strategy of concentration has been adopted for the location of such uses. The benefit of this strategy is that the negative effects of this type of development particularly noise, odour and emissions, are concentrated in an area where their impact on local residents will be minimised. However, it is acknowledged that the cumulative impact of such concentration may be greater than if a dispersal strategy were adopted. It will therefore be necessary to ensure that the adverse effects of these developments are carefully assessed including the potential for cumulative effects.
- 18.3 Clearly, one of the effects of these types of development is the visual impact. In particular, careful attention will need to be paid to the impact of some of these developments from the sea, and from the area of Europa Point which is a tourist destination and which, as set out below, is proposed for environmental improvement.

Europa Point

- 18.4 Europa Point is a major tourist destination and consequently is included in most tourist itineraries. It is a largely open area dominated by the Trinity lighthouse and providing magnificent views of the North African coastline. The area has historic significance as well with defensive walls and batteries situated along the cliff top and the site of Nun's Well nearby.
- 18.5 Areas of Europa Point also provide valuable habitat for important plant species. Furthermore, located at the southern end of the Rock it is also an important location for bird watching being directly located on important bird migration routes.
- 18.6 The area is also heavily used by local residents for recreational purposes.

18.7 The area is in need of environmental improvement and the Government is committed to undertaking an appropriate scheme to improve the area to the benefit of tourists and residents.

POLICY Z7.1 – EUROPA POINT ENVIRONMENTAL IMPROVEMENT

AN ENVIRONMENTAL IMPROVEMENT SCHEME SHALL BE IMPLEMENTED FOR THE EUROPA POINT AREA AS SHOWN ON THE PROPOSALS MAP AND SHALL PAY PARTICULAR REGARD TO PROVIDING:

- A) AN ATTRACTIVE ENVIRONMENT;***
- B) APPROPRIATE TOURIST FACILITIES;***
- C) INTERPRETATION OF HISTORIC AND NATURAL FEATURES AND INTERPRETATION OF THE NATURE CONSERVATION VALUE OF THE SITE; AND***
- D) RECREATIONAL FACILITIES.***

18.8 Gibraltar's sewage outlet is situated at Europa Point. The Government is to provide a new Waste Water Treatment Works in the area to ensure that sewage is properly treated before entering the sea and the plant shall meet the requirements of EU Directives, in particular the Urban Waste Water Treatment Directive.

18.9 The plant shall be located on the site of the Brewery Crusher. The site is situated at a lower level than the road and part of the plant shall be situated within existing caverns. In addition, appropriate screening and landscaping of the site shall be included to further reduce any possible visual impact. The proposed development of the wastewater treatment works is likely to require both an EIA and Appropriate Assessment to fully assess any potential significant environmental effects arising from the development.

POLICY Z7.2 – WASTE WATER TREATMENT WORKS

THE SITE OF THE EX BREWERY CRUSHER, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR THE DEVELOPMENT OF A WASTE WATER TREATMENT WORKS.

Europa Advance Road

18.10 An area of land west of Europa Advance Road has previously been developed for industrial purposes including an energy from waste facility that is no longer operative.

18.11 The Government is to refurbish the existing energy from waste facility to enable thermal destruction of municipal solid waste and sewage sludge. It is proposed that energy recovery from the plant will be used to:

- i) Produce up to 200,000m³ of potable water by thermal desalination;
- ii) Dry approximately 1100 tonnes of sewage sludge per year for thermal destruction. The sewage sludge shall be supplied from the proposed new wastewater treatment works to be built at the nearby Brewery Crusher site as detailed in the preceding policy.

18.12 The proposed refurbishment of the energy from waste facility is likely to require an EIA and Appropriate Assessment to fully assess any potential significant environmental effects arising from the development. In particular, consideration will need to be given to wind direction, height of plumes and adjacent land uses within the direction of the prevailing wind.

POLICY Z7.3 – ENERGY FROM WASTE FACILITY

THE EXISTING ENERGY FROM WASTE FACILITY SHALL BE REFURBISHED.

18.13 Immediately to the south of the existing energy from waste facility is a site known as Governor's Cottage. The Government identified this site for use as a clinical waste incinerator and crematorium. The facility has now been completed and is in operation.

18.14 Whilst the clinical waste incinerator and crematorium share the same site and there is some sharing of plant, the two facilities are operated independently from each other.

Lathbury Barracks

18.15 A mix of telecommunication and industrial development has taken place on the site of the former army quarters and associated buildings. The Government has provided a total of 28 industrial units in Phase 1 of the Lathbury Barracks Industrial Estate and a second phase is planned to provide additional units.

POLICY Z7.4 – LATHBURY BARRACKS - INDUSTRIAL ESTATE

SOME 0.2HA OF LAND IS ALLOCATED AS AN EXTENSION TO THE EXISTING INDUSTRIAL ESTATE FOR LIGHT INDUSTRIAL/STORAGE/WAREHOUSING USE.

18.16 The Lathbury Barracks guardroom complex is currently lying vacant and has redevelopment potential. Any proposal would need to be sensitive to its location but it is considered that this site could be used for light industrial use or storage and warehousing.

POLICY Z7.5 – LATHBURY BARRACKS GUARDROOM COMPLEX

THE SITE OF THE LATHBURY BARRACKS GUARDROOM COMPLEX COMPRISING APPROXIMATELY 0.18HA, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR LIGHT INDUSTRIAL/STORAGE/WAREHOUSING USE.

- 18.17 To the east of the guardroom complex and south of the industrial estate is the Retrenchment Block. The Government identified this building as being suitable for the accommodation of sports and leisure clubs and associations. The building has been sensitively refurbished and will provide accommodation for a variety of clubs and associations.
- 18.18 To the north of the existing first phase of the industrial estate are two areas of land either side of Windmill Hill Road, previously used as residential quarters for the military. The site to the west of Windmill Hill Road has recently been developed for residential use whilst the site to the east has outline planning permission for use as a residential care and nursing home.

Site for HM Prison

- 18.19 An area of land to the east of the ex-Junior Ranks Mess site was identified as being a suitable site for the relocation of the Prison and the new building is substantially complete. The extent of the site is shown on the proposals map.
- 18.20 In considering development proposals in the vicinity of the new prison special consideration shall be given to any security issues that the new development may have for the prison.

POLICY Z7.6 – PROPOSALS AFFECTING HMP

IN CONSIDERING DEVELOPMENT PROPOSALS IN THE VICINITY OF THE PRISON SPECIAL CONSIDERATION SHALL BE GIVEN TO ANY SECURITY IMPLICATIONS OF THE NEW DEVELOPMENT IN RELATION TO THE PRISON. PERMISSION WILL NOT BE GRANTED WHERE THE PROPOSAL IS CONSIDERED TO JEOPARDISE THE SECURITY OF THE PRISON.

Windmill Hill Road

- 18.21 The road leading from the junction with Europa Road to Jews Gate within the Upper Rock Nature Reserve is considered to provide a better access route to the Upper Rock Nature Reserve than the current access along Engineer Road. All development proposals will need to take this into account and no development shall be permitted that would prejudice the use of this road as the main access road to the Nature Reserve.

POLICY Z7.7 – WINDMILL HILL ROAD

WINDMILL HILL ROAD, AS SHOWN ON THE PROPOSALS MAP, SHALL BE USED AS THE MAIN ACCESS ROAD TO THE UPPER ROCK NATURE RESERVE. NO DEVELOPMENT SHALL BE PERMITTED THAT WOULD PREJUDICE THE USE OF THIS ROAD AS THE MAIN ACCESS ROUTE. THE DESIGN OF ANY DEVELOPMENT IN THIS AREA WILL NEED TO TAKE INTO ACCOUNT THE FACT THAT THIS SHALL BE THE MAIN APPROACH TO THE NATURE RESERVE.

Lathbury Barracks Parade Ground

- 18.22 As set out in the ‘Utilities and Waste’ chapter of Part I of the Plan, the Government has decided to construct a new power station to replace the existing Government facility at Waterport, the private OESCO station and the MOD station at the Dockyard. The current proposal under consideration is for a 42 megawatt plant but with room for future expansion up to 70 megawatts should this be necessary.
- 18.23 The Parade Ground has been identified by the Government for this purpose and detailed assessments, including both an Environmental Impact Assessment and an Appropriate Assessment of any potential environmental impacts, have been carried out.
- 18.24 As with other developments in this area, the design of the station will need to take account, as far as is practicable, of the setting, being in close proximity to historical defensive walls and to the Upper Rock Nature Reserve.
- 18.25 The Plan makes provision for a number of uses in the Lathbury area whilst acknowledging the particular sensitivities of the site in relation to its proximity to the historic structures in the area and to the Upper Rock Nature Reserve. In this context it is important to note the inter-relationships that exist between the fauna and flora of Windmill Hill and the Upper Rock. In particular, there is the potential to isolate the natural populations of Windmill Hill, notably the Barbary Partridge and Red Fox (currently part of a re-introduction programme) from the Upper Rock. In the future development of the area the Development and Planning Commission shall seek to ensure that where appropriate green corridors and green or brown roofs are provided to assist in maintaining the natural links between the two areas.

POLICY Z7.8 – LATHBURY – NATURAL LINKAGES

THE DEVELOPMENT AND PLANNING COMMISSION SHALL SEEK TO ENSURE THAT APPROPRIATE PROVISION IS MADE IN FUTURE DEVELOPMENT IN THE LATHBURY BARRACKS AREA FOR GREEN CORRIDORS AND GREEN OR BROWN ROOFS TO ASSIST IN MAINTAINING THE NATURAL LINKAGES BETWEEN WINDMILL HILL AND THE UPPER ROCK.

19 ZONE 8 — SOUTH DISTRICT

General

19.0 This zone extends from Charles V wall at the southern end of the zone to Little Bay at its northern end. The land use pattern of the zone is predominantly residential together with significant recreation and leisure uses at the Alameda Gardens and along the coastline at Rosia Bay, Camp Bay and Little Bay.

Alameda Gardens

- 19.1 The botanical gardens were opened in 1816 and provide an attractive area of exotic plants, trees and shrubs. The gardens cover an area of some 5.5 ha and is Gibraltar's biggest park.
- 19.2 The gardens act as a 'green lung' in the otherwise built up area of the lower slopes. It is an attractive element of Gibraltar's landscape and contributes significantly towards the setting of the Upper Rock. The gardens are well used by residents for recreational and leisure purposes, as well as increasingly becoming an attraction for tourists.
- 19.3 The gardens are gaining an international reputation for its range of exotic plants and are increasingly becoming an important research centre. In addition to flora, the gardens are also developing an animal breeding centre with the purpose of re-introducing endangered Species back into Gibraltar's wild areas.
- 19.4 The gardens are therefore important in landscape, recreational, tourist, leisure, and ecological terms. The overriding objective is therefore to conserve the area and to further promote it as a both a local and visitor attraction. Development within the gardens themselves will therefore be strictly controlled and only proposals relating to the operation of the gardens or to improve its facilities and attractions will be permitted. Furthermore, development proposals in the vicinity of the gardens will be carefully assessed to ensure that there are no significant adverse effects on the gardens themselves.

POLICY Z8.1 – ALAMEDA GARDENS

THE ALAMEDA GARDENS, AS DEFINED ON THE PROPOSALS MAP, SHALL BE CONSERVED AS A MAJOR LEISURE AREA. PLANNING PERMISSION FOR NEW DEVELOPMENT WITHIN THE GARDENS WILL NOT NORMALLY BE PERMITTED EXCEPT FOR:

- A) ESSENTIAL ACTIVITIES RELATED TO THE OPERATION OF THE GARDENS;
OR**
- B) APPROPRIATE RECREATIONAL AND TOURIST USES.**

WHERE A PROPOSED USE ACCORDS WITH THE ABOVE CRITERIA ANY PROPOSED BUILDINGS OR STRUCTURES MUST MINIMISE THEIR IMPACT ON THE CHARACTER AND APPEARANCE OF THE GARDENS BY VIRTUE OF THEIR SITING, DESIGN, MASSING, SCALE, FORM, COLOUR AND USE OF MATERIAL.

POLICY Z8.2 – PROPOSALS IN THE VICINITY OF ALAMEDA GARDENS

IN CONSIDERING PROPOSALS IN THE VICINITY OF THE ALAMEDA GARDENS CONSIDERATION SHALL BE GIVEN TO THE IMPACT OF THE PROPOSED DEVELOPMENT ON THE GARDENS. WHERE SUCH IMPACT IS CONSIDERED TO BE UNACCEPTABLE PLANNING PERMISSION WILL BE REFUSED.

Grand Parade

- 19.5 To the south of Alameda Gardens is Grand Parade, currently used as a large surface car park. The car park is heavily used by residents living in the vicinity and the wider area, by people working in the Town and by tourists. Its location outside the City Walls contributes towards the aim of encouraging traffic to remain outside the Old Town.
- 19.6 The importance of Grand Parade as a car park, and as an open area that allows for an appreciation of the setting of the Alameda Gardens, is recognised and the existing use shall continue. However, it is also recognised that the car parking potential of this site could be increased through the development of underground car parking. Any such proposals would be favourably considered provided that there was no significant permanent adverse impact on the setting of the Gardens, on traffic flows in the area and that there was an overall improvement in the environment of the surface car park.

POLICY Z8.3 – GRAND PARADE

PROPOSALS FOR UNDERGROUND CAR PARKING AT GRAND PARADE WILL BE FAVOURABLY CONSIDERED PROVIDED THAT:

- A) THERE IS NO SIGNIFICANT ADVERSE IMPACT ON THE SETTING OF THE ALAMEDA GARDENS;*
- B) THERE IS NO SIGNIFICANT ADVERSE TRAFFIC IMPACT; AND*
- C) THERE IS AN OVERALL IMPROVEMENT IN THE ENVIRONMENT OF THE SURFACE CAR PARK.*

Cumberland Road/Rosia Road/Victualling Yard tanks

- 19.7 The sites of the ex- Tower and Cumberland Buildings on Rosia Road and Cumberland Road respectively, together with the ex-water tanks at the Victualling Yard are currently being developed for affordable housing.

Rosia Bay

- 19.8 Rosia Bay has significant historical importance being the bay into which HMS Victory was towed after the Battle of Trafalgar. There are two important gun batteries dating from the 18th Century sited above the bay, including Parson's Lodge which occupies a dominant position. Opposite Parson's Lodge is the Victualling Yard dating back to 1808.

- 19.9 The surrounding area is predominantly in residential use with some light industry and storage uses around the historically important Grand Magazine that fronts onto Rosia Road.
- 19.10 The area around the Grand Magazine is currently being developed for residential purposes. The scheme includes the sensitive restoration and re-use of the Grand Magazine. Rosia Bay has been identified as being suitable for redevelopment for tourist, recreation and leisure use subject to proposals being sensitive to the historical elements of the area. In keeping with the policy of opening up Gibraltar's waterfront to the general public, any proposal must ensure public access to the waterfront at Rosia Bay.

POLICY Z8.4 – ROSIA BAY

THE SITE OF ROSIA BAY, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR TOURIST, RECREATION AND LEISURE USE. ANY PROPOSAL SHALL HAVE TO:

- A) ENSURE THAT THE CHARACTER AND APPEARANCE OF ANY HISTORICAL BUILDINGS WITHIN THE AREA ARE NOT SIGNIFICANTLY DETRIMENTALLY AFFECTED; AND***
- B) PUBLIC ACCESS IS PROVIDED TO THE WATERFRONT.***

Camp Bay and Little Bay

- 19.11 Camp Bay and Little Bay are west-facing beaches and as such enjoy longer hours of sunshine as compared to the beaches on the eastern side. The beaches are well used providing an important recreational amenity particularly for residents of the South District. The beaches are also well used out of season as an open area for recreational purposes and the small ball playing area and children's park are popular.
- 19.12 Whilst both Camp and Little Bays are well used they require environmental improvement to maximise their recreational potential. An environmental scheme for Camp Bay has already been prepared implemented. A similar scheme is to be prepared for Little Bay.

POLICY Z8.5 – ENVIRONMENTAL IMPROVEMENT FOR LITTLE BAY

AN ENVIRONMENTAL IMPROVEMENT SCHEME FOR LITTLE BAY SHALL BE PREPARED.

- 19.13 The existence of steep cliffs at either end of the bays and to the rear has meant that there has been little development in this area. The planned land use for this area is to continue the existing pattern of recreational, leisure and tourist use. Only proposals that would encourage these uses will be permitted in these areas.

POLICY Z8.6 – CAMP BAY/LITTLE BAY

PLANNING PERMISSION WILL NORMALLY BE GRANTED FOR DEVELOPMENT PROPOSALS FOR TOURIST, LEISURE OR RECREATIONAL USES WITHIN THE CAMP BAY AND LITTLE BAY AREAS PROVIDED THEY ARE SENSITIVE TO THEIR SETTING.

Former Casino, Europa Road

19.14 The former Casino located at Europa Road, has recently relocated to a new site within the Ocean Village development at Marina Bay. The relocation of the Casino has resulted in the current site becoming available for an alternative use. Bearing in mind the surrounding land use pattern it is considered that a sensitively designed residential development would be appropriate. Any proposal would need to pay particular attention to the impact on the setting of the Upper Rock and the Alameda Gardens that lie east and west of the site respectively. It should also be borne in mind that the site is located immediately below an area of the upper Rock that is heavily visited by tourists and residents. It is therefore important for any proposed design to pay particular attention to the treatment of the roof area.

19.15 The site contains two saltwater reservoirs that are of strategic importance. It is essential that adequate access to the reservoirs for maintenance and operational purposes is provided and that there is no detrimental impact on the structural integrity of the reservoirs as a result of additional loading imposed by any new development above. It is therefore essential that these matters are adequately addressed, to the satisfaction of the Government, in the design of any scheme for this site.

POLICY Z8.7 – THE FORMER CASINO SITE, EUROPA ROAD

THE SITE OF THE FORMER CASINO, AS SHOWN ON THE PROPOSAL MAP, IS ALLOCATED FOR RESIDENTIAL USE. ANY PROPOSAL FOR REDEVELOPMENT WILL NEED TO PAY PARTICULAR ATTENTION TO:

- A) POSSIBLE IMPACT ON THE SETTING OF THE ADJACENT UPPER ROCK;***
- B) POSSIBLE IMPACT ON THE SETTING OF THE ADJACENT ALAMEDA GARDENS;***
- C) APPROPRIATE TREATMENT TO ALL ROOF AREAS; AND***
- D) THE NEED TO RETAIN OR RE-PROVIDE THE EXISTING WATER RESERVOIRS TO THE SATISFACTION OF THE GOVERNMENT***

IF THE RESERVOIRS ARE TO BE RETAINED, AS OPPOSED TO REPROVIDED, THE FOLLOWING ARE APPLICABLE:-

- E) THE NEED TO PROVIDE ADEQUATE ACCESS FOR MAINTENANCE AND OPERATIONAL PURPOSES TO THE SATISFACTION OF THE GOVERNMENT; AND***
- F) THE NEED TO DEMONSTRATE TO THE SATISFACTION OF THE GOVERNMENT THAT ANY PROPOSED SCHEME WILL NOT HAVE A DETRIMENTAL IMPACT ON THE STRUCTURAL INTEGRITY OF THE RESERVOIRS OR ITS WATER TIGHTNESS.***

Maida Vale, Engineer Road

19.16 The site commonly known as 'Maida Vale', accessed from Engineer Road, would be considered to lie within a buffer area adjacent to the Upper Rock Nature Reserve. However, this constitutes a 'brownfield' site where development has previously taken place. Construction started on the site in the 1960s with the construction of foundations and parts of the structure to ground floor level. Since then the site has been left dormant in an unsightly and untidy state with a consequent detrimental impact on the appearance of this part of the Nature Reserve. It is therefore proposed to allocate the site for residential development purposes. Any scheme would need to be designed carefully to ensure that the development can be assimilated successfully into the landscape.

POLICY Z8.8 - MAIDA VALE

A SITE OF APPROXIMATELY 0.3HA, AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR RESIDENTIAL PURPOSES AT MAIDA VALE. ANY SCHEME WILL NEED TO BE DESIGNED SO AS TO MINIMISE THE IMPACT ON THE LANDSCAPE AND ECOLOGY.

King George V Hospital

19.17 It is planned to relocate the existing George V psychiatric Hospital to an alternative site and it is likely therefore that the current site will be vacated during the life of the Plan. In such an eventuality it would be appropriate for the site to be redeveloped for residential purposes and the site is allocated accordingly.

POLICY Z8.9 – KING GEORGE V HOSPITAL

THE SITE OF KING GEORGE V HOSPITAL AS SHOWN ON THE PROPOSALS MAP IS ALLOCATED FOR RESIDENTIAL USE.

Buena Vista and North Gorge

19.18 Outline planning permission has been granted for the redevelopment of the site of Buena Vista Barracks and adjacent land for residential purposes. The actual Barracks building itself does not form part of the permitted development scheme and any proposals for this building would need to take account of its historical significance.

19.19 North Gorge has been identified as a suitable site on which to develop affordable housing. The Gorge is an important natural landscape feature and parts of the Gorge, particularly the cliffs contain areas of ecological value. There are also natural caves under the parts of the site and an underground cold store of heritage interest. The Plan allocates the site for residential use subject to these various matters being adequately addressed.

POLICY Z8.10–NORTH GORGE

THE SITE OF NORTH GORGE AS SHOWN ON THE PROPOSALS MAP, IS ALLOCATED FOR RESIDENTIAL USE. ANY PROPOSALS SHALL NEED TO TAKE PARTICULAR ACCOUNT OF THE POTENTIAL LANDSCAPE IMPACT, AFFECT ON NATURAL AND HISTORICAL FEATURES, NATURE CONSERVATION AFFECTS AND CLIFF STABILITY ISSUES.

The Mount

19.20 The gardens of the Mount have been an important landscape feature of Gibraltar for several hundred years with some of the individual trees within the gardens estimated at being over 500 years old. The wooded nature of the gardens is of ecological value as it supports a small community of woodland plants and animal species. The site also has great built heritage value with the original building dating from the 19th Century. The fact that the site had traditionally been home to a senior military official has helped to preserve the gardens.

19.21 Since the site was transferred to the Government by the MOD it has been used on an occasional basis for official functions, however, there is a need to secure a sustainable long-term future for the site that will conserve the buildings and the gardens. The site is considered appropriate for a wide variety of uses such as office use (for example as a corporate headquarters), recreational, tourist, research and development and educational use. The limiting factor is that any proposed use does not detrimentally affect the character or appearance of both the existing buildings and the gardens.

POLICY Z8.11- THE MOUNT

ANY DEVELOPMENT PROPOSALS FOR THE MOUNT WILL NEED TO DEMONSTRATE THAT THERE WILL BE NO ADVERSE EFFECT ON:

- A) THE CHARACTER AND APPEARANCE OF THE EXISTING BUILDINGS;*
- B) THE CHARACTER, APPEARANCE AND ECOLOGICAL VALUE OF THE SITE AND THE WIDER UPPER ROCK AREA; AND*
- C) THE SETTING OF THE EXISTING BUILDINGS OR THE GARDENS, OR THE WIDER UPPER ROCK.*

Royal Naval Hospital

19.22 The Royal Naval hospital comprises a complex of buildings dating back to the early 20th century situated on a cliff top site with panoramic views over the bay. The vast majority of the complex has been vacant for a number of years as the MOD requirement has reduced and the physical fabric of many parts of the buildings has deteriorated rapidly. The property has now been transferred to the Government and is available for alternative uses.

19.23 Due to the historical and architectural value of the hospital, the preference would be for the retention of the existing buildings and their conversion for an alternative use that respects their character and appearance. Only in the eventuality that the Government is satisfied that it would not be feasible or viable to retain the buildings would a new build scheme be considered for this site. The Government is considering options for the future use of the site including institutional uses. The re-use of the site for residential purposes would be another potential use that would offer an opportunity to provide a spectacular residential development that would fit into the predominately residential character of the area.

POLICY Z8.12 – CONVERSION/REDEVELOPMENT OF THE FORMER ROYAL NAVAL HOSPITAL

THE FORMER ROYAL NAVAL HOSPITAL IS TO BE RE-USED FOR APPROPRIATE ALTERNATIVE USES. ANY DEVELOPMENT PROPOSAL WILL NEED TO PROVIDE FOR THE RETENTION OF THE EXISTING BUILDINGS UNLESS IT CAN BE CLEARLY DEMONSTRATED THAT IT WOULD NOT BE FEASIBLE OR VIABLE TO DO SO.

ANY PROPOSAL WILL NEED TO DEMONSTRATE THAT IT HAS TAKEN INTO ACCOUNT THE SETTING OF THE SITE AND, IN THE CASE OF CONVERSION, THAT IT RESPECTS THE CHARACTER AND APPEARANCE OF THE EXISTING BUILDINGS.

20 Zone 9 – Upper Rock

General

- 20.0 The most visually prominent part of Gibraltar is the Upper Rock – a Jurassic limestone outcrop that rises to a height of 424 metres. The Upper Rock dominates virtually every vista in Gibraltar as well as being a very dominant feature in the wider landscape.
- 20.1 The eastern side of the rock comprises sheer cliffs rising up from the beaches. In contrast, the western side comprises a series of gentle undulating slopes and terraces that are accessed by a network of narrow winding roads.
- 20.2 The vast majority of the zone is uninhabited although there are a few areas of isolated development particularly around the lower slopes in the vicinity of The Mount and Devil's Gap Battery.
- 20.3 The Upper Rock is a largely unspoilt area that contains many important habitats and historical sites. The sedimentary rock is relatively rare in the region and when combined with the local climatic conditions of the 'Levanter', or east wind, it produces a unique flora and fauna.
- 20.4 The alkaline soil encourages the growth of a variety of trees, shrubs and wild flowers. By far the most extensive shrubs are the wild olive, but there are other aromatic species such as Rosemary and Thyme.
- 20.5 The Gibraltar Biodiversity Project that started in 2004 and aims to identify and systematically categorise all Gibraltar's flora and fauna, has identified over 600 species of flora, the vast majority of which are found in the Upper Rock.
- 20.6 The area is of international importance for its birdlife, particularly in terms of migrating birds. During the main migration seasons (end of February to mid-May and end of August to beginning of November) many species of bird can be observed migrating north/south. In addition to migrating species there are important resident species including the Mediterranean Shag, Barbary Partridge and Peregrine Falcon.
- 20.7 The Upper Rock is also the home of the world-famous Barbary Apes that roam the area wild, but there are also many other mammals and reptiles found in the area, such as bats and lizards.
- 20.8 In addition to the flora and fauna, the Upper Rock also contains St Michael's Cave. This is one of the most spectacular natural grottos in Europe and is a major tourist attraction.
- 20.9 The prominence of the Upper Rock in relation to the surrounding landscape has meant that throughout Gibraltar's long history, the area has been used to construct defensive positions to protect Gibraltar from its enemies. Many of these installations are important tourist attractions such as the Siege Tunnels that began to be excavated during the Great Siege of 1779-83. They contain many gun emplacements that overlooked the Spanish positions on the isthmus. Other defensive batteries are scattered across the western slopes and the Charles V wall is a prominent feature in the area running from the top of the rock down to the Old Town on the western slope.

20.10 The Upper Rock provides an important recreational resource for local residents and is a popular area for walking. The winding road network provides for vehicular access to the area although there are only limited areas for car parking. Many parts of the slopes are criss-crossed by paths providing ideal routes for walking. Many of these paths provide spectacular views of the surrounding area and enable the general public to observe the flora and fauna.

The Upper Rock Nature Reserve

20.11 In order to ensure the preservation of this important area for future enjoyment by residents and visitors alike, a Nature Reserve was designated in 1993 covering the vast majority of this zone. The boundary generally follows the 'unclimable fence' and the 90m contour line.

20.12 The designation of the Nature Reserve has been extremely effective in protecting the area from inappropriate development. During the Plan period it will be important to keep the boundary of the Nature Reserve under review to ensure that the objectives of the designation of the Nature Reserve continue to be achieved.

POLICY Z9.1 – UPPER ROCK NATURE RESERVE BOUNDARY

THE BOUNDARY OF THE UPPER ROCK NATURE RESERVE SHALL BE KEPT UNDER REVIEW.

20.13 Visitor management strategies for the nature reserve will be kept under review to ensure that the fragile environment is not damaged by excessive numbers of visitors. The GONHS and others have recently prepared management strategies for the Upper Rock. The Government is considering these strategies with the aim of ensuring that the area is managed in a sustainable way for the benefit of Gibraltar as a whole.

20.14 There may be a need to accommodate some limited development within the Nature Reserve where this can be shown to be appropriate to the area. The planning objective will therefore be to limit such development to that which is essential, has no significant adverse effect on the preservation and enhancement of the character and appearance of the area, and is of limited size.

POLICY Z9.2 –NON-RESIDENTIAL DEVELOPMENT IN THE UPPER ROCK NATURE RESERVE

PLANNING PERMISSION FOR NEW (NON-RESIDENTIAL DEVELOPMENT) WITHIN THE UPPER ROCK NATURE RESERVE WILL ONLY BE GRANTED WHERE IT CAN BE DEMONSTRATED THAT:

A) IT IS AN APPROPRIATE USE COMPATIBLE WITH THE DESIGNATION OF THE AREA AS A NATURE RESERVE. APPROPRIATE USES INCLUDE:

- I) *RECREATIONAL USES THAT MAINTAIN THE OPEN CHARACTER OF THE NATURE RESERVE;*
- II) *EDUCATIONAL FACILITIES RELATED TO THE NATURAL ENVIRONMENT;*
- III) *TOURIST USES RELATED TO THE NATURAL OR HISTORICAL VALUE OF THE UPPER ROCK;*
- IV) *SMALL-SCALE HOTEL USE.*
- B) *IT IS COMPATIBLE WITH THE PRESERVATION AND ENHANCEMENT OF THE EXISTING CHARACTER OF THE AREA;*
- C) *THERE IS NO SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECT; AND*
- D) *ANY PERMANENT BUILDINGS ARE:*
 - I) *ESSENTIAL;*
 - II) *OF LIMITED SIZE;*
 - III) *IN KEEPING WITH THEIR SURROUNDINGS BY VIRTUE OF THEIR FORM, BULK, USE OF MATERIALS, COLOUR AND GENERAL DESIGN.*

20.15 Due to the ecological importance of the Nature Reserve and its visual prominence the planning policy is not to permit further residential development within the reserve. However, there are existing clusters of isolated residential development within the nature reserve and there needs to be a clear policy in relation to development proposals for these areas. The primary objectives of this policy are to ensure that there is no increase in the number of dwellings in the nature reserve and that there is no extension or consolidation of existing built up areas. Very small-scale development associated to an existing residential use will be permitted subject to there being no unacceptable impact.

POLICY Z9.3 – NEW DWELLINGS WITHIN THE NATURE RESERVE

PLANNING PERMISSION FOR NEW DWELLINGS WITHIN THE NATURE RESERVE WILL NOT NORMALLY BE GRANTED EXCEPT FOR THE REPLACEMENT OF EXISTING DWELLINGS SUBJECT TO THE FOLLOWING:

- A) *THE PROPOSED DWELLING IS OF A SIMILAR SIZE TO THE ORIGINAL, AND IN ANY EVENT MUST NOT HAVE A VOLUME GREATER THAN 20% MORE THAN THE VOLUME OF THE ORIGINAL DWELLING, NOR MUST BE ANY HIGHER THAN THE HIGHEST PART OF THE ORIGINAL DWELLING;*
- B) *APPLICATIONS FOR PERMISSION MUST INCLUDE DETAILED DRAWINGS CLEARLY SHOWING THE VOLUME AND HEIGHT OF THE ORIGINAL DWELLING;*

- C) *THE PROPOSAL MUST NOT HAVE A SIGNIFICANT DETRIMENTAL IMPACT ON THE CHARACTER OR APPEARANCE OF THE SURROUNDING AREA OR THE NATURE RESERVE IN GENERAL;*
- D) *THERE IS NO INCREASE IN THE NUMBER OF DWELLING UNITS;*
- E) *THE REPLACEMENT DWELLING IS ON THE SITE OF THE EXISTING DWELLING;*
- F) *THE EXISTING DWELLING IS SUBSTANTIALLY INTACT AND IS CAPABLE OF BEING INHABITED; AND*
- G) *THE PROPOSED DWELLING IS OF A DESIGN, COLOUR AND BUILT OF MATERIALS THAT ARE IN-KEEPING WITH THE CHARACTER AND APPEARANCE OF THE SURROUNDING AREA AND NATURE RESERVE GENERALLY.*

FOR THE PURPOSES OF THIS POLICY, "THE ORIGINAL DWELLING" MEANS THE DWELLING THAT STOOD ON THE SITE AT THE TIME THIS POLICY WAS ADOPTED AND DOES NOT INCLUDE ANY REPLACEMENT OR NEW DWELLING GRANTED PERMISSION UNDER THIS POLICY, NOR ANY EXTENSION OR ALTERATION GRANTED PERMISSION UNDER POLICY 9.4 OF THIS PLAN.

20.16 Development proposals for extensions, alterations and other development within the curtilage, and ancillary to the dwelling house, will be considered in a similar way.

POLICY Z9.4 – EXTENSIONS, ALTERATIONS OR IMPROVEMENTS TO DWELLINGS WITHIN THE NATURE RESERVE

PLANNING PERMISSION FOR THE EXTENSION, ALTERATION OR IMPROVEMENT OF AN EXISTING DWELLING HOUSE, OR FOR DEVELOPMENT WITHIN THE CURTILAGE OF AN EXISTING DWELLING HOUSE, WITHIN THE NATURE RESERVE, WILL ONLY BE GRANTED WHERE:

- A) *THE PROPOSAL DOES NOT EXCEED 20% OF THE VOLUME OF, NOR IS HIGHER THAN THE HIGHEST PART OF, THE ORIGINAL DWELLING ;*
- B) *THE PROPOSAL RESPECTS THE CHARACTER AND APPEARANCE OF THE ORIGINAL DWELLING AND THE SURROUNDING AREA BY VIRTUE OF ITS DESIGN, FORM, SCALE, LOCATION, COLOUR AND MATERIALS;*
- C) *THERE IS NO SIGNIFICANT DETRIMENTAL EFFECT ON NEIGHBOURING PROPERTIES BY OVERSHADOWING, OVERBEARING EFFECT OR LOSS OF PRIVACY; AND*
- D) *THE PROPOSAL WILL NOT RESULT IN AN OVER-INTENSIVE OR CRAMPED FORM OF DEVELOPMENT.*

FOR THE PURPOSES OF THIS POLICY, “THE ORIGINAL DWELLING” MEANS THE DWELLING THAT STOOD ON THE SITE AT THE TIME THIS POLICY WAS ADOPTED AND DOES NOT INCLUDE ANY EXTENSIONS OR ALTERATIONS GRANTED PERMISSION UNDER THIS POLICY, NOR ANY REPLACEMENT OR NEW DWELLINGS GRANTED PERMISSION UNDER POLICY Z9.3 OF THIS PLAN.

20.17 There may be a need for utility providers to undertake development within the nature reserve. The service providers will be expected to make every effort to avoid developing within the nature reserve. However, where it has been shown that there is no possible or feasible alternative then permission will normally be granted provided that the proposed development is sensitively designed and located so as to minimise the impact on the character, appearance and ecology of the nature reserve.

POLICY Z9.5 – UTILITY DEVELOPMENT WITHIN THE NATURE RESERVE

PROPOSALS FOR DEVELOPMENT RELATED TO THE PROVISION OF UTILITY SERVICES WITHIN THE NATURE RESERVE WILL NORMALLY BE GRANTED PROVIDED THAT:

- A) SATISFACTORY EVIDENCE IS SUBMITTED JUSTIFYING THE NEED TO LOCATE WITHIN THE NATURE RESERVE AND DETAILS OF THE ALTERNATIVE SITES INVESTIGATED AND THE REASONS FOR THEIR REJECTION; AND**
- B) THE PROPOSAL IS SITED AND DESIGNED SO AS TO MINIMISE ITS IMPACT ON THE CHARACTER, APPEARANCE AND ECOLOGY OF THE NATURE RESERVE.**

20.18 There are areas of the Upper Rock that are still within the control of the MOD. However, the recent agreement between the MOD and Government over land holdings has resulted in large areas of land in the Upper Rock being handed over to the Government. Nevertheless areas of the Upper Rock do remain in MOD ownership, such as at Rock Gun at the Northern end of the Rock. Whilst development by the MOD may currently be outside the control of the planning system, the MOD shall be encouraged to abide by the established policy in relation to development within the area.

20.19 The profile of the Rock of Gibraltar is very recognisable and is of great cultural value to its residents as well as being of landscape value. Consequently development that materially interrupts the ridgeline of the Upper Rock is considered to have a detrimental impact and will not normally be permitted.

POLICY Z9.6 – PROTECTION OF RIDGELINE

PROPOSALS FOR DEVELOPMENT THAT WILL MATERIALLY INTERRUPT THE RIDGELINE OF THE UPPER ROCK WILL NOT NORMALLY BE PERMITTED.

Buffer areas

20.20 There are areas of land within the zone but which lie outside the boundaries of the Nature reserve. These areas form an important part of the setting of the Upper Rock and generally act as a buffer between the nature reserve and the more built up areas such as the Old Town and the South district. These areas often act as important wildlife corridors, particularly in the area of the lower slopes in the vicinity of the Alameda Gardens.

20.21 The planning policy for these areas is normally to limit the amount of development in order to retain the existing land use pattern, preserve the setting of the Upper Rock and protect areas of ecological value. Limited development may be considered provided that there is no excessive adverse impact on the Reserve.

POLICY Z9.7 – DEVELOPMENT ADJACENT TO THE NATURE RESERVE

***WITHIN AREAS ADJACENT TO THE BOUNDARIES OF THE NATURE RESERVE
PLANNING PERMISSION FOR NEW DEVELOPMENT WILL ONLY BE GRANTED
WHERE:***

- A) THERE IS NO EXCESSIVE ADVERSE IMPACT ON THE RESERVE; AND***
- B) THE PROPOSAL IS FOR ESSENTIAL INFRASTRUCTURE WORKS; OR***
- C) THE PROPOSAL INVOLVES VERY LIMITED LOW DENSITY RESIDENTIAL
DEVELOPMENT; OR***
- D) THE PROPOSAL IS FOR TOURIST OR RECREATIONAL PURPOSES.***

***PROVIDED THAT THE PROPOSAL WILL NOT HAVE A SIGNIFICANT DETRIMENTAL
IMPACT BY VIRTUE OF ITS DESIGN, SITING, SCALE, FORM OR USE OF
MATERIALS, ON THE CHARACTER OR APPEARANCE OF THE SURROUNDING
AREA OR ON THE SETTING OF THE UPPER ROCK, NOR WILL IT HAVE ANY
SIGNIFICANT DETRIMENTAL IMPACT ON ANY SITE OF ECOLOGICAL VALUE.***

21 IMPLEMENTATION, MONITORING AND REVIEW

Implementation

- 21.0 The preparation of this Plan is only the first step in establishing a sound planning framework that can guide the future development of Gibraltar. The Plan provides the basis for rational and consistent decision making, and offers certainty to the general public and prospective developers of what will and what will not be permitted. It is therefore important that everybody involved in shaping the future of Gibraltar, whether they be public sector departments or agencies, private developers or voluntary organisations, are familiar with the contents of the Plan.
- 21.1 Implementation of the Plan's policies will largely be achieved through the Development and Planning Commission's determination of planning applications and the use of conditions attached to permissions. In addition, the Plan has identified policy areas for further consideration and site-specific proposals for implementation, which must be implemented if the objectives of the Plan are to be realised. Much of this work will be public sector driven and it is therefore essential that all public sector organisations that have a role to play in the implementation of the Plan ensure that they fully assess the deliverables expected of them and allocate their resources accordingly.
- 21.2 Table 1 summarises those aspects of the Plan that require specific action. The table identifies the relevant policy, action required and the organisation that will be mainly responsible for its implementation.

Monitoring

- 21.3 Monitoring of relevant indicators is important to be able to measure the success of the Plan. It is through constant monitoring that it is possible to identify where policies need to be strengthened, changed, or even removed from the Plan.
- 21.4 The Development and Planning Commission intends to develop a series of indicators to assess the performance of the Plan. The basis of monitoring is derived from data availability and it is therefore important to identify appropriate sources of relevant data.
- 21.5 The development control system itself will provide much data relevant to the monitoring of the Plan. The recent introduction of a new computerised applications database should make the collection and analysis of data relating to planning applications easier to achieve.
- 21.6 Data on other external factors such as population changes will need to be collected from sources outside the Town Planning section.

Review

- 21.7 This Plan has been formulated in the context of current circumstances. However, circumstances do vary over time and there are many factors that influence the use of land. For a Plan to remain relevant and to act as an effective tool in land use management it is important that periodic reviews are undertaken. In this way, changes in circumstances that

affect land use can be considered and incorporated into a new plan that will effectively guide future development. The monitoring system set up to monitor the success of this Plan will be a valuable source of information when reviewing the Plan.

Table 1 - IMPLEMENTATION

POLICY NO	ACTION REQUIRED	RESPONSIBILITY FOR EXECUTION
GDS4	Important Open Spaces – Identification	ENV
GDS10	Review of Building Regulations	BC/LSU
GDS12	Practical implementation of micro-renewable technologies	ENV/AQ/GEA
GDS20	Keep illumination schemes under review	T
ENV13	Designation of Tree Preservation Orders	TP
ENV17	Plan a programme of Environmental Improvement Schemes	TSD
ENV18	Designation of Conservation Areas to be kept under review	H/TP
ENV20	Designation of protected monuments, buildings and properties	H
H9	Review of off-street car parking within/adjacent residential estates	HSG/TSD
T1	Monitoring of visitor numbers	T/ENV
T4	Keep under review demand for new hotels	T
TR1	Promotion of alternative means of transport	ENV
TR4	Provision of public car parking to be kept under review	TSD
TR9	Provision of disabled parking spaces in new car parks	TSD/Private sector
TR11	Investigate potential to provide secure cycle parking facilities in existing public car parks and incorporate in new	TSD/ENV

TR12	Keep under review operation of coach park	T
S1	Keep under review land requirements for education, community and religious facilities	ED/MHYS
LR1	Increased public access to existing recreational facilities	MHYS/ED/ MOD
LR3	Enhancement of existing provision and need for recreational space	MHYS
LR4	Assessment of sports organisations premises	MHYS
LR5	Monitoring and review of youth facilities	MHYS
UW5	Identification of new construction waste site	TSD/EA/ENV
UW8	Investigate feasibility of underground storage areas	TSD/EA/ENV
Z3.4	Keep under review the operational requirements of the Port	MTEC/PD/PA
Z4.2	Environmental Improvement scheme for Eastern Beach to be prepared	TSD/T
Z5.4	Investigate the feasibility of land reclamation off western Beach	MEDTT
Z6.3	Prepare comprehensive road improvement scheme for Devil's Tower Road	TSD
Z6.6	Preparation of Environmental Management Plan for the Cemetery	ENV/GONHS
Z7.1	Prepare Environmental Improvement scheme for Europa Point	TSD/T
Z8.5	Prepare Environmental Improvement scheme for Little Bay	TSD/T
Z9.1	To keep under review the boundary of the Upper Rock Nature Reserve.	ENV/GONHS

NB: For the purposes of this summary table the Town Planning section has only been listed in the last column as being 'responsible for execution' where it would be taking a leading role. The Town Planning section would expect however to be involved in all the above to varying degrees and the responsible body should therefore ensure that appropriate consultation procedures are put in place so that the Town Planning section is fully involved in the implementation of the policies and proposals of this Plan.

Abbreviations:

AQ	AquaGib Ltd
BC	Building Control
EA	Environmental Agency
ED	Department of Education
ENV	Department of the Environment
G EA	Gibraltar Electricity Authority
GONHS	Gibraltar Ornithological and Natural History Society
H	Heritage Division
HSG	Housing Department
LSU	Legislation Support Unit
MEDTT	Ministry for Enterprise, Development, Technology and Transport
MHYSC	Ministry of Heritage, Youth, Sport and Culture
MOD	Ministry of Defence
PA	Port Authority
PD	Port Department
T	Tourism
TSD	Technical Services Department

PROPOSALS MAPS

Key to Maps

Development Zone Boundaries

Zone 1 – Old Town – Proposals for this zone are detailed in 'The Old Town Plan'.

Zone 2 – Bayside/Westside

Zone 3 – Port and Harbour

Zone 4 - Eastside

Zone 5 – North Front

Zone 6 – North District

Zone 7 - Europa



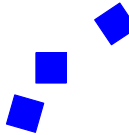





























Zone 8 – South District

Zone 9 – Upper Rock

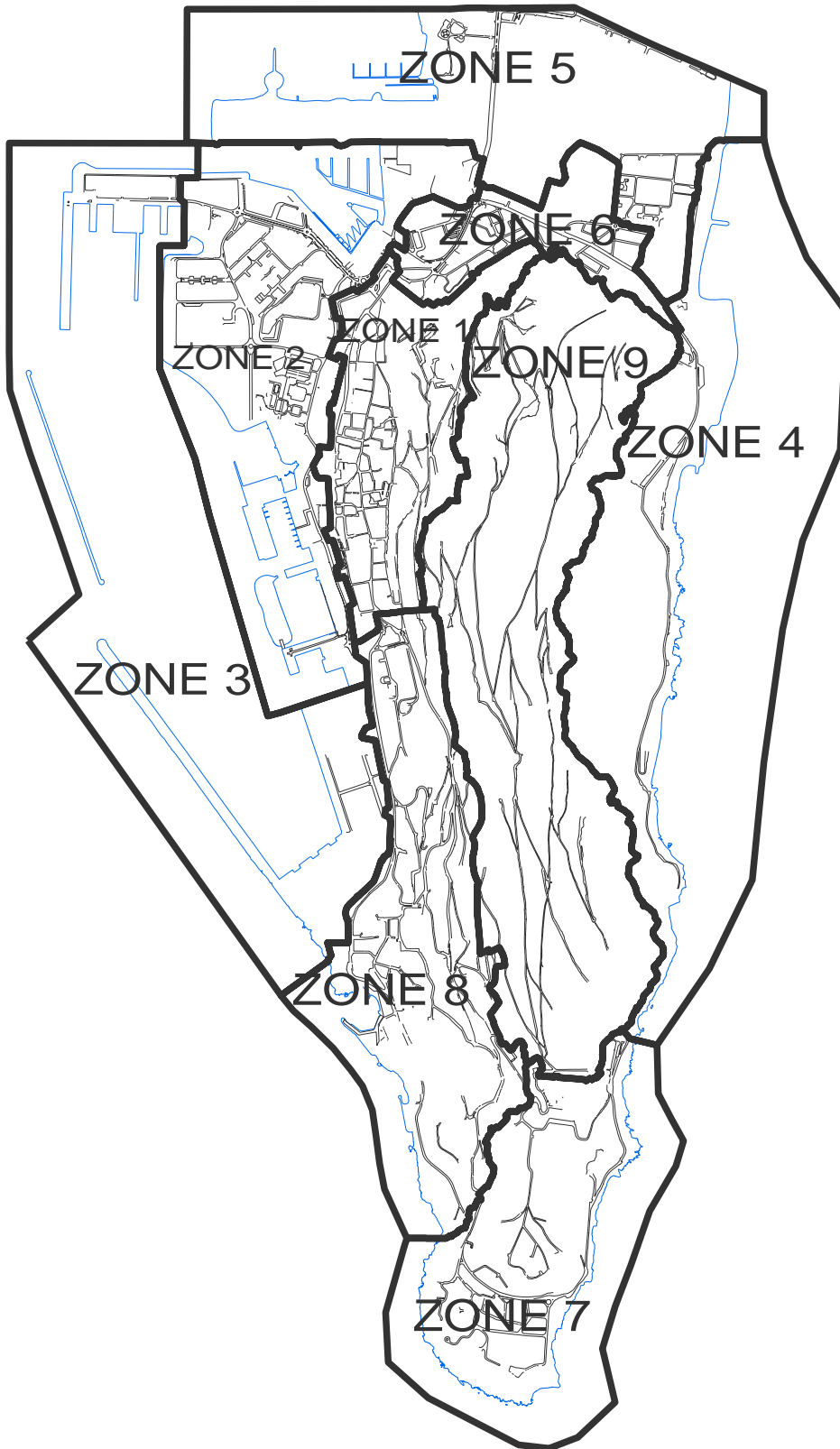
Overall Plan of Sites of Community Importance



KEY

Policies and Proposals

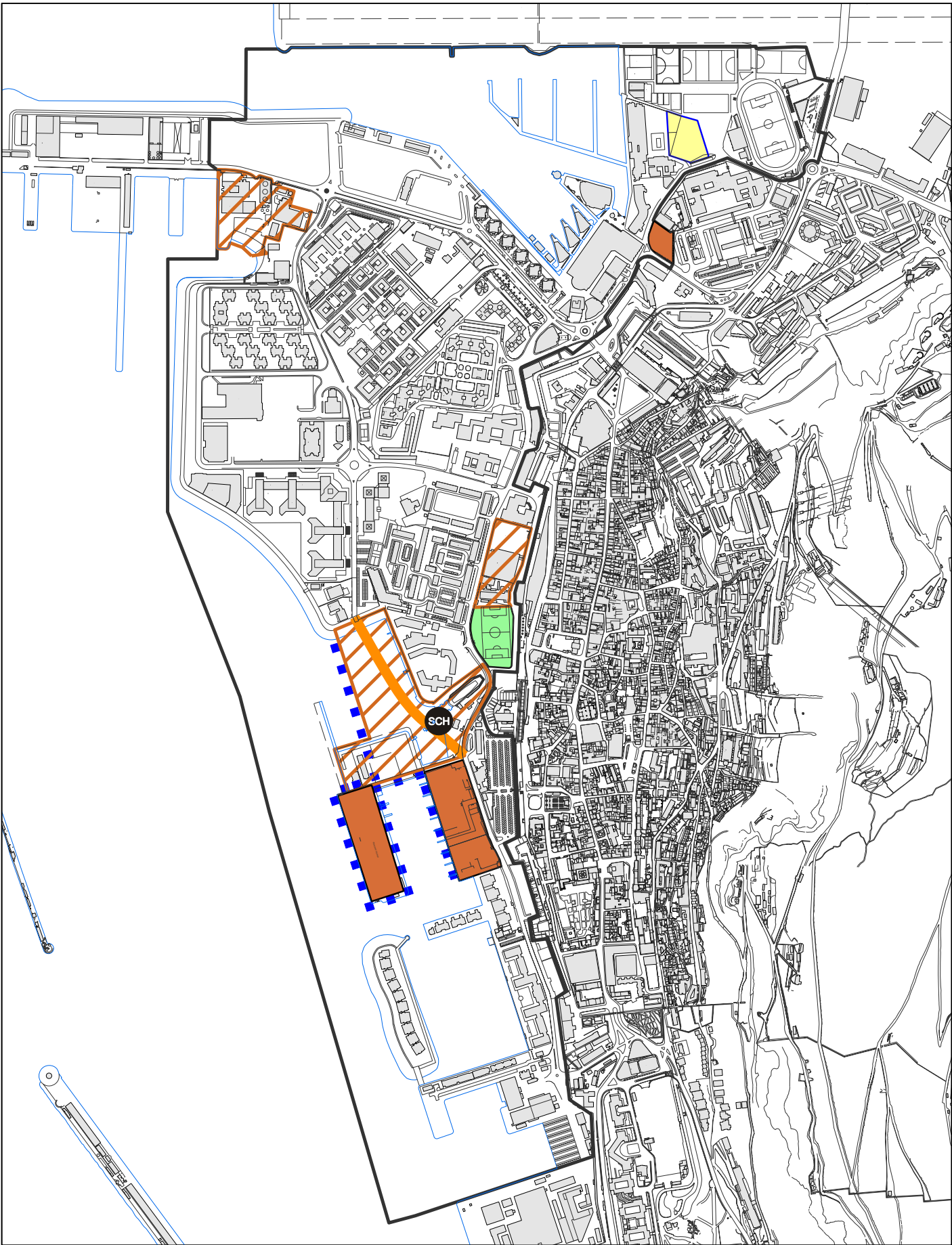
-  Residential
-  Nature Reserve
-  Waterfront Promenade
-  Mixed Residential/ other uses
-  SCI-Terrestrial
-  Upper Rock Access
-  Industrial
-  SCI - Marine
-  Waste Water Treatment Plant
-  Mixed commercial/ car park
-  Port Area
-  Waste
-  Recreation/ Leisure
-  Airport Extension
-  Safeguarded land
-  Tourist/Recreation
-  Great Sand Slopes
-  School
-  Primary Shopping
-  Park
-  Cruise Terminal Extension
-  Secondary Shopping
-  HMP
-  Car Park
-  Other use
-  Road Schemes
-  Environmental Improvement
-  Ship Repair
-  City Wall Trail
-  Key Site
-  Study Area
-  Upper Town Tourist Route
-  Restoration

Gibraltar Neanderthals

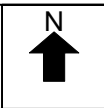


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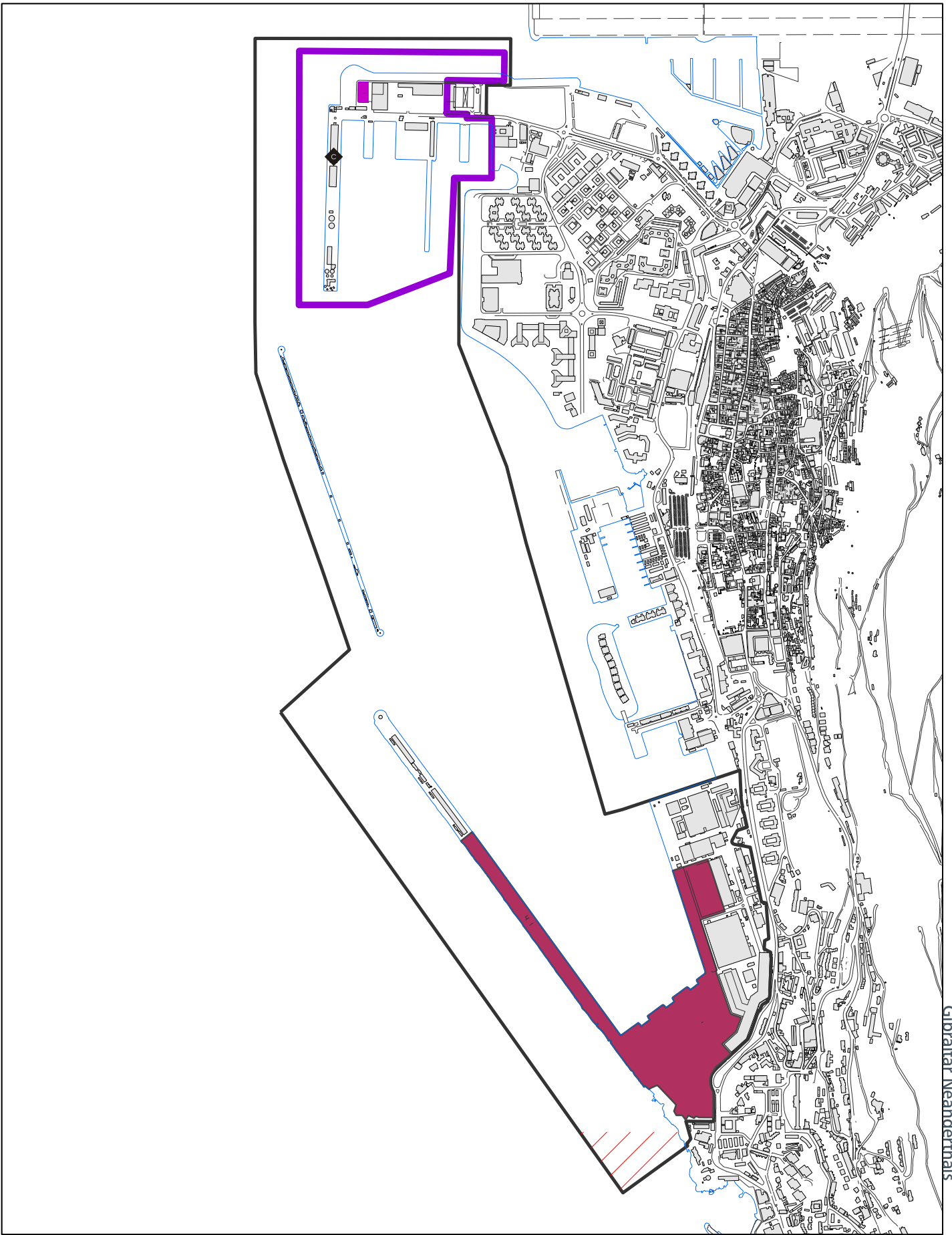
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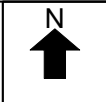
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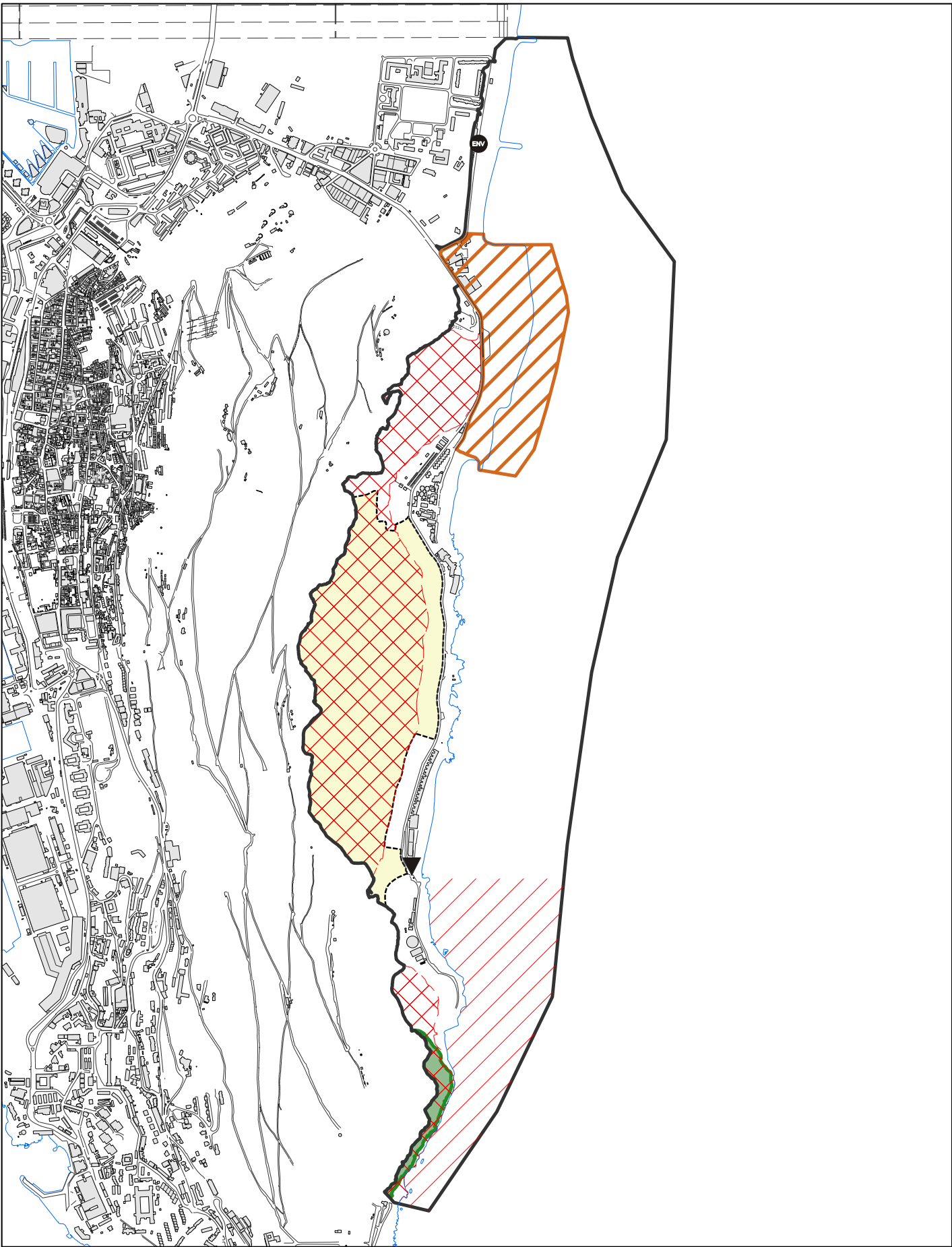


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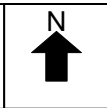
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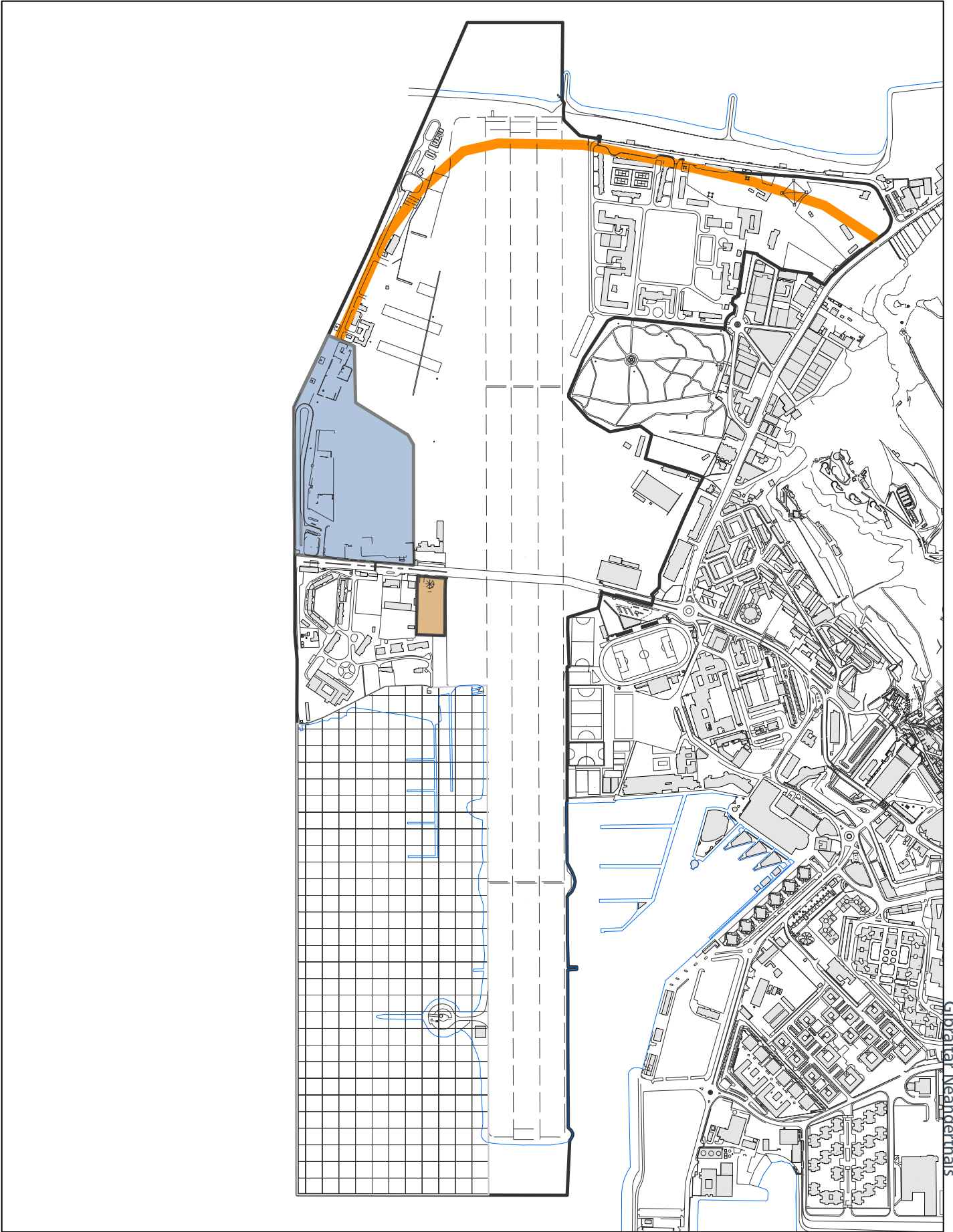
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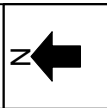
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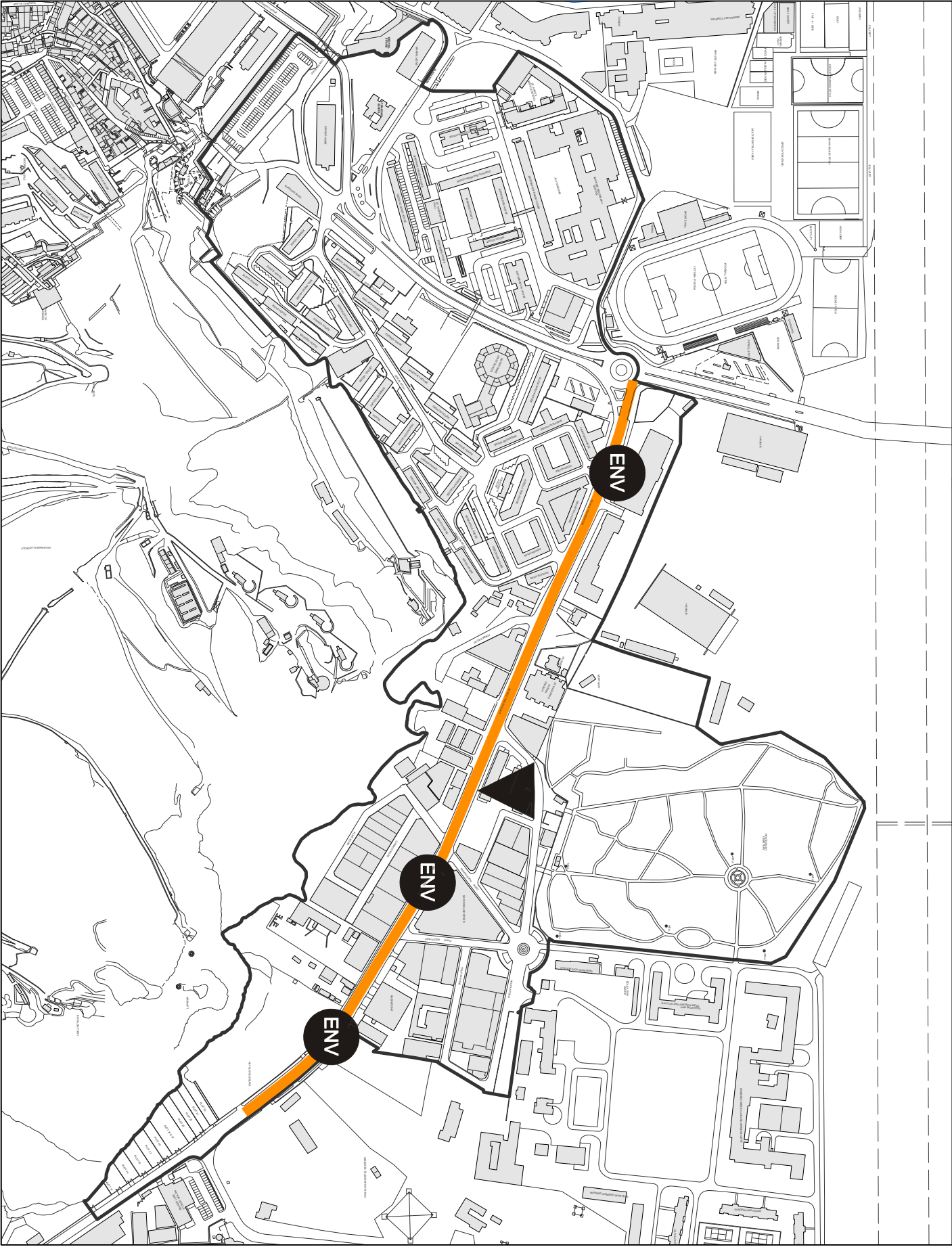



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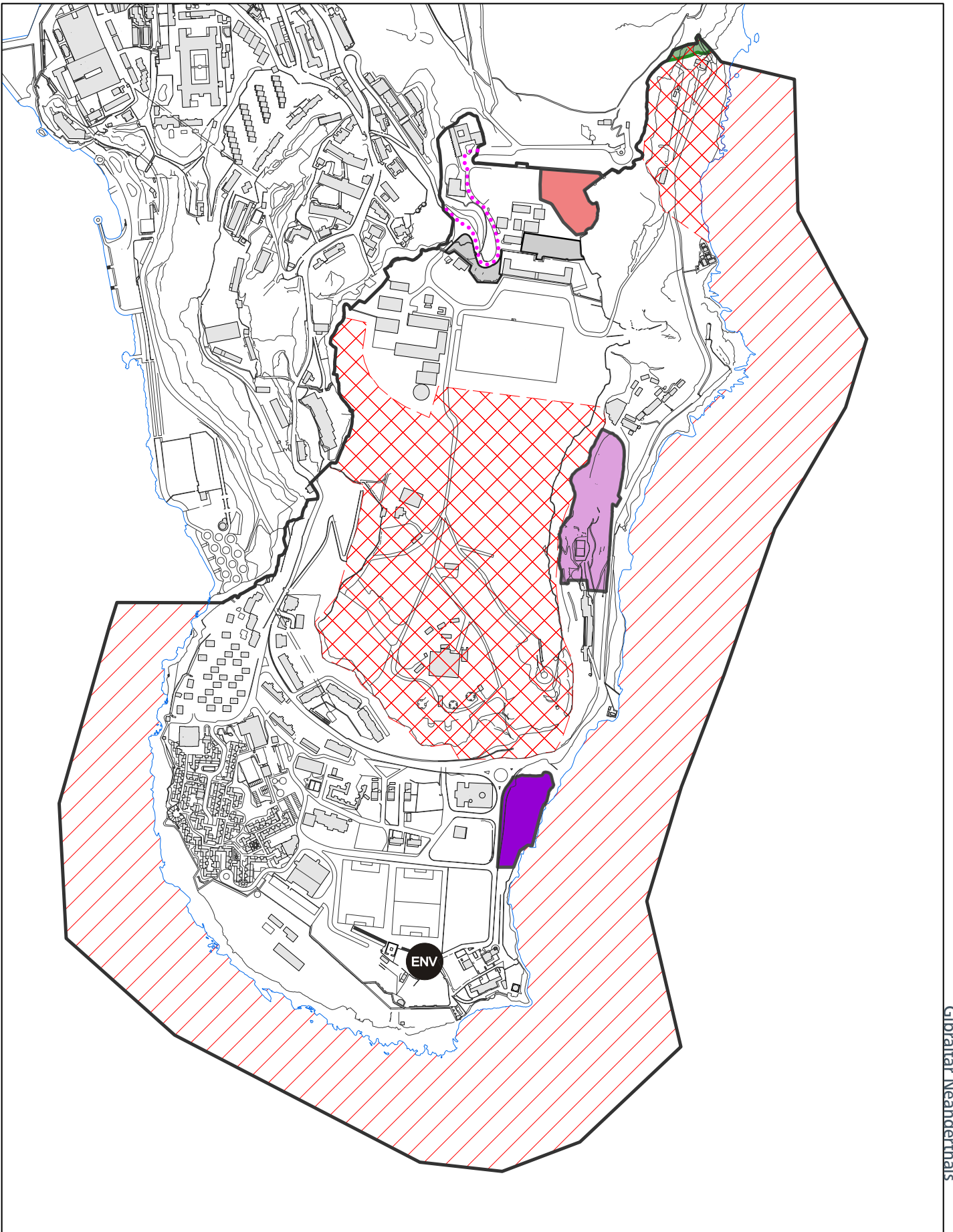
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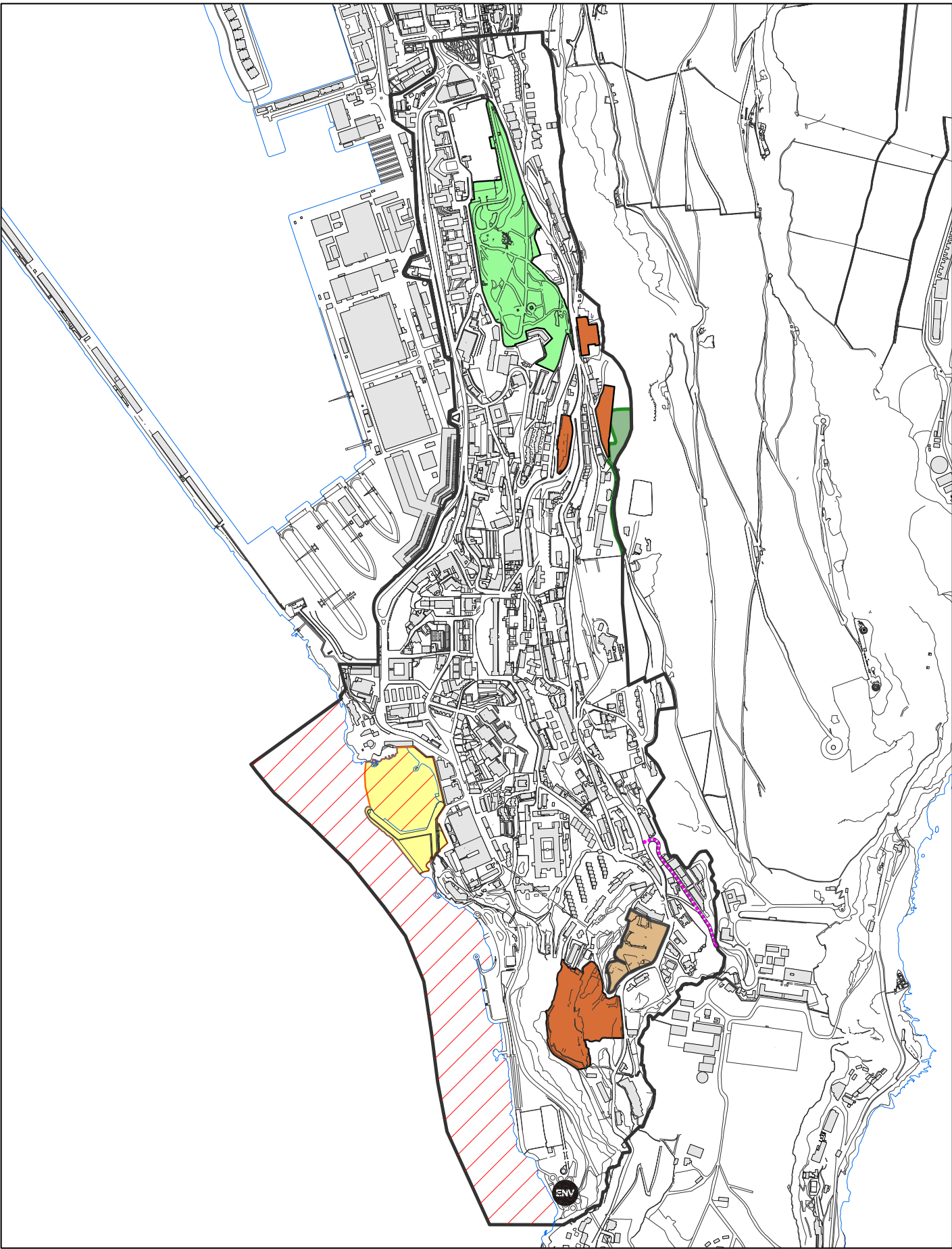


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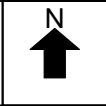


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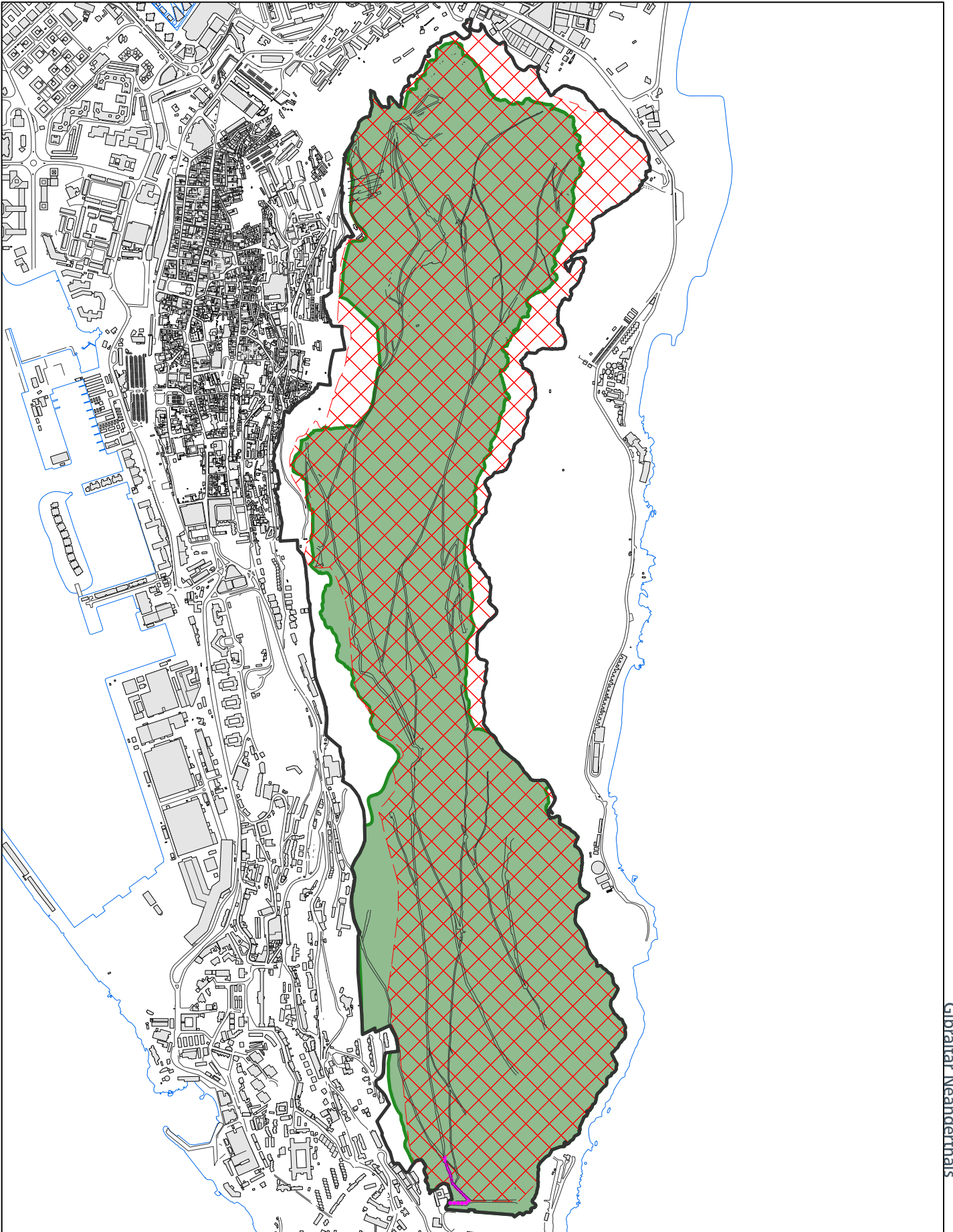
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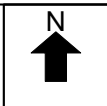
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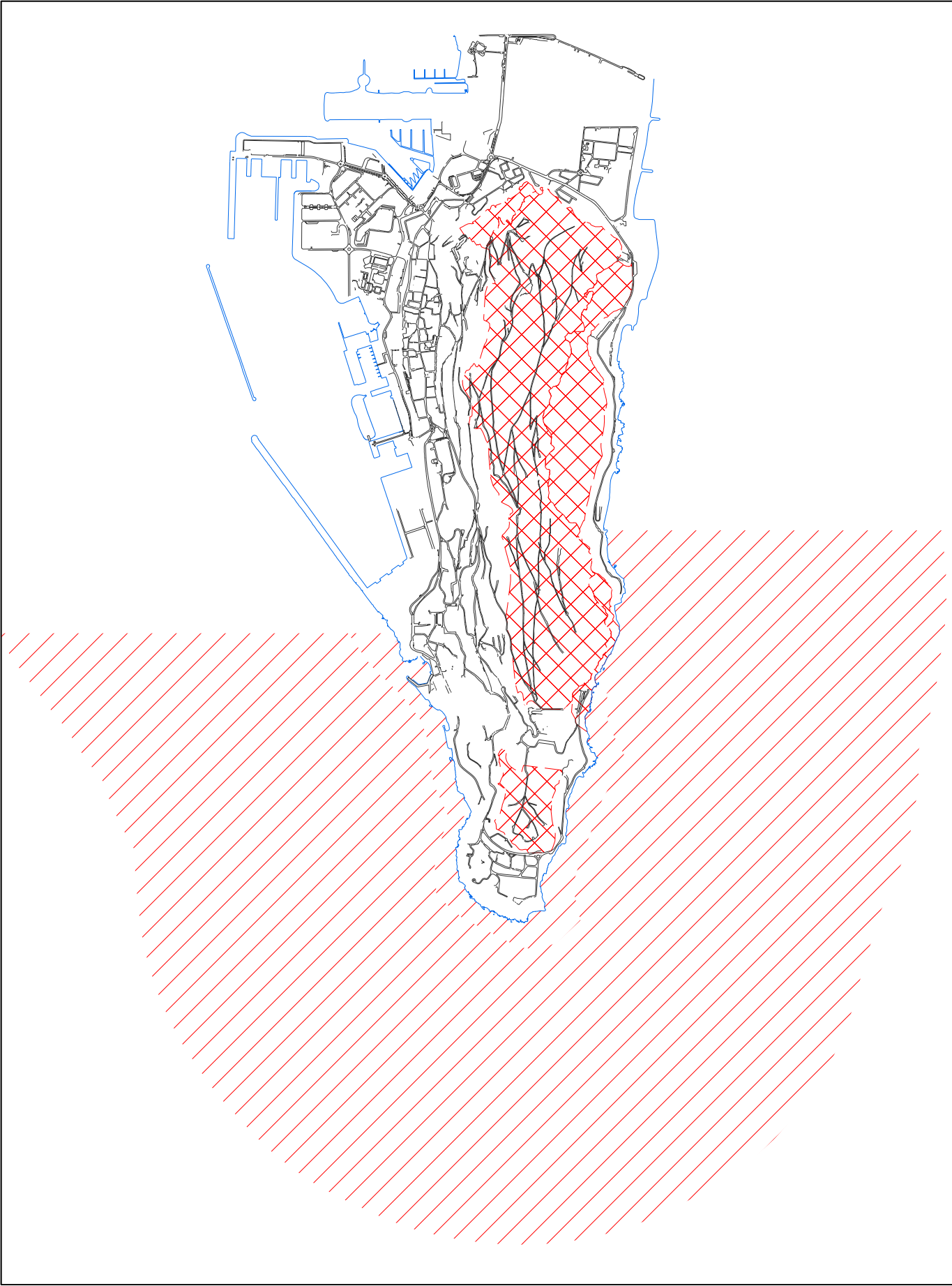



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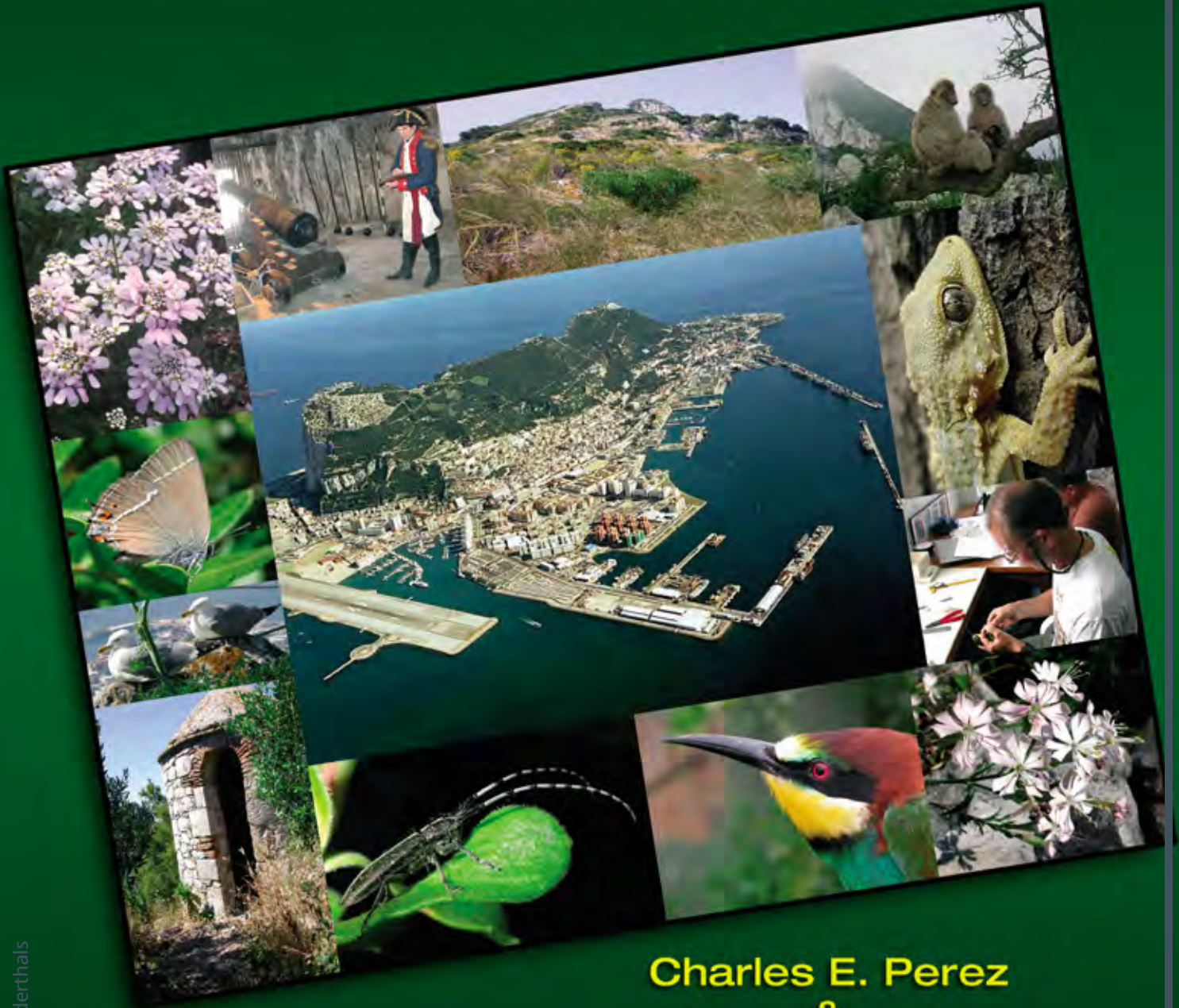


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GONHS Upper Rock Nature Reserve - A Management Action Plan 2005

Upper Rock Nature Reserve

A Management and Action Plan



**Charles E. Perez
&
Keith J. Bensusan**

**Gibraltar Ornithological
and Natural History Society**





Upper Rock Nature Reserve: A Management and Action Plan

Charles E. Perez
&
Keith J. Bensusan

Gibraltar Ornithological and
Natural History Society

Produced for the
Government of Gibraltar

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Jews' Gate, Upper Rock Nature Reserve, P.O. Box 843, Gibraltar

Citation: Perez, C.E. & Bensusan, K. (2005) The Upper Rock Nature Reserve,
A Management and Action Plan. The Gibraltar Ornithological & Natural History Society.
Gibraltar.

Published by the Gibraltar Ornithological & Natural History Society.
Feasibility study and publication funded by the Government of Gibraltar generously assisted by
the European Union under the European Regional Development Fund Objective 2 Programme.

Contents

Foreword	VI
Acknowledgements	VI
1) Introduction	1
1.1. The Upper Rock Nature Reserve	3
1.2. Research	5
2) GONHS & The Nature Reserve	7
2.1. Introduction	9
2.2. History	9
2.3. Current Work	9
2.4. The Future	10
3) Legislation	11
3.1. Administration	14
3.2. Recommendations	14
3.3. Traffic	15
3.4. Recommendations	17
3.5. Vandalism, Defacement and Litter	18
3.6. Recommendations	18
3.7. Buildings and Structures	19
3.8. Recommendations	19
3.9. Wildlife Wardens	20
3.10. Recommendations	20
3.11. Disturbance to Fauna	21
3.12. Recommendations	22
3.13. Introduced Fauna and Flora	22
3.14. Recommendations	25
3.15. Poisons	25
3.16. Recommendations	26
3.17. 'The Authority'	27
3.18. The Role of the Royal Gibraltar Police	27
3.19. Recommendations	28
4) European Wildlife Directives & the Convention on Biodiversity	29
4.1. Natura 2000	31
4.2. The Habitats Directive	31
4.3. The Gibraltar Habitats Directive Report	32
4.4. Additional notes & comments	34
4.5. The Natura 2000 network	36
4.6. Eurobat	40
4.7. The Biodiversity Convention	41
5) The Face of the Upper Rock	47
5.1. Litter	49
5.2. Graffiti	50
5.3. Roads	51
5.4. Sewerage and Disused Pipes	52
5.5. Paths	53
5.6. Structures	55
5.7. Picnic Sites	57
5.8. Recommendations	58
6) Geology & Caves	61
6.1. Geological Features	63
6.2. Caves	64
6.3. Threats to Cliffs	71
6.4. Threats to Caves	73
6.5. GONHS	73
6.6. Recommendations	74
7) Heritage	75
7.1. Caves	77
7.2. Moors	77
7.3. Spaniards	78
7.4. British	78
7.5. World War II	79
7.6. Water Catchments	80
7.7. Recommendations	80
8) Introduced Flora	85
8.1. <i>Senecio angulatus</i>	89
8.2. <i>Chasmanthe floribunda</i>	91
8.3. <i>Lantana camara</i>	93
8.4. <i>Opuntia ficus-indica</i>	94
8.5. <i>Carpobrotus acinaciformis</i>	95
8.6. <i>Oxalis pes-caprae</i>	97
8.7. <i>Ailanthus altissima</i>	99
8.8. <i>Tecoma capensis</i>	100
8.9. <i>Aloe arborescens</i>	101
8.10. <i>Agave americana</i>	102
8.11. Problem Areas	104
8.12. Proposed list of Exotic Plant Species that should not be grown within the Upper Rock Nature Reserve	106

9) Pine Trees	.....	107
9.1. Introduction	.....	109
9.2. Methods	.....	111
9.3. Results	.....	112
9.4. Discussion	.....	116
10) Habitats	.....	119
10.1. Introduction	.....	121
10.2. Methods	.....	122
10.3. Results	.....	124
10.4. Discussion	.....	129
10.5. Recommendations	.....	133
11) Fire and Firebreaks	.....	135
11.1. Location of Firebreaks	.....	137
11.2. Flora and Fauna of the Firebreaks	.....	138
11.3. Fire and Firebreaks	.....	139
11.4. The Gibraltar City Fire Brigade and the Upper Rock Nature Reserve	.....	139
11.5. Management of the Firebreaks	.....	140
11.6. Clearing of the Firebreaks	.....	140
11.7. Recommendations	.....	141
12) Birds	.....	143
12.1. Directives and Conventions	.....	145
12.2. How are these applied in the Upper Rock Nature Reserve?	.....	146
12.3. International Importance of Gibraltar for Birds	.....	146
12.4. Migrants	.....	146
12.5. Breeding Birds	.....	151
12.6. Recommendations	.....	153
13) Mammals	.....	155
13.1. Mammal Reintroductions	.....	159
13.2. Recommendations	.....	160
14) Barbary Macaques	.....	163
14.1. Documentation & Research	.....	165
14.2. Feeding	.....	166
14.3. Illegal Feeding	.....	168
14.4. Population Control	.....	169
14.5. Routine Management	.....	171
14.6. Other Recommendations	.....	173
15) The Yellow-legged Gull	.....	175
15.1. History	.....	177
15.2. Control	.....	177
15.3. Discussion	.....	179
15.4. Recommendations	.....	179
16) The Lower Slopes	.....	181
16.1. Orchids	.....	183
16.2. Fauna of the Lower Slopes	.....	185
16.3. Habitat Succession on the Lower Slopes	.....	185
16.4. Other Threats	.....	186
16.5. Recommendations	.....	186
17) Research on the Upper Rock	.....	187
17.1. Research	.....	189
17.2. Biological Reserve	.....	189
17.3. Monitoring	.....	190
17.4. Field Courses	.....	190
17.5. Bird Ringing	.....	192
17.6. Macaques	.....	193
17.7. Archaeology	.....	194
17.8. Others	.....	194
17.9. The Future...	.....	194
17.10. Recommendations	.....	195
18) MOD sites	.....	197
18.1. Rock Gun and Middle Hill	.....	200
18.2. Aerial Farm and Firebreaks	.....	202
18.3. Spyglass	.....	202
18.4. Ince's Farm Residential Area	.....	202
19) Parque Natural Breña y Marismas del Barbate: a Case Study	.....	203
19.1. The Breña Reserve	.....	206
19.2. Flora and Fauna	.....	207
19.3. General Management	.....	207
19.4. Environmental Management	.....	208
19.5. Economic Interests	.....	209
19.6. Visitor Provisions	.....	209

19.7. Urbanisation Pressures	.210
19.8. Comparisons	.210
20) Tourist Sites	.213
20.1. Access	.215
20.2. Jews Gate	.215
20.3. St. Michael's Cave	.218
20.4. Ape's Den	.219
20.5. Upper Galleries	.220
20.6. Princess Caroline's Battery	.222
20.7. City Under Siege	.222
20.8. The Moorish Castle	.223
20.9. Cable Car Top Station	.223
20.10. Recommendations	.224
21) Transport, Traffic & Tourism	.227
21.1. Roads	.229
21.2. Access	.232
21.3. Recommendations	.233
21.4. Tourism	.233
21.5. Revenue	.237
21.6. Recommendations	.238
21.7. Vehicles Survey	.239
21.8. The Proposed Funicular Project	.247
21.9. Recommendations	.249
22) Opportunities	.251
22.1. Overseas Territories Environment Programme	.253
22.2. The EUROPARC Federation	.255
22.3. The Charter	.257
22.4. Recommendations	.258
23) Management Plan	.261
23.1. Structure	.263
23.2. Proposed Plan Implementation	.263
23.3. Proposal 1	.264
23.4. Proposal 2	.264
23.5. Division of Responsibility	.265
23.6. Implementation Methods	.265
23.7. Principles	.266
23.8. Goals and Objectives	.247
24) Action Plan	.273
1. Legislation	.275
2. The Face of the Upper Rock Nature Reserve	.276
3. Transport, Traffic & Tourism	.277
4. Introduced Flora	.277
5. Fire & Firebreaks	.278
6. Heritage	.278
7. Mammals	.278
8. Birds	.279
9. Habitats	.279
10. Research and Monitoring	.279
11. Tourist Sites	.279
12. Pine Trees	.281
13. Geology & Caves	.281
14. Lower Slopes	.281
15. European Wildlife Directives	.281
16. Barbary Macaques	.282
17. Works Programme for 9.1	.282
Appendix 1: Species Lists	.285
2.1. Vascular Plants	.285
2.2. Birds	.288
2.3. Mammals	.289
2.4. Reptiles & Amphibians	.289
2.5. Beetles (Coleoptera)	.290
2.6. Butterflies & Moths (Lepidoptera)	.290
2.7. Dragonflies & Damselflies (Odonata)	.292
2.8. Isopods	.292
2.9. Molluscs	.292
Appendix 2: Vandalism Litter & Defacement Photographs	.295

Foreword

The Upper Rock has seen many changes, even in recent decades. As a schoolboy, a young birdwatcher and a Scout I used to wander through lonely roads and paths across areas of low vegetation, not ever chancing on a stray cat, and certainly never experiencing a traffic jam, and I used to assume, as one does at that age, that things would never change. The Upper Rock was busy in those days of a closed frontier, when many Gibraltarians would visit "el monte" for a stroll or a picnic at weekends. But other than that, it was for the wildlife – and for a dedicated few.

Times moved on, and with an open frontier and increasing tourism, with growing vegetation and the encouraging of exotic species of animals and plants, as well as an ever-increasing amount of litter, the Upper Rock is no longer the quiet place it once was.

As urban areas in Gibraltar become more densely populated, as bits of open ground get converted into buildings, as even its quiet heights of wilderness are threatened by Mickey Mouse ideas, the importance of the Upper Rock to Gibraltar has increased. As we acquire more and more knowledge about its natural inhabitants our concern for their survival also increases, and our realisation that we can do something about it becomes all the stronger. And so does our responsibility as a mature Community to protect the natural riches in our custody.

Tourists abound on the Upper Rock, and often complain about it. Locally, individuals and organisations periodically raise the issue, but then all goes quiet. In 2002, following another spate of negative comments in the press, GONHS considered the possibility of initiating a campaign to improve the Upper Rock, based on its already extensive knowledge of the area. But the opportunity afforded by the possibility of European Union Funds for a study of the feasibility of managing the area for all its users, but consistent with the protection and enhancement of nature, was not one to be missed. With the support of the then Minister for the Environment, the Hon E M Britto, and after reassuring all parties that our work would be a scientific, factual one with the aim of asking the right questions and providing fair answers, we embarked on this project.

We were lucky to be able to count on the services of two dedicated and extremely knowledgeable people, longstanding members of GONHS, Charles Perez and Keith Bensusan, whose work primarily this is. Their enthusiasm, energy and thoroughly likeable personalities have all contributed in equal measure with their sound scientific discipline to producing a fine piece of work.

A management plan, an action plan, and an assessment of the feasibility of these, provide more than just a nice report. They provide an essential tool for facilitating improvement, and this document already fulfils much of what would be required of Gibraltar as a World Heritage Site, a Natura 2000 site, or even as part of the Strait of Gibraltar Biosphere Reserve of the future.

We acknowledge the confidence shown in us by the Government of Gibraltar in supporting the production of this report, despite the problems that implementing some of the recommendations may present. We acknowledge also that progress may be slow. But knowing in detail what the problems are is always the first step to resolving them. It is clear, and important to understand, that as a result of this document, we now know a great deal more about what makes up the Upper Rock and about what can be done to improve it.

We present it to the Government of Gibraltar with a commitment to co-operate in whatever way we can in implementing the recommendations which it is their prerogative to accept. But the proper management of the Upper Rock as a resource for Gibraltar and a reserve for nature depends on all its users having a long term vision and being willing to work towards it.

GONHS will continue to work with all interested parties in providing a nature reserve that is an asset useful to all, but abused by none.

John E. Cortes
MBE, JP, D. Phil, C.Biol, M.I.Biol, MIEEM, FLS
General Secretary
The Gibraltar Ornithological & Natural History Society
January 2005

Acknowledgements

The authors would like to thank all the persons that assisted us with information and provided interviews. These were:

- Major Derek Bathgate, Land Operations; Ministry Of Defence
- Mr Joe Desoiza, Chairman; Gibraltar Heritage Trust
- P.C. Andrew Fortuna, Wildlife Liaison Officer; Royal Gibraltar Police
- Mr Tony Almeida, Divisional Officer; Gibraltar City Fire Brigade
- Dr William Kunin; Senior Lecturer in Ecology at the University of Leeds
- Mr Peter Canessa, Chief Executive; Gibraltar Tourist Board
- Mr Paul Origo, Town Planner; Dept. of Trade, Industry & Communications
- Mr Aurelio Falero, Director; Land Property Services
- Mr John Gaggero and Mr George Gaggero; Directors, M.H. Bland Ltd.
- Mr Brian Bagu, Highways Engineer; Support Services Department
- Mr Carl Viagas, Conservation Officer; Heritage and Planning Division
- Mr J. Delgado, Chief Environmental Officer, and Mr Francis Martin, Senior Environmental Officer; Environmental Agency Ltd
- Prof. Clive Finlayson, Director and Dr Darren Fa; The Gibraltar Museum
- Ms Janet Howitt and Mr Moses Benrimoj; Environmental Safety Group
- Mr Clive Zammit, President, Mr Thomas Vella, Secretary and Mr Alfred Roman, Treasurer; Gibraltar Taxi Association

Thanks are also due to Mr Leslie Linares for the invaluable contribution of his knowledge of the botany of the Upper Rock and for kindly providing a number of his photographs, to Mr Jason Easter for providing a provisional list of Isopods, to Mr Alex Menez for providing a list of Molluscs, and to Mr Eric Shaw, Mr Damien Holmes and Mr Dale Lagaea for facilitating access to Barbary macaque data.

The authors would like to thank the extensive contribution made by Dr J.E. Cortes from GONHS in Chapter 4 on 'European Directives', particularly in the preparation of habitat types. Dr Cortes has been instrumental in the preparation and research of Gibraltar's administrative obligations with regard to our natural environment, in the Natura 2000 and Habitats Directive for submission to the European Union.

In addition, special thanks are due to Mr Paul Rocca, Mr Roger Rutherford, Mr Michael Wahnnon and Mr Julien Martinez who, by helping us cover parts of our vehicles survey, endured many long hours of counting. We are also grateful to Ms Lorna Swift of the Garrison Library for her tireless help retrieving all the material we required.

Special thanks goes to Wildlife Gibraltar who furnished us with an office and equipment within the Alameda Gardens from which we worked.

Finally the authors would like to express their gratitude to Dr John Cortes, Mr Eric Shaw and Mr Brian Gomila for their useful comments on the manuscript.

Distribution maps were produced using 'DMAP for Windows' version 7.1f by Alan Morton.

The work involved in the production of this report was funded under the European Union Structural Funds Objective 2 Programme by the European Union and the Government of Gibraltar. Special thanks are due to Mr Francis Sheriff of the Ministry for Trade, Industry and Communications for his help and advice in accessing these funds.



1. Introduction

1. Introduction

1.1 The Upper Rock Nature Reserve

The Upper Rock has undergone several transformations in its habitats and uses. Habitats have ranged from a once (presumably) forested landscape to a totally denuded slope during the Great Siege, to a succession of vegetation back to dense maquis with scattered patches of garrigue and pseudosteppe in recent times. In earlier days, goats and some cattle grazed the slopes, trees were felled for fuel, and the military installed batteries on the higher reaches of the northern part of the Rock for the protection of the fortress. The Upper Rock continued to play a mainly military role until well into the 20th Century. More recently, the emphasis has changed to that of a Nature Reserve and, most noticeably, a tourist attraction.

During the early part of the 20th century the Upper Rock was reinforced and more gun batteries and military installations were constructed, especially on the advent of WWII. The area became a total exclusion zone to the resident population, and an 'unclimbable fence' was erected. Soon after the war the area was again opened to the public, but only during daylight hours. The area was controlled by the 'Security Police', (now the Gibraltar Services Police), and firebreak and vegetation maintenance on the lower slopes and Upper Rock was carried out by the MOD.

In the mid to late 1900's most of the Upper Rock was ceded to the Gibraltar Government, with the MOD retaining control of Middle Hill, Rock Gun, Spyglass and, significantly, the Barbary macaques. St. Michael's cave and the Upper Galleries were the first two sites to be developed for tourism, but the macaques quickly became (and still remain) the most important attraction enticing tourists to Gibraltar. The macaques continued under the responsibility of the military under the Gibraltar Regiment until 1990, when 'MEDAMBIOS', a company run by macaque expert Dr John Fa, took over for the following two years under contract to the Gibraltar Tourism Agency Ltd.

In the meantime, the Gibraltar Ornithological and Natural History Society (GONHS) was striving for a more conservation-oriented policy for the natural habitats in Gibraltar. Some keen conservationists (many of whom were founder members of GONHS) published 'Environmental Conservation in Gibraltar' and the first basis of a management plan for Gibraltar's natural environment was drawn up as early as 1978 by Dr John Cortes in his document 'Conservation – A Future? Semi-natural nature reserve GIBRALTAR: A management Plan' (Cortes 1978). These were the first steps towards an awareness campaign aimed at the authorities. Cortes (1978) analysed the problems and provided solutions, noting that the Town and City Plan of 1976 recognised the need for conservation. Very little heed was paid to this. These documents are unfortunately probably gathering dust in the Government's archives.

Eventually, the Government of Gibraltar Recognised that it had to take steps in conserving the Rock's Natural Heritage. The GONHS was instrumental in drafting the 'Nature Protection Ordinance, 1991' (L/N11 1991), which affords protection to numerous species and provides for the protection of habitats. This ordinance was based on the United Kingdom's legislation on wildlife, and was amended and improved to suit Gibraltar's needs and peculiarities.

In 1992 'Sights Management Ltd.' was given a management contract that included the tourist sites and the Barbary macaques, and overall responsibility for the Upper Rock. The 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993) was drafted in 1993 when the Upper Rock was designated a Nature Reserve, and was published as a regulation as provided by the 'Nature Protection Ordinance, 1991'. A map of the area designated as a Nature Reserve by the Designation Order can be seen in Fig. 1. As a result entrance fees to the Upper Rock were now collected, which included entry to all sites. A concerted effort, presumably using gate monies, was made to improve sites, and roadsides were cleaned and firebreaks cleared on a regular basis. This arrangement continued until 1997 when the Gibraltar Tourist Board ended the contract and took over responsibility for the management of the Upper Rock Nature Reserve. The feeding and watering for the Barbary macaques was contracted to GONHS in 1999.



Figure 1. Outline map of Gibraltar with the boundary of the Upper Rock Nature Reserve in blue.

During this period, the Gibraltar Tourist Board invested very little time and money towards improving the condition and appearance to many of their sites, except for a lighting facility for the cave costing close to £750,000. The natural environment was totally disregarded, despite regular increases in the entrance fees with the audacious inclusion of an environmental levy, from which the environment never benefited. Adverse publicity in the press prompted the authorities to contract Master Services to clean the Upper Rock, but contractual constraints have limited this to a face-saving exercise, clearing only roadsides that are visible to visitors, and only recently cliff areas.

Uncontrolled entry into the Reserve at night, vandalism, graffiti and refuse depositions are just a few of the immense problems facing the existence of the Upper Rock as a Nature Reserve. Added to this is a lack of regular maintenance of sites, footpaths, firebreaks and roadways, which together with insufficient sanitation facilities compound the problem. At least some of these problems, those relating to nature conservation, would have been solved if many of the European Directives on nature protection and the environment had been implemented, and especially if the Nature Protection Ordinance were enforced rigidly.

These concerns prompted one of the authors, Charles Perez, to write a report entitled 'The Upper Rock Nature Reserve. An Environmental Impact Assessment Report 2002' (Perez 2002), dated 15th March 2002, on the state of the Upper Rock Nature Reserve. Copies were submitted to the Chief Minister and to the Ministers for the Environment and Tourism. The report was acknowledged, but very little action was taken on the many issues that had been put forward. As the deterioration of the Nature Reserve continued during the summer months of that year, numerous letters of complaint appeared in the press and several articles appeared in the Gibraltar Chronicle, highlighting the problems. These came from, amongst others, opposition parties who had been approached by concerned citizens and significantly from the Taxi Association, who carried out a cleaning campaign spurred on by the negative response they got from their clients, the tourists themselves.

The GONHS took a passive stand and observed how the situation evolved, taking note of the developments. The GONHS could have backed and substantiated the numerous, often totally justified criticisms and accusations, and even expanded on these. However, it decided to adopt this stance with a view to looking at constructive ways to approach the situation. The consensus was to produce a feasibility study and management plan, not only on environmental matters but also on all factors affecting the well being of the Upper Rock Nature Reserve, as all of these have a direct bearing on the sustainable development of the Upper Rock as a Nature Reserve. Success in obtaining European funding was crucial in instigating this report, and research on the same commenced at the beginning of 2003.

When the Government of Gibraltar resumed responsibility for the Reserve, very little money was re-invested into the product. This resulted in an intensification and accumulation of the many problems that one can read about in this report. It is therefore unwise that the Government of Gibraltar maintains this status without recognising how vitally important it is to regularly maintain all aspects of the Nature Reserve. We argue that there should be a concerted effort to re-invest the profits of the gate money of the Upper Rock. This Management Plan, therefore, specifically tackles all areas of concern within the Upper Rock, many of which are particularly important and have a direct bearing on the sustainable interests and development of the Nature Reserve. It focuses particularly on the natural environment, which has been totally neglected by management, but also on other sectors of socio-economic interests, which would complement the running and well being of the Reserve.

This plan will need the implementation of the requirements of the numerous European Directives and Conventions on wildlife and heritage conservation, such as the Bern Convention, Bonn Convention, the Biodiversity Convention, the World Heritage Convention, the EC Birds Directive and the EC Habitats Directive. Some of the requirements were transposed into Gibraltar law¹, but implementation and designation of sites is still awaited. Even implementation alone is insufficient without the enforcement of the 'Nature Protection Ordinance, 1991' law and its subsequent amendments.

1.2 Research

In elaborating this plan we have adopted an open minded approach in considering the requirements, fundamentally for the survival of the Upper Rock as a Nature Reserve, but also including socio-economic interests within the reserve, which ultimately will provide the means for the maintenance and development of the area as a whole. Taking this approach, we identified all departments, agencies and other bodies that had vested interests or participated in any way in the use, control, maintenance or development of the Upper Rock Nature Reserve. These are the stakeholders. In this respect the majority, especially those that had a greater bearing toward the survival or development of the Nature Reserve, were interviewed.

In addition, we embarked on research into uses of the Upper Rock throughout its long history. The Garrison Library was instrumental in furnishing us with numerous books, directories and journals, all of which provided a detailed account of the development of the environment of the Upper Rock and the transitions it has undergone through the ages to the present day. It also provided us with an account of all the articles that were published in the Gibraltar Chronicle in relation to the Upper Rock in the last two years before this report was written, and therefore gave us an excellent background on the condition of the area and the concerns of the general public and political parties.

Additional research was required to assess the condition of the environment. This was undertaken in the field and consisted of the mapping of the vegetation by types, height and species and a census of all the pine trees on the Rock, which was carried out during the spring and summer of 2003. In conjunction with this, invasive species of plants were also recorded and mapped and a detailed account of the findings can be obtained in their respective chapters. The aesthetic nature of the area, the condition of main paths and health and safety aspects were also of prime importance in elaborating the management plan for these specific topics.

Legislation was given priority and the 'Nature Protection Ordinance, 1991' (L/N 11 of 1991) and subsequent additions were scrutinised. A proposed summary of possible improvements and subsequent measures is given. Also included is an account of the necessary implementation, and in particular the *enforcement* of the laws, and consideration is given to many of our findings. In addition, EC directives and conventions that apply to the Upper Rock were investigated. Measures proposed would, in our opinion, improve the situation drastically.

¹ Nature Protection Ordinance, 1991 (Amendment) Regulation, 1995

Transport and traffic were some of the issues that particularly worried us. The visual impact of traffic jams at bottlenecks in the Nature Reserve, the ensuing pollution and the detrimental effect to all sectors spurred us on to analyse this problem. In this respect we established a survey of all traffic, commencing at the beginning of 2003, on a monthly basis. This gave us the necessary figures to be able to quantify traffic flow through the Reserve and make subsequent speculations on environmental impact. This problem is a difficult one to resolve, but there are possible ways in which the interested parties could investigate more environmentally friendly ways in their approach whilst at the same time not undermining their own economic benefits.

Residential areas within the reserve were also investigated. Land Property Services were contacted and a synopsis of the situation was obtained. It emerged that all residents are now owner-occupiers except for the housing complex of Poca Roca, which is still rented accommodation and is the responsibility of the Housing Department. The Town Planning Department closely monitors additions and/or extensions to existing buildings.

Research into the geology and especially caves was carried out and obtained from the Garrison Library in many old books and journals and also the excellent publications and writings by Rose & Rosenbaum (1991) and Palao (*Unpubl.*). Most of the caves were also visited to assess their condition. In addition, historical buildings and World War II installations were mapped and their condition described. We sought the opinion of the two heritage bodies, the Gibraltar Museum and the Gibraltar Heritage Trust, together with the Government's Heritage and Planning Division, on their strategy towards the historical heritage on the Nature Reserve. Their suggestions and comments will form the basis of the proposed programme dealing with this subject.

As part of our investigation into the ways nature reserves are managed we decided to visit a small Nature Reserve in the immediate vicinity. We chose the 'Parque Natural Breña y Marismas del Barbate', a reserve that suited our needs due to several factors that it has in common with the Upper Rock. The Directors of the reserve hosted our visit and provided us with ample documentation that allowed us to make comparisons and include suggestions within our own management plan.

Finally, a note on the style in which this document has been written. The reader may be struck by the occasional repetition of themes from one chapter to another. This is deliberate, given that some people may choose to read some chapters and not others according to their interests and/or responsibilities, and so the same points have to be stressed time and again. In addition, information on each subject being tackled is extensive for the reasons that, a) this provides a greater understanding of the issues raised and, b) literature on many aspects of the Nature Reserve (including much on its wildlife) is lacking.

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2. GONHS and The Nature Reserve

2. GONHS and The Nature Reserve

2.1 Introduction

The relationship between GONHS and the Upper Rock began many years ago. GONHS was originally set up by a group of school students from the Grammar School in 1969 as a bird-watching group. It was composed of approximately a dozen people and was eventually affiliated in 1972 to the 'Gibraltar Society', a cultural institution, as the Gibraltar Ornithological Group. Most of the groups' activities took place within the Upper Rock where most of the recording of bird migration took place. Here the members of the group acquired the necessary experience and skills and more importantly the appreciation of our natural heritage. This encouraged some of its members to dedicate and further their studies in the field of biology and natural history, with some researching and completing their doctoral studies on work done within the Nature Reserve, in Gibraltar. With such an academic base and the contribution of many experienced amateurs in the field, the Gibraltar Ornithological Society was established in 1976. The interest of many members in other fields of natural history, especially flora, bats, reptiles, marine life and lepidoptera prompted the inclusion of 'Natural History' in the title of the society although it still retained the original ornithological connotations due to its historical foundations. Thus the 'Gibraltar Ornithological & Natural History Society' of today saw the light of day in 1982.

2.2 History

In 1977, a GONHS member (John Cortes) prepared a report entitled 'Conservation: A Future? Gibraltar: A Management Plan' (Cortes 1977), which was the first attempt to provide guidelines for overall conservation management within the Upper Rock.

GONHS members who were concerned with the state of the Upper Rock and other areas later brought this to the attention of the authorities. A document entitled 'Environmental Conservation in Gibraltar', published by several members of GONHS under the banner of 'The Gibraltar Environmental Group' (Bensusan, *et al.* 1980) highlighted many of the problems that the Upper Rock is still suffering from. Several recommendations, including greater legal and administrative control, wardening of the Upper Rock, cat control, and the litter problem still form part of environmental problems the Nature Reserve faces now.

In 2002, Charles Perez, also a GONHS member and one of the authors of this report prepared a further report on the Upper Rock (Perez 2001), on which much of this document is based. Despite wide distribution, no action ensued.

2.3 Current Work

The GONHS has been instrumental in researching, documenting and studying the flora and fauna of the Upper Rock for many decades and this was one of the factors that led to the designation of the area as a 'Nature Reserve'. Bird migration has constantly been monitored from Jews' Gate and the Cable Car top station for over 35 years, and a study on the distribution of the flora, reptiles, mammals, Lepidoptera and Coleoptera is ongoing. This has resulted in many publications in scientific journals (e.g., Cortes 1983, 1994a, Cortes 1994b; Linares 1993, 1994; Menez 1993) and has included several books (e.g., Cortes *et al.* 1980; Finlayson 1992; Linares *et al.* 1996) on some of the better-known subjects. GONHS has also produced papers based on the Upper Rock, its development, fauna and flora, habitats and future. All of this has helped situate the Upper Rock as a unique environment within the region of the Strait of Gibraltar.

The establishment of the Jews' Gate Field Study Centre in 1990 set the foundations for the Gibraltar Ringing Group, the only section of the British Trust for Ornithology outside the United Kingdom. This has enabled hundreds of researchers to visit and work on Mediterranean birds within the Upper Rock. During this time the GONHS also prepared the draft for the Nature Protection Ordinance, which was published on the 9th May 1991 (L/N 11 of 1991), and included protection for many species of flora and fauna found within the Nature Reserve. On the 20th June 1991, the Governor, by the Nature Conservation Area (Upper Rock) Designation Order 1991 (Legal Notice No 116 of 1991) in exercise of the powers conferred upon him by section 18 (1) of the Ordinance and after consultation with the Nature Conservancy Council, designated an area of the Upper Rock as a Nature Conservation Area.

The creation of the Gibraltar Trust for Natural History whose trustees were members of the committee of GONHS followed this, and the Lower Bruce's Farm quarters, Governor's Cottage and the PSA nursery came into the hands of GONHS. The former was developed into a research centre and accommodation for visiting students. A healthy relationship with Zurich University through Professor Bob Martin and other similar institutions and universities guaranteed regular visits from students studying in particular the Barbary macaques, but also other wildlife. This programme continues.

A programme for the replanting of indigenous tree species was initiated in the former PSA nursery with the propagation of pine, oak, and carob trees. This goes hand in hand with the

removal of invasive species that is currently taking place there. In addition, some habitat management has also been carried out by GONHS volunteers in areas such Governor's Lookout and Inglis Way, entailing vegetation control in what would otherwise be very dense maquis.

In 1994 the GONHS published 'The Biodiversity Initiative: Gibraltar. A Case for Maintaining Biodiversity' (GONHS 1994). Around this time a group of volunteers with an interest in nature and proud of the natural environment of the Upper Rock, agreed to undertake some habitat management within the Nature Reserve. They successfully demolished the illegal construction at Governor's Lookout and set about clearing the dense vegetation and commenced a pine-replanting programme in the area to replace those that had died in the drought. Other areas have been similarly cleared, but the task for the whole of the Upper Rock would need a total commitment from permanently employed workers.

In 1997 the GONHS was contracted to control the yellow-legged gull population. Most of the culling takes place within the Nature Reserve and therefore GONHS maintains an active presence in the area. The awarding of the contract for the feeding and management of the Barbary macaques in 1999 followed this, and has placed GONHS in an enviable and solid position as the most capable and effective organisation in the management of the environmental heritage of the Upper Rock Nature Reserve.

2.4 The future

GONHS been relied upon to advise on nature conservation and other environmental issues while at the same time, as an NGO, being able to carry out independent work and if necessary publicly take issue with the authorities. This is clearly true within the Upper Rock. While some would question the logic of this arrangement, it is important to judge by the results. There is no doubt that while many things in the Upper Rock need improving, much has been achieved in general terms on nature conservation issues.

The strategy of GONHS, to ensure a constant dialogue with key players, including Gibraltar Government, Ministry of Defence, as well as private firms and organisations has nowhere been

more clearly demonstrated than in the events leading up to the preparation of this report. These relationships are in the interests of all players, in particular of the natural systems that GONHS wishes to protect.

It is for this reason that within its proposals, the Management Plan (chapter 23) includes a key role for GONHS in each of its options. It is inconceivable that the firm base of research, and experience in the principles of conservation that in Gibraltar can only be provided by GONHS should not be used as a basis for the necessary further improvements.



Jews' Gate Field Centre

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3. Legislation

3. Legislation

Wildlife protection laws in Gibraltar are centred around the 'Nature Protection Ordinance, 1991' (L/N 11 of 1991). This item of legislation deals with the protection of plants and animals on the Rock, including those that are rare and endangered, in terms of the conservation of our own indigenous flora, fauna and habitats. Also included in the 'Nature Protection Ordinance' is legislation relating to practices, such as fishing, that affect local natural communities. The Nature Protection Ordinance was drafted using as a guide the UK Wildlife & Countryside Act (1981), the EU Birds Directive, and early drafts of the EU Habitats Directive (see Chapter 4). In addition, more general legislation on the trade of wild animals and plants is included in the Endangered Species Ordinance (L/N 54 of 1990) and its subsequent amendments, incorporating the requirements of the Convention on International trade in Endangered Species of Flora and Fauna (1976) and the European Directives that transposed this.

The 'Nature Conservation Area (Upper Rock) Designation Order 1993' (L/N 51 of 1993) was published in 1993 when the Upper Rock was designated a Nature Reserve, although part of it had already been designated a Nature Conservation Area in L/N 11 of 1991. In it are included all of the wildlife protection laws that are unique to the Nature Reserve¹. These include sections on traffic, introduced fauna, access, administration, protection of wildlife, structures, nuisances and wildlife wardens. The laws that this Designation Order stipulates are not, however, adhered to with any rigour. In fact, it is incredible to see, on examining the Designation Order, that most of these laws are disregarded flagrantly. This is a result of several factors. Ignorance of the law is an important reason behind this, although one has to take into account when saying this that, apart from those with legal training, people are generally oblivious to *most* items of legislation, and yet this does not stop the authorities from enforcing these laws (and in any case, ignorance of the law does not excuse one from breaking it). Having said this, a greater effort should be made to make people aware of some of the more important laws that apply within the Nature Reserve, as has been done, for example, with the erection of signs at sites where tourists view macaques.

A lack of responsibility on behalf of some tour operators and taxi drivers also plays a considerable role. These people are familiar with many of the laws that apply within the Nature Reserve (particularly those banning the feeding of wild animals and litter control laws), and yet do little to stop tourists from breaking the law, even breaking the law themselves frequently. It is commonplace, for example, to observe some tour operators amusing their customers by feeding the macaques (this can be observed daily), an offence that is supposedly punishable by a £500 fine; a fine which has still to be imposed on an offender.



Figure 1. Warning sign at Hayne's Cave Pumping Station site.

¹ i.e. those wildlife protection regulations that apply within the boundaries of the Nature Reserve and are not covered in the 'Nature Protection Ordinance 1991'

Most worrying of all is the lack of enforcement of the law within the Nature Reserve. The Upper Rock Nature Reserve is not patrolled by the Royal Gibraltar Police as often as it should be (given that during our vehicle survey we recorded only a single patrol car accessing the Nature Reserve a few times in 48 days throughout the year). However, the main problem with regard to law enforcement is due to the lack of specialised Wildlife Wardens within the Reserve, whose job it would be to ensure that all of the laws concerning the conservation of wildlife and the environment are enforced. All of these problems are highlighted in the sections that follow, together with lists of proposals that seek possible solutions to these problems.

3.1 Administration

The 'Nature Conservation Area (Upper Rock Nature Reserve) (Fees and Admission) Regulations, 1993' (L/N 50 of 1993) dealt with fees and admissions in the Nature Reserve. This has since been superseded. Section 3² of these regulations stated that '*The fees provided for in regulation 2 shall be collected by Sights Management Limited on behalf of the Gibraltar Tourism Agency and shall be retained by the Gibraltar Tourism Agency for the purposes of the administration of the Nature Conservation Area.*' Sights Management Limited no longer exists on the Upper Rock and the Gibraltar Tourism Agency has been replaced by the Gibraltar Tourist Board, which now manages the Upper Rock Nature Reserve. L/N 50 of 1993 was therefore revoked and replaced with the 'Upper Rock Nature Reserve (Admission Fees) Regulations, 2001' (L/N 137 of 2001), but the resulting item of legislation has been less than satisfactory. Whilst the 2001 regulations supersede the entire L/N 50 of 1993 regulations, no replacement has been provided for section 3, which stated that money paid as fees should be spent on administering the Nature Reserve. In other words, there is now clearly no obligation to spend money gathered at the gates of the Reserve on the Reserve and its administration. What is particularly worrying is the fact that this was done without publicity, possibly surreptitiously, with the result that money earned at the Nature Reserve is spent elsewhere. The possibility that section 3 was not replaced due to an oversight seems less likely. Either way, an amendment to the current regulations should be made stating that money earned at the Nature Reserve gates (or at least a large percentage of this) should go towards the administration, maintenance and conservation of the Nature Reserve.

In addition to L/N 137 of 2001, the year 2001 also saw the introduction of the 'Nature Protection (Amendment) Ordinance, 2001' (L/N 23 of 2001). Section 2³ of L/N 23 of 2001 states that:

The Minister with responsibility for the environment may by order published in the Gazette set-

- (a) the terms and conditions of entry, including times and dates; and
- (b) the fees for entry,

to a nature conservation area or tourist or other sites within or comprising that area in respect of different classes of persons and vehicles.

It is interesting that the Minister with responsibility for the environment should set the fees for entry, given that his ministry is not responsible for the management of the Upper Rock or the money that the Nature Reserve generates. In other words, the Government uses this item of Nature Protection legislation to run a business, with none of the income being used to conserve wildlife or improve the environment, let alone the rest of the Upper Rock. Furthermore, although the Tourist Board's management may be apt for the tourist sites, it is far from ideal from the point of view of management of the natural aspects of the Nature Reserve, which in actual fact comprise the vast majority of the Upper Rock. It is the authors' opinion that the Tourist Board should, if anything, only manage the tourist sites. The actual Nature Reserve should be managed by either a designated private enterprise or a Management Board as recommended in the Management Plan (Chapter 23), and administered by the Department of the Environment under the Ministry for the Environment, Roads and Utilities.

² Pp. 110.

³ Pp. 160.

3.2 Recommendations

1) Legislation should be drafted to state that at least a large percentage of fees should be reinvested in the Nature Reserve, and in broad terms at least how the money earned through admission fees at the Gate is to be spent on the Nature Reserve.

2) A substantial percentage of the fees collected at the gate should be invested in environmental management, heritage, awareness, supervision and research of the Upper Rock Nature Reserve.

3) The Tourist Board should not be responsible for the management of the whole Nature

Reserve. Rather, the Nature Reserve should be the responsibility of a Management Board with the administration duties carried out by the Ministry for the Environment, Roads and Utilities, if it is to be managed as a Nature Reserve at all. This would then mirror the situation found in other countries, where Nature Reserves are better administered and conserved. The Tourist Board should only manage tourist sites. Those sites considered apt for management by the Tourist Board are listed below:

- St. Michael's Cave
- O'Hara's Battery
- Upper Galleries
- Princess Caroline's Battery
- 'City Under Siege' Exhibition
- Moorish Castle (which lies at the edge of the Nature Reserve).

The Upper Rock Nature Reserve should come under the proposed Management Board and be administered by the Ministry for the Environment. This should include the Barbary Macaques, which are currently managed by GONHS for the Gibraltar Tourist Board (the reason for this is fully explained in Chapter 14).

3.3 Traffic

There are several sections in the 'Nature Conservation Area (Upper Rock) Designation Order 1993' which apply, either directly or indirectly, to traffic within the Upper Rock Nature Reserve. These are highlighted below, together with an account of how most of these are not enforced and suggestions for improvements.

3.3.1 Parking

The Designation Order states that '*No vehicle shall be parked in the Reserve except in an area designated for this purpose by the Authority*⁴. There are two main problems concerning parking within the Nature Reserve. Firstly, there are very few suitable areas within the Upper Rock Nature Reserve that are clearly designated as parking areas. Lay-bys, etc. are taken to be parking places by the general public. Most people, locals and tourists alike, park in such places, where no obstruction to traffic occurs. These areas should be clearly demarcated as parking areas.

Taxi and coach drivers, particularly at Jews' Gate, St. Michael's Cave, Prince Phillip's Arch and at Princess Caroline's Battery aggravate this problem. At Jews' Gate taxis and coaches block access to the parking area to private vehicles in order not to lose their queue priority on arrival at the Reserve. This problem is further compounded at St Michael's Cave where, despite the best efforts of the security guards to manage traffic, taxis queue up in the middle of the road preventing access of authorised vehicles to the upper roads. This problem is repeated at Prince Phillip's Arch and at the approaches to Princess Caroline's Battery on Queen's Road, where during the height of the summer, up to twenty vehicles are left unattended in the middle of the road whilst taxi-drivers show their clients the attractions. There have been occasions where the authors have witnessed the emergency services (i.e., ambulance) stuck in the queue at the Jews' Gate ticket office for an inordinate amount of time whilst the security guard tried his best to clear the way. On both occasions none of the public service vehicles moved on and after a long time, only manoeuvred their vehicles sufficiently to allow the ambulance through on a medical emergency. This brings to light the problems that this would pose if a serious fire were to occur on the Upper Rock Nature Reserve. The problem has been exacerbated by the decision to increase the already saturated Nature Reserve by a further twenty coaches, also adding to the noise and pollution levels already prevalent on the Upper Rock Nature Reserve.

3.3.2 Traffic and Noise

The Designation Order requires that a person must not '*use a radio, television, cassette or disc player except where such equipment is fitted with headphones and is operated in such a manner as to be inaudible to any person other than the person wearing the headphones*⁵. This law applies to vehicles within the Nature Reserve. Whilst the authors consider it unreasonable that a person should not be able to listen to music within his vehicle without the use of headphones, the law should state that the volume of the appliance should not be set at a level to cause an unreasonable degree of disturbance to persons and/or fauna within the Upper Rock. The law controlling the volume at which music can be played from a vehicle in other areas of Gibraltar exists, and should be adopted with a clause to include disturbance to wildlife. The regulations should however allow for total prohibition of such noise in particular areas and circumstances (e.g. in the proposed Biological Reserve (see chapters 17, 18 & 23) or close to the nesting site of a rare bird).

⁴ Section 4.(4), pp.114 of L/N 51 of 1993.

⁵ Section 8.(b), pp.117 of L/N 51 of 1993.

Rather more worrying than loud music, though, is the constant use of vehicle horns in certain parts of the Nature Reserve due to traffic congestion. This has been most evident at Jews' Gate, where taxis and coaches that arrived via Lathbury Barracks used to sound their horns constantly in order to be let through the barrier. Since the erection of a second booth addressing this traffic the noise levels and hooting has improved. Sometimes, some of the blame goes to the inconsiderate way in which these tour vehicles, both taxis and coaches, are parked in this area. The sounding of horns is a cause of serious concern given the negative effect that this must undoubtedly have on local, and in particular, breeding fauna.

3.3.3 Access

It is stated in the Designation Order that '*The Authority may, in its discretion and for the purpose of the good management of the Reserve, close or restrict access to any part of the Reserve or to any road or path in the Reserve*'⁶. This is taken by the authors to apply to the temporary closure of paths and roads, possibly in view of road repairs, safety issues, etc. However, it may in some cases also be useful to apply this law for the benefit of the Nature Reserve's wildlife. For example, vehicular traffic could be restricted in certain areas temporarily during the breeding season, if a species that is vulnerable to traffic pollution and/or noise and disturbance is found to be breeding in the area. This is common practice in other Nature Reserves.

The Designation Order also states that '*No vehicle shall be used on the Reserve except on permitted routes or with the prior written consent of the Authority*'⁷. This law has been disregarded excessively. Although traffic is not supposed to ascend beyond St. Michael's cave, it is abundantly clear that most traffic does so. An effort has been made to control this through the use of security guards at the hill leading to St. Michael's cave. However, these people are only present during working hours (09:00 – 17:00), before and after which there is nobody to ensure that anyone '*without written consent of the Authority*' does not drive up beyond St. Michael's cave.

The Government of Gibraltar's decision to grant access to taxis beyond St. Michael's Cave, which dates back to the early 1990s (ironically the time when the Nature Reserve was created), is regrettable. This causes excessive noise and pollution along the upper reaches of the Nature Reserve, as well as a deplorable amount of litter around sites such as Prince Phillip's Arch. Evidence of the amount of disturbance that this activity causes is given, for example, in the drastic decrease in the number of migratory booted eagles (*Hieraaetus pennatus*) (which is considered 'Rare' by BirdLife International, and is protected under Annex 1 of Council Directive 79/409/EEC) roosting along the upper reaches of the Upper Rock Nature Reserve.

The increased level of traffic that currently utilises the roads along the upper reaches of the Nature Reserve may also in the long run cause considerable problems to the infrastructure of these roads, given that these were never designed to support such heavy traffic, having originally been MOD roads (B. Bagu, *pers. comm.*). The effect that this increased stress has on sections of these roads can be seen at the section of Signal Station Road running down to the Governor's Lookout, where part of the road is subsiding. Access along this road has been restricted as a result (although since July 2003, it was sometimes used by taxis and other vehicles, even though access is still restricted, until several barriers were erected).

3.3.4 Access at Night

With regard to access to the Nature Reserve at night, the Designation Order states that '*No person shall enter or remain in the Reserve between sunset and sunrise except with prior written consent of the Authority to do so which consent may specify the part or parts of the Reserve that the person may enter or remain in*'⁸.

There are two main problems that are associated with this section.

The first of these problems is that this law is typically not adhered to. Cars are frequently encountered within the Nature Reserve after sunset, and after the entrance gate (below Jews' Gate) has been locked. This is hardly surprising, given that the barrier at the Moorish Castle end of the Nature Reserve frequently remains open all night, and there is nobody employed to ensure that people do not remain within the reserve after sunset. This could be tackled by the police or, for example, if Wildlife Wardens were employed. Traffic within the Upper Rock Nature Reserve after sunset causes undue disturbance to the fauna of the reserve. Furthermore, activities undertaken after dark within the Nature Reserve are often illegal.

The second problem that arises from this section is that although it states that no person should enter or remain in the reserve between sunset and sunrise, an actual time is not stat-

⁶ Section 3.(3), pp.114 of L/N 51 of 1993.

⁷ Section 4.(4), pp.114 of L/N 51 of 1993.

⁸ Section 3.(3), pp.114 of L/N 51 of 1993.

ed, given that the time at which the sun rises or sets changes throughout the year. It is important to note that the time at which the entrance below Jews' Gate is locked is consistent throughout the year (at about 10pm). In light of this fact, perhaps it would be better to specify a time in the Designation Order in accordance with the time at which the gate is locked.



Figure 2. Closing time is inconsistent with the regulation that does not allow anyone after sunset, especially in the winter months.

Although virtually all persons encountered within the Nature Reserve after dark are in vehicles, pedestrians are not exempt. This section of the Designation Order not only applies to motor vehicles, but also to pedestrians, and should be applied to these with equal rigour.

3.4 Recommendations

1) Areas that are suitable for parking within the Nature Reserve should be clearly demarcated as being so. At present, many of these areas are not properly designated as parking areas.

2) The Designation Order should be amended to include a section or sub-section on obstruction of roads by cars, particularly taxis and coaches (at places such as St. Michael's Cave and Prince Phillip's Arch). The problem of obstruction by taxis and coaches could be alleviated by restricting access to all roads beyond St. Michael's Cave, given that there are two other sites for Barbary Macaques, namely Haynes Cave pumping Station and Princess Caroline's Battery, which were not available when access was granted for taxis to reach the Prince Phillip's pack. This would also reduce noise pollution and emanations and relieve the taxi and coach drivers' fuel bill.

3) Anyone with authority to enforce the sections specified in the Designation Order should have the power to stop and fine the driver of a vehicle if that vehicle is playing music at a volume that is causing a nuisance and that is audible from outside the vehicle. Persons with this authority should include the Royal Gibraltar Police and Wildlife Wardens.

4) A serious effort should be made to reduce the amount of horn sounding that occurs in some areas of the Upper Rock Nature Reserve. This is not in any way consistent with the aims of a Nature Reserve, and does not give tourists a good image of the way that such areas are managed in Gibraltar. This horn sounding could be tackled, for example, through more sensible use of parking by taxis and coaches and through a little patience by the drivers of these vehicles.

5) The Management of the Nature Reserve should consider temporary restrictions of access along roads or paths for the purpose of road repairs, safety issues or wildlife concerns.

6) It is the authors' opinion that all vehicular access, including public service vehicles, to the upper reaches of the Nature Reserve should be restricted unless the reason for use is consistent with wildlife conservation aims, Nature Reserve staff requirements or emergency and essential vehicular use.

7) Residents of the Upper Rock Nature Reserve should be issued with an Upper Rock Nature Reserve disk, which should be displayed on the windscreen and which permits authorised access to their residences via Willis's Road, through the barrier at Moorish Castle entrance, after closing time.

8) Closing and opening times to be amended and set at 07:00hrs and 22:00hrs during the change to summer time at GMT+2 and set at 07:00hrs and 20:00hrs during the change to wintertime at GMT +1. These opening and closing times should be known as the 'specified time'.

9) The barrier at the Moorish Castle should remain down after the specified time, unless the driver of the vehicle requesting entry to the Nature Reserve is a resident with a valid Upper Rock Nature Reserve disk, or guest of the same and produces proof of permission or identity and specifies location or residence where he will be visiting. In this last case, visitors should only be allowed to proceed after the Security Guard confirms destination via a phone call to the residence in question.

10) An effort should be made to ensure that no person without permission remains within the Upper Rock Nature Reserve after the specified time. This could be achieved through patrolling, following the recruitment of Wildlife Wardens.

11) The time at which no person shall remain within the Nature Reserve in the evening should be clearly stated in the Designation Order. After these hours, authorised access to the Nature reserve should be via Willis' Road at the barrier at Moorish Castle.

12) The security guard must close the gates at Lathbury Barracks at the specified time in conjunction with the main gates on Engineer Road in order to ensure no unauthorised access.

3.5 Vandalism, Defacement and Litter

Litter poses one of the Nature Reserve's greatest problems. It can be seen everywhere, lining the roads and accumulated around sites, and does much to mar the aesthetic appeal of the Upper Rock. The Designation Order states that '*No person shall, in the Reserve, ... deposit litter or waste*'⁹, yet the amount of litter that can be seen within the Nature Reserve, particularly around popular stopping points, is of grave concern (see Chapter 5, section 5.1). Although legislation exists, laws are typically not enforced (due mostly to the fact that usually, there is nobody present to enforce such laws). The visual impact that litter causes within the Nature Reserve is illustrated in Appendix 2.

Similarly, large areas of the Upper Rock have been vandalised and defaced with graffiti. Graffiti is evident, for example, at Spur Battery (graffiti was actually painted over during August 2003, but has since returned) and O'Hara's Battery. Vandalism is of particular concern given that amongst structures and objects vandalised are fire-fighting cisterns and equipment (see Chapter 11). Although vandalism, and in particular graffiti abounds on the Upper Rock, this is restricted to roadsides and areas with very easy access, and could therefore be tackled effectively with relative ease.

The Designation Order states that '*No person shall damage or deface any structure including any natural structure in the Reserve*'¹⁰. In addition to this, more general legislation against vandalism and defacement exists. The problem here, once again, is that of enforcement of legislation and regular policing. If there is an absence of a police or warden presence within the Nature Reserve, then these practices will continue.

⁹ Section 8.(a), pp.117 of L/N 51 of 1993.
¹⁰ Section 6.(2), pp.116 of L/N 51 of 1993.

3.6 Recommendations

1) A greater effort should be made to clean the Upper Rock effectively, as is described in more detail in Chapter 5.

2) It may be an idea to place CCTV cameras at spots where large amounts of litter are deposited. This would not only expose offenders, but also act as a deterrent to those who are about to commit an offence.

3) Tour operators should be held responsible for the actions of their clients. This should apply to litter offences as well as to the feeding of the macaques. In this way, tour operators

would be encouraged to properly inform their clients that litter should not be discarded and macaques should not be fed, and that these practices constitute breaches of the law.

4) Police and/or Wildlife Wardens should be present within the Nature Reserve to ensure that acts of vandalism and defacement, and the deposition of litter do not take place.

3.7 Buildings and Structures

The Designation Order states that *'No person shall erect whether permanently or temporarily any structure which may obstruct the visibility of the Reserve or change the appearance of the Reserve except with the prior written consent of the Authority and subject to such conditions as the Authority may impose for the protection of the Reserve'*¹¹. One of the problems regarding this section is that it refers to the written consent of the Authority (at present the Government) and makes no reference to the Nature Conservancy Council, or for that matter the Heritage Trust. This is of some concern, given that the interests of the Government may sometimes be at odds with the aims of the Nature Reserve and its effective conservation. The most notable proposal for a new structure was the 'Lumen Christi' Millennium sanctuary that was proposed by the Catholic Church for the area just behind the cable-car top station in 1999. Although allegedly the Government originally favoured the erection of this shrine, it did in fact go against not only legislation, but also 'The Gibraltar Development Plan' (1991). This contains a policy on the Upper Rock known as 'Policy Z19', which states that:

'Planning Permission will only be granted for new development within the Upper Rock Nature Reserve where it can be demonstrated that:

- (1) It is compatible with the preservation and enhancement of the existing character of the area,*
- (2) There is no adverse environmental effect,*
- (3) Any permanent buildings are:*
 - (a) essential*
 - (b) of limited size, and*
 - (c) are located and designed so as to fit into the Natural Landscape.'*

The 'Lumen Christi', even when reduced in size response to public objections, failed to meet these objectives (see Gibraltar Nature News No. 6), and after a lengthy public debate in which popular opinion turned against the idea of the shrine, the Catholic Church finally aborted this enterprise. Similarly, permission should not be granted to any project that would affect the integrity of the Nature Reserve.

On the subject of existing dwellings within the Nature Reserve, 'Policy Z20' of 'The Gibraltar Development Plan' (1991) states that:

'The extension and replacement of existing dwellings within the Upper Rock Nature Reserve will only be considered in exceptional circumstances, and will be subject to the following criteria:

- (1) They satisfy the criteria contained in policy H9*
- (2) There is no increase in the site area, and*
- (3) The amount of accommodation does not exceed the existing dwelling by more than 20%.'*

In actual fact, plenty of work seems to take place in all residential areas of the Upper Rock, and this regularly seems to include extensions. If permission has been granted in all cases, then circumstances do not seem to be as exceptional as suggested in the development plan.

¹¹ Section 6.(1), pp.116 of L/N 51 of 1993.

3.8 Recommendations

1) No building or structure should be erected within the Upper Rock, without prior approval from the Board of Management, and then only for the purposes of the administration and conservation of the Nature Reserve, or the enhancement of existing and future tourist sites.

2) Section 6.(1) of the Designation Order should be amended to include the phrase, *'...except with the prior written consent of the Authority, in consultation with the Nature Conservancy Council...'*

3) Policies within 'The Gibraltar Development Plan' pertaining to the integrity of the Upper Rock as a Nature Reserve should be included within the 'Nature Conservation Area (Upper Rock) Designation Order'.

3.9 Wildlife Wardens

The 'Nature Conservation Area (Upper Rock) Designation Order 1993' includes a section concerning Wildlife Wardens. Some of the issues concerning this matter are highlighted in the sub-sections below.

3.9.1 The Wardens' Powers

Section 21 of the 'Nature Protection Ordinance, 1991' deals with the appointment of Wildlife Wardens in Gibraltar, appointed by the Governor after consultation with the Nature Conservancy Council, either professional or honorary¹², adding that the Governor '*...may make regulations for the purpose of determining the powers and duties of any person appointed...*'¹³. It is interesting to note that authority is handed to the Governor, who both appoints and regulates the Wildlife Wardens. Although the former is done after consultation with the Nature Conservancy Council, the latter is left solely to the Governor. Although in these cases 'Governor' is usually deemed to read 'Government', in either case it is the authors' opinion that the 'Governor' should refer to the Nature Conservancy Council in all matters relating to Wardens and not just to their appointment.

More specifically, in relation to the Upper Rock Nature Reserve, section 9.(1) of the 'Nature Conservation (Upper Rock) Designation Order, 1993' states that '*Any person appointed as a Wildlife Warden in accordance with section 21 of the Nature Protection Ordinance 1991, shall carry out such duties in the Reserve as the Authority shall specify and shall have the power, in the Reserve, to stop any person who, it appears to the wildlife warden, has failed to comply with the requirements of these regulations and require that person to give to the warden details of the person's name and address evidenced by the production of an identity card or passport*'. Again, the 'Governor' should not hold absolute power in this matter, and everything should be carried out in consultation with the Nature Conservancy Council.

The powers of the Warden within the reserve are given in section 9.(2) of the Designation Order, which states that '*Any wildlife warden shall have, in the Reserve, the powers specified in section 16 of the Nature Protection Ordinance 1991*'. Section 16 of the 'Nature Protection Ordinance, 1991' (pp. 65) gives a person appointed to enforce the Ordinance power to stop and search any person suspected of committing an offence and to seize any evidence for the purposes of proceedings. This clearly does not go far enough in elucidating the role and powers of a Warden. The Warden's role should thus be specified to include the implementation of all laws within the Designation Order that concern the Conservation of wildlife and the environment within the Nature Reserve.

3.9.2 Application of Section 9 of the 'Nature Conservation Area (Upper Rock) Designation Order, 1993'

The section dealing with the introduction of Wardens into the Nature Reserve, section 9, is one of the most important sections contained in the Designation Order, in that it is vital to the implementation of wildlife protection laws within the Nature Reserve. Given the vital importance of Wildlife Wardens within any nature reserve, it is tantamount to the gross mismanagement of the Upper Rock Nature Reserve that our Reserve has, for many years, found itself without any Wildlife Wardens. This is extremely worrying, given that the Reserve finds itself in a state of dereliction and deterioration. Also, the macaques, our largest economic asset within the reserve, find themselves being fed and harassed constantly, due to there not being any authority to ensure that this does not happen (see Chapter 14, on Barbary macaques for more details). Wildlife Wardens are therefore desperately needed in the Upper Rock Nature Reserve if it is to carry on being a site of considerable importance for wildlife.

¹² Section 21.(1), pp.71 of L/N 51 of 1993.

¹³ Section 21.(2), pp.71 of L/N 51 of 1993.

3.10 Recommendations

1) Section 9 of the Designation Order does not specify the number of Wardens that should be appointed in the Upper Rock Nature Reserve. There should be at the very least a minimum of six Wardens employed by the Nature Reserve to cover the 40% of Gibraltar that comprises the Nature Reserve. This is vital given the pressures that are exerted on wildlife in the Nature Reserve by the very large number of tourists who enter it daily.

2) Granting certain people the title of 'honorary warden' may also prove useful, in addition to the appointment of professional wardens. For example, people who are employed by GONHS for the maintenance of macaques or gull culling, and who are knowledgeable in matters of Natural History and spend a considerable amount of time within the Nature Reserve could be appointed as 'honorary wardens'. This would allow them to take action upon anyone who they witness to be in breach of wildlife protection laws.

3) All wardens should have considerable experience in matters of natural history, and should be well versed with all of the Gibraltar wildlife protection laws that apply within the

Upper Rock Nature Reserve.

4) All wardens should have a knowledge and understanding of matters relating to the Upper Rock's historical value, and should be willing to act as a ready source of information, should any visitor to the Nature Reserve have any queries.

5) The 'Governor' should not have exclusive authority over the appointment and role of Wildlife Wardens. All sections or sub-sections which do not already do so should be amended to include the words '...after consultation with the Nature Conservancy Council,' when a decision is to be made by the Governor. This applies both to section 9 of the 'Nature Conservation Area (Upper Rock) Designation Order 1993' and to section 21 of the 'Nature Protection Ordinance, 1991'.

6) The 'Nature Conservation Area (Upper Rock) Designation Order 1993' should be amended to include a detailed account of the Wardens' responsibilities and authority. This should include authority to enforce any law that deals with the conservation of wildlife and the environment, within the Nature Reserve. It should also include a responsibility to have a constant awareness of all matters that are of environmental and/or wildlife concern within the Nature Reserve.

7) Most importantly, an effort should be made to employ Wildlife Wardens within the Nature Reserve as soon as possible, as this is vital in ensuring that the Upper Rock's natural heritage is properly conserved.

8) Finally, the Designation Order uses the term 'Wild Life Warden'. This should be changed to 'Wildlife Warden', which is the correct term for such a position.

3.11 Disturbance to Fauna

Although considerable disturbance is caused to fauna within the Upper Rock Nature Reserve, little direct disturbance actually occurs. The vast majority of disturbance is caused indirectly, through such factors as unrestricted access to traffic, traffic at night and excessively loud music. There have been instances in the past where there have been problems with finch catchers in the autumn and with persons hunting rabbits and partridges with air rifles and/or dogs. Fortunately, this appears not to have happened now for a number of years. There are, however, a few cases where direct, deliberate disturbance has occurred recently, or still occurs regularly. These are highlighted below.

3.11.1 Bats

The Designation Order decrees that no person may (without written consent) '*enter in to any cave or tunnel used as a roost by bats*'¹⁴. It is worrying to note that a great deal of disturbance has in the past been caused at sites that are used as a roost by bats. Noticeable in this respect is Martin's cave, which regularly held very large numbers of bats. For example, during the 1960's, an estimated 5000 Schreiber's bats *Miniopterus schreibersii*, and 1000 large mouse-eared bats *Myotis myotis*, were recorded in this cave (Palao, *Unpubl.*). However, no bats were recorded during a survey carried out during December 2002 (Santana, A., *pers. comm.*).

Martin's Cave has suffered greatly from repeated intrusions, particularly from youths, who have at times deliberately disturbed the bats to the extent of setting fireworks off within the cave. Grilles have been placed at the entrance to the cave on several occasions to prevent people from entering, but these have been repeatedly vandalised. Apart from contravening Section 5.(1)(c) of the Designation Order, it also goes against Section 6.(2)¹⁵, which states that '*No person shall damage or deface any structure including any natural structure in the Reserve*'.

All bat species are protected under the 'Nature Protection Ordinance, 1991'. Furthermore, *Miniopterus schreibersii* and *Myotis myotis* are protected within the 'Habitats Directive' under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. This Directive not only recommends the conservation of these species, but also their habitats, stating that 'These caves and feeding habitats require designation as Special Areas of Conservation (SACs)'. An effort has been made over the years to protect both populations of these bats *and* their roosting sites. However, this effort has largely been a result of hard work by volunteers rather than by local authorities or the Upper Rock management, who are actually responsible for this. As a result, the effort has not been adequate in ensuring the conservation of these bats and their habitats.

Council Directive 92/43/EEC also specifies that the feeding habitats of these bats should be conserved. These bats feed within the Upper Rock Nature Reserve, especially in open

¹⁴ Section 5.(1)(c), pp.115 of L/N 51 of 1993.

¹⁵ Pp. 116.

areas, such as firebreaks. Most of the firebreaks on the Upper Rock are mismanaged and are becoming increasingly dense (see Chapter 11), and are consequently becoming unsuitable as bat feeding sites. Bats provide just one of the reasons why firebreaks should be cleared regularly. Bats could also, for example, be feeding over the newly restored Great Sand Slopes of the East Side, which as yet has no formal protection. Legislation should therefore be provided to ensure that feeding habitats for these species are conserved.

3.11.2 Barbary Macaques

Barbary macaques within the Upper Rock Nature Reserve present a considerable problem from a conservation perspective, given that they are unique in that they freely interact with humans. All of the problems associated with these animals are dealt with in the Chapter on Barbary macaques. However, two specific points need to be highlighted here in relation to the 'Nature Conservation Area (Upper Rock) Designation Order 1993'.

The Designation Order states that it is illegal to '*feed any wild animal within the reserve*'¹⁶, adding that it is also illegal to '*disturb any wild animal or wild bird in the reserve*'¹⁷. Whilst this first part was included largely in view of the way that macaques are fed by tourists and locals alike, it is blatantly disregarded. Furthermore, macaques are frequently disturbed and harassed whilst being fed or observed by tourists and locals. As mentioned above, this is dealt with more fully in the Chapter on Barbary macaques (see Chapter 14).

¹⁶ Section 5.(1)(i), pp.115 of L/N 51 of 1993.

¹⁷ Section 5.(1)(j), pp.115 of L/N 51 of 1993.

3.12 Recommendations

1) There should be a greater effort to ensure that people, who have not obtained prior consent from the proposed Cave Management Committee and from the Nature Reserve Management, do not enter caves or tunnels that are used as roosts by bats. A list of these caves should be included as an amendment to the 'Nature Protection Ordinance, 1991'. Protective grilles should be placed at the entrance to any cave or tunnel that is of importance to roosting bats within the Upper Rock Nature Reserve, and these should be checked on a regular basis to ensure that they have not been vandalised. This work should be carried out by those departments responsible for this, namely the management of the Upper Rock.

2) Natural areas that are important as feeding sites for bats should be protected in accordance with Council Directive 92/43/EEC. This should include sites that fall outside the boundary of the Upper Rock Nature Reserve.

3) Recommendations for the Barbary macaques are dealt with in Chapter 14.

3.13 Introduced Fauna and Flora

The 'Nature Conservation Area (Upper Rock) Designation Order 1993' includes sections dealing with the introduction of faunal and floral species which are not indigenous to the Upper Rock. Section 5.(1)(h) of the Designation Order states that it is illegal to '*introduce any animal or plant which is of a kind which is not ordinarily resident or is not a regular visitor to Gibraltar in a wild state or does not grow in the wild in Gibraltar, as the case may be*'. As with most sections of this Designation Order, these laws are, for the most part, ignored. This is highlighted in the next sub-sections.

3.13.1 Domestic cats

A rapidly growing number of domestic cats *Felis catus*, can be found within the Upper Rock Nature Reserve. This is nowhere more obvious than in the St. Michael's cave area and the Upper Galleries, where cats are routinely fed. This increase in cats within the Nature Reserve is of grave concern, given the devastating effect that the introduction of domestic cats has had on native faunas all over the world. Our native rabbit *Oryctolagus cuniculus*, Barbary partridge *Alectoris barbara*, and white-toothed shrew *Crocidura russula*, populations are particularly vulnerable to predation from domestic cats, especially given that the populations of these species within the Upper Rock, particularly the rabbit, are becoming increasingly depauperate.

Apart from contravening the section highlighted above, this also goes against section 5.(2) of the Designation Order, which states that '*...no animal other than a wild animal, may be taken into or kept in the Reserve*', given that once inside the Reserve, these animals are also being actively fed, and encouraged to stay within the Reserve boundary.



Figure 3. A domestic cat at St. Michael's Cave, within the Nature Reserve. Cats are routinely fed at this site, where up to sixteen cats have been seen together.

The 'Nature Conservation Area (Upper Rock) Designation Order 1993' should therefore be amended to include a section stating that it is illegal to feed an exotic species within the Upper Rock Nature Reserve, given that at present, it is only illegal to '*feed any wild animal within the reserve*'¹⁸. Although this can and should apply to introduced animals such as cats, exotic species are not sufficiently specified.

3.13.2 Feral goats

There is currently a population of feral goats in the Royal Anglian Way area consisting of between twenty and thirty individuals, as well as a smaller population consisting of about a dozen individuals in the area below Rock Gun. These animals originate from several goats that were imported into Gibraltar illegally and kept just above the Upper Town area. The goats, although kept outside of the Nature Reserve, frequently made their way into the Nature Reserve limits, being frequently seen in the Bruce's Farm area. Whilst the Designation order clearly states, in section 5.(1)(f), that it is illegal to '*graze or permit to graze any domestic livestock*', the owners of the goats apparently made no attempt to stop this from occurring, to the extent that the goats eventually stayed within the Nature Reserve permanently.

3.13.3 Pets

It is clearly evident, when walking past houses within the Nature Reserve, that many people living within the boundaries of the Upper Rock like to keep pets within their homes. It is commonplace, for example, for people living within the Nature Reserve to keep dogs. Also, a number of residents have aviaries, as well as other pets. Whilst the 1993 Designation Order states that '*Any person resident in the Reserve or having the exclusive use of property in the area of the Reserve, may apply for a licence to take into the Reserve, an animal other than a wild animal*'¹⁹, it is doubtful whether any of the residents in the Upper Rock Nature Reserve have a specific licence to keep pets within the reserve.

Some of the residents and workers of the Upper Rock keep chickens, pheasants and peacocks as pets. These are, in some cases, allowed to roam in areas of the Nature Reserve adjacent to the homes or places of work in which they are kept. For example, one frequently encounters peacocks and pheasants in the garden at Bruce's farm, and these birds belong to one of the neighbouring houses. Similarly, chickens and pheasants can be seen roaming freely at Bruce's Farm, the PSA Nursery, St. Michael's Cave, the area south of the Cable Car top station and on the road that leads to Farrington Battery and the Upper Galleries. This is illegal, as section 5.(1)(f) of the Designation Order, which states that it is illegal to '*graze or permit to graze any domestic livestock*' applies to poultry²⁰. These free-

¹⁸ Section 5.(1)(i), pp.115 of L/N 51 of 1993.

¹⁹ Section 5.(3), pp.115 of L/N 51 of 1993.

²⁰ Section 2.(1), pp.113 of L/N 51 of 1993.

roaming chickens, pheasants and peacocks are particularly worrying in that they occupy similar niches to our Barbary partridge and are therefore in direct competition with these birds. In addition, domestic fowl are known carriers of diseases that can be transmitted to similar species (such as the partridges), and some that are even dangerous to humans.

3.13.4 Flora

A number of introduced species of plants are to be found on the Upper Rock in a wild state, some of these fully naturalised, i.e., with a regularly occurring, self-sustained population. These include *Pelargonium inquinans*, *Lantana camara*, *Oxalis pes-caprae*, *Aloe arborescens*, *Senecio angulatus*, *Chasmanthe floribunda*, *Freesia refracta*, *Tecoma capensis*, *Carpobrotus edulis*, *Agave americana* and *Ailanthus altissima* (for more information on these see Chapter 8). Some species of exotic plants do not seem to pose a threat to the indigenous flora of the Upper Rock Nature Reserve. For example, healthy individuals of both *Eucalyptus camaldulensis* and *E. globulus* survive where they were originally planted, but it is unlikely that these trees will spread beyond these roadside sites, due to both the shallow depth of the soil on the Upper Rock and a seeming inability to establish themselves in this habitat through seed. Similarly, species such as *Pelargonium inquinans* and *Aloe arborescens* seem to have a limited dispersal ability within the Nature Reserve.

There are, however, some introduced species that give cause for concern. For example, it is illegal in South Africa to keep the exotic *Lantana camara* (which is native to the West Indies) in gardens (A. Abrines, *pers. comm.*), given the rapidity with which this species invades neighbouring habitats. Although *Lantana camara* is not found extensively within the Upper Rock it is encountered with increasing frequency in the area between the entrance to the Nature Reserve and Jews Gate, no doubt having spread from the gardens in the Mount area. The fruit that this plant produces is frequently taken by birds, which then deposit the seeds in their droppings. This plant therefore has the potential to spread all over the Nature Reserve in a short period of time, given the mobility of the birds that feed on these berries.

Another plant that is of considerable concern is the South African creeper *Senecio angulatus*, which also grows in and around Ince's and Upper Bruce's Farms. Its yellow flowers are clearly visible from town during December, when it can clearly be seen to be dominating the whole area. Furthermore, this species grows profusely just outside the boundary of the Nature Reserve, where it can be seen to be dominating over the local flora. The species is especially prevalent in the area behind the Rock Hotel. It is worrying to note that this species may spread into the Upper Rock Nature Reserve with ease in the near future.

The Designation Order states that it is illegal to introduce a plant that is not found naturally on the Upper Rock within the Reserve²¹. This includes the residences and built up areas. The authorities need to monitor the introduction of exotic plant species to gardens within these residences within the Upper Rock. Specific wording is necessary in the said legislation, such as has been done in the case of animals, in section 5.(3). It is reasonable for residents to be able to plant exotics in their gardens, as long as they pose no threat to the local flora and in particular do not clash with and spoil the character of the Nature Reserve. Measures should be taken to ensure that those species that are potential invasives are not be planted. These points are further emphasised in Chapter 8.

3.13.5 Peripheral Areas

At present, there is no legislation concerning the threat that activities in peripheral areas to the Upper Rock could pose to the Nature Reserve. This is rather worrying, given that some of the species that currently pose, or threaten to pose problems within the Nature Reserve have originated from houses or sites immediately outside the Nature Reserve boundary. This is the case, as illustrated above for example, with the domestic goats, and is probably also what has contributed most significantly to the rapid inflation of the domestic cat population within the Nature Reserve in recent years. The same can be said of *Lantana camara* and *Senecio angulatus*, both of which seem to have originated from the gardens immediately outside as well as within the Nature Reserve.

'Policy Z21' of 'The Gibraltar Development Plan' (1991) deals with areas that are peripheral to the Nature Reserve, where it states that:

'Within areas adjacent to the boundaries of the Nature Reserve new development will normally be restricted to:

- (1) Essential infrastructure works,*
- (2) Limited low-density residential proposals,*
- (3) Tourism projects.*

²¹ Section 5.(1)(h), pp.115.

It is encouraging to see that the Development Plan recognises the importance of peripheral areas to the Nature Reserve. However, this should not be restricted to town planning alone, and wildlife conservation considerations should be included in light of the obvious sensitivities of the Nature Reserve.

3.14 Recommendations

1) There should be an active programme designed to eradicate feral domestic cats *Felis catus*, from within the Reserve, given that they are not native to the Upper Rock and pose a serious danger to the wildlife of the Nature Reserve. Sterilising cats and releasing them is not enough as these individuals will continue to hunt the native wildlife and in any case the subsequent release is illegal.

2) Section 5.(1) of the 'Nature Conservation Area (Upper Rock) Designation Order 1993' should be amended to include legislation regarding the feeding of exotic (i.e., non-native) species within the Nature Reserve, so that feeding is prohibited. Providing that it is enforced, this should ensure that cats are not fed within the Upper Rock, as currently occurs. Although the authors feel that this is already covered in the Designation Order, it is somewhat ambiguous in this respect, and clearer wording is required.

3) There should be separate terms in the legislation for indigenous fauna and introduced fauna, as the term 'wild animal' is quite ambiguous in this respect.

4) The feral goats on the Upper Rock must be removed, given that several young are born each year, and if the population grows further, this could result in habitat degradation and erosion. This also conflicts with plans to introduce large herbivores (see Chapters 10 & 13).

5) Residents who keep pets within the Nature Reserve should apply for a valid licence for these pets.

6) All chicken runs and poultry should be removed from the Upper Rock, as this goes against Section 5.(1)(f) of the Designation Order, and these birds could conceivably compete with our local Barbary partridge for food and territory, and also pass on diseases to our native birds.

7) Section 5.(3) of the Designation Order should be amended to include control over the introduction of exotic plant species into gardens belonging to homes within the Upper Rock. As part of this, a list should be legally adopted containing potentially invasive species that are not allowed to be grown within the Nature Reserve boundary. A proposed list of these plants is given in Chapter 8, section 8.12, which deals with invasive and potentially invasive exotic flora.

8) Gardens within the Upper Rock Nature Reserve boundary should be checked on a regular basis (e.g., annually) by a competent authority to ensure that no potentially invasive plants that may endanger the local flora are grown in these gardens. This authority should have the power to decide whether species grown in gardens are potentially problematic or not, regardless of whether or not they are actually listed as so, and should consequently have the power to add species to this list.

9) In cases where exotic plant species have already been introduced into the Upper Rock Nature Reserve, programmes should be initiated for the purposes of eradicating problematic species. These are described in Chapter 10.

10) Legislation should be created to control what animals or plants are kept in peripheral areas to the Nature Reserve. A buffer zone should be created around the reserve, to include the areas of the lower slopes below the western cliffs, and all vegetated areas between the Nature Reserve's boundary and the town area. This area should include the areas below Devil's Gap and extend behind the Rock Hotel, behind the Casino and include the Humphrey's Bungalows area where the Nature Reserve's boundary is met. It should also include the Lathbury Barracks Industrial Park as a peripheral area within this buffer zone. Special licences should be required in this buffer zone to keep pets, and a prohibition on the growth of certain species of plants as proposed in the list in recommendation 7 above.

3.15 Poisons

The 'Nature Protection Ordinance, 1991' (L/N 11 of 1991) and subsequent legislation concerning nature protection and the Upper Rock Nature Reserve, do not cover the use of poisons, herbicides, fungicides or pesticides. The indiscriminate use of these frequently affects and kills other species that are not targeted, and has the potential of eliminating protected species such as the northern raven *Corvus corax*.

The species most frequently targeted by poison in the Nature Reserve is the black rat *Rattus rattus alexandrinus*. This animal, although originating from Asiatic countries, can now be considered fully naturalised on the Upper Rock, and this subspecies survives mainly on berries, fruit and seeds occurring naturally in the Reserve. Occasionally, pockets of higher densities of this species are found where food supplies or discarded food items abound, and as we well know from our Barbary macaques, an animal will take advantage of an easy food source. The areas around Jews' Gate, St. Michael's Cave, the Ape's Den, Cable Car Top Station and Upper Galleries are the locations where on occasions the Tourist Board has received complaints of rat infestation. It is no coincidence that these areas hold the highest densities of humans within the Nature Reserve. It must be stressed that this problem is the making of man and often care taken in preventing or disposing of accumulations of rubbish can prevent rat problems occurring in the first place.

Usually it only takes the report of the sighting of a rat in a tourist site to ring alarm bells. During the winter months these animals often prefer the warmer temperatures of the caves and tunnels, and it is very often in these two places where these animals have been targeted. In such cases the Tourist Board inform the Environmental Agency, which then plants poison inside these sites, and lays the matter to rest. In such cases the rats will ingest the poison and will often wander about before dying. This may not necessarily take place inside the building, cave or tunnel that was being tackled, and sometimes the animal will die out in the open where it will be consumed by other animals, which will also die in the process. Even in the cases where the rat dies inside a site, there is a community of invertebrates that consume the body as part of the natural cycle of decomposition, and subsequently these smaller animals will die in the process. The point made is that poisons are an indiscriminate way of eliminating the problem, and one that obviously eliminates more animals than are targeted. All this is happening within a *Nature Reserve*. It is important in this respect to point out once again that some of the species that are vulnerable to poisons are protected by law.

It is unclear whether residents of the Nature Reserve use poisons within their homes. However, given that poisons are commonly purchased and administered by people who have problems with pests, it is likely that they do so. The use of poisons by private individuals within their residences in the Upper Rock Nature Reserve is not currently monitored. Since poisons can have an impact on animals other than pests, residents of the Upper Rock should be instructed to report infestations of pests to the management of the Upper Rock Nature Reserve rather than taking the matter into their own hands. The management of the Nature Reserve should then advise on the best ways to tackle the problem. In addition, the unauthorised use of poisons should be banned within the Upper Rock Nature Reserve.

There are adequate trapping methods that will only target specific species of a particular size and strength, and this means that only rats and possibly the occasional mouse will be caught. Moreover there are live trapping methods that will capture more than one individual within the same trap, and also traps that will kill the rat instantly. These are preferable to poisons. The results of the method employed are more easily monitored in this manner, and the density of the infestation can be quantified and analysed more accurately. In the case of poisons, only the occasional rat that is found dead will give any indication of the success of the method. There again, live trapping requires regular monitoring of the traps, but the benefits to the Reserve outweigh the minor disadvantage that the effort entails.

In the same way, the use of chemicals for the control of vegetation or treatment of wooden structures against fungi or termites, or chemical control of ants, etc. within the Nature Reserve must be regulated. Any chemical agent has the effect of attacking other non-target species, and adequate legislation needs to be drawn up to restrict the use of these agents within the Nature Reserve. This should apply to all persons using poisons within the Nature Reserve, including those under contract by the management authorities.

3.16 Recommendations

- 1) There should be a total prohibition on the use of poisons within the Upper Rock Nature Reserve, i.e., pesticides, herbicides and fungicides.
- 2) The use of live trapping methods for vermin should be encouraged.
- 3) There must be monitoring and analysis of the degree of any infestation problem, which, using the methods applied at present, cannot be quantified.
- 4) The use of herbicide or fungicide for specific target species should be authorised only under supervision by qualified personnel. Supervision should consist, not only of the chemicals and methods used, but also of the species targeted and other flora found in the area, which might be sensitive and in need of protection.

3.17 'The Authority'

The Nature Protection Ordinance makes repeated reference to 'The Authority', which is defined as '*Authority means the Government or such undertaking as may be appointed by the Government from time to time to be the Authority*'²². During the years that Sights Management Ltd managed the Upper Rock, this company served as the Authority. Whenever nature conservation aspects were directly involved, this was usually in consultation with GONHS. The body that shall serve as the Authority needs to be identified. This should be the Board of Management or its equivalent (see Chapter 23).

²² Section 2.(1), pp.113 of L/N 51 of 1993.

3.18 The Role of the Royal Gibraltar Police

The following information is based mainly on our analysis of an interview with P.C. Andrew Fortuna, Wildlife Liaison Officer with the Royal Gibraltar Police.

The Wildlife Liaison Officer is responsible for matters dealing with the relationship between wildlife and the law. In this respect, he is responsible for liaising with environmental and natural history organisations and authorities, and providing a point of contact between them and the police. In actual fact, the Wildlife Liaison Officer spends very little time on wildlife duties, and only acts in this role on some of the occasions when environmental and wildlife matters are brought to the attention of the police.

P.C. Fortuna was appointed to the role of Wildlife Liaison Officer in November 2002 approximately a year after the position had been vacated (the previous WLO, Mr Albert Yome, left the service), and only after insistence by GONHS to the Royal Gibraltar Police that the position should be filled. There was no official handover, and it was therefore impossible for PC Fortuna to liaise with the previous WLO. He has only been able to do this through his relationship with Mr Yome within GONHS. Mr Fortuna was not briefed on matters relating to the Upper Rock Nature Reserve by his superiors prior, nor indeed after his appointment. Mr Fortuna does, however, have a sound knowledge of the 'Nature Protection Ordinance, 1991' and all legal notices related to this, and his working relationship with GONHS is a very good one.

Despite covering about 40% of Gibraltar's surface, the Upper Rock is not policed regularly. There is an occasional presence in the form of the odd patrol car or motorcycle, but personal observations during traffic surveys have shown that these are few and far between. Furthermore, Royal Gibraltar Police patrols during the nighttime are practically non-existent, and only occur if the police are following up on a report. Most patrols are mobilised to apprehend spotters related to drug and tobacco smuggling. Apart from their practices, these spotters are also in breach of the law in that they remain within the Nature Reserve after sunset (which goes against section 3.(3), pp.114 of L/N 51 of 1993) and that they frequently deposit large amounts of litter (which breaches section 8.(a), pp.117 of L/N 51 of 1993, as well as other more general laws on litter). However, the police do not generally address the matter relating to litter, even when these individuals have been apprehended.

It was highlighted to PC Fortuna that people not only remain within the Nature Reserve after the entrance at Engineer Road has been shut, but also regularly enter after sunset. It is of grave concern that the Upper Rock is not patrolled after the gates have shut in order to ask those who remain inside to leave, but it is even more worrying that people are rarely challenged when entering the Nature Reserve via Moorish Castle after sunset, where the barrier almost always remains open. The management of the Upper Rock Nature Reserve contracts the security guards at the gate, and they are responsible for ensuring that the Upper Rock remains secure throughout the night. However, it is also, or even primarily the police's job to enforce the law where this is being breached, as is clearly the case here.

The Royal Gibraltar Police regularly seeks cooperation with the Gibraltar Services Police on matters related to criminal offences and drug and tobacco smuggling taking place within the Nature Reserve. The Services Police did in fact voluntarily clean Douglas' Path a few years back, and placed a barrier at the southern entrance to the path in order to prevent spotters from entering with their mopeds. Unfortunately, however, the barrier was dismantled by spotters, after which the area fell back into a dilapidated state.

With regard to Barbary macaques, the police have only received reports when the macaques have posed a nuisance in residential areas outside the Nature Reserve, whence the management of the macaques has been informed. With regard to feeding, the police rely on persons coming forward to give a statement of the infraction committed and act as witnesses in the follow up. It was pointed out by us that this would prove futile, as by the time the authorities arrived at the scene of the infraction the culprit would be long gone.

3.19 Recommendations

1) The Wildlife Liaison Officer should have a role policing the Upper Rock Nature Reserve. Wildlife Wardens should be appointed, and these should liaise closely with the WLO. The wardens would alleviate the WLO's responsibility, and he would then have time to address matters outside the Nature Reserve, both within and outside of his role as WLO.

2) A greater effort should be made by the Royal Gibraltar Police to ensure that no persons remain within the Upper Rock after sunset, and that the barriers at Moorish Castle are closed to all except for resident and other with permission to enter the Nature Reserve at night.



large psammodromus

Julien Martinez / GONHS

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4. European Wildlife Directives and the Convention on Biodiversity

4. European Wildlife Directives and the Convention on Biodiversity

4.1 Natura 2000

The Natura 2000 Network is a network of protected areas set up under European COUNCIL DIRECTIVE 79/409/EEC on the conservation of wild birds and COUNCIL DIRECTIVE 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. These require action by Member States in the setting up of procedures that will enable the establishment of a Europe wide network of protected areas that will guarantee the survival of threatened plants, animals and habitats. The COUNCIL DIRECTIVE 92/43/EEC of May 1992, also known as the Habitats Directive, complements the requirements of the earlier EC Birds Directive which refers specifically to the protection of birds.

The Gibraltar Ornithological and Natural History Society contributed to the preparation of the main text of the Habitats Directive both directly and through its UK representatives in the Overseas Territories Conservation Forum of NGO's, and its contacts in UK with environmental bodies, namely the Royal Society for the Protection of Birds RSPB and Worldwide Fund for Nature (WWF-UK). The Directive was transposed into the laws of Gibraltar on 25th August 1995 (Nature Protection Ordinance, 1991, (Amendment) Regulations 1995; L/N 118 of 1995) by the then Minister for the Environment, the Hon. Joe Pilcher.

The 'Nature Protection Ordinance, 1991' (L/N 11 of 1991) already fulfils most of the obligations of the Directive, but the Directive requires the protection of particular habitats of importance, known as Special Areas of Conservation (SAC's), and/or species of importance and envisages the provision of funding towards these aims. In this respect, GONHS feels that the Upper Rock Nature Reserve meets the requirements of the Directive in holding particular species of global and national importance that should be considered by the Commission to be Sites of Community Importance (SCI's).

4.2 The Habitats Directive

The Bern Convention on the Conservation of European Wildlife and Natural Habitats ratified by the United Kingdom in 1982 is also of relevance in this context.

Its principal aims are:

- to ensure conservation and protection of all wild plants and animal species;
- to increase co-operation between States in these areas; and
- to afford special protection to the most vulnerable of threatened species (including migratory species).

The Convention thus protects over 500 wild plants species and more than 1000 wild animal species. It is open – that is, not limited to Europe – and is now in force in 45 member states. This convention was the inspiration for the 'EC Habitats and Wild Birds Directives' and had a direct influence on the UK's main conservation legislation, the Wildlife and Countryside Act 1981 (as amended).

The Habitats Directive, also known as 'The European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC 1992', identifies habitats and species of special interest within the European Community, and legislates for the notification of Special Areas of Conservation (SACs). The Directive (92/43/EEC) requires Member States to designate certain sites as SACs. From these national lists, Member States and the Commission will agree the Sites of Community Importance, which will become designated SACs. The UK forwarded 331 sites to Brussels as Sites of Community Importance or Candidate Special Areas of Conservation (cSACs). Together with Special Protection Areas classified under the Council Directive on the Conservation of Wild Birds (79/409/EEC), SACs will constitute the European Union's Natura 2000 network.

The Habitats Directive was transposed into Gibraltar law on 25th August 1995 (Nature Protection Ordinance 1991 (Amendment) Regulations 1995) as its obligation as part of the member state. A number of aspects have yet to be applied and several factors affecting this Directive have to be addressed by Gibraltar. This information, which was compiled by GONHS and presented to the Gibraltar Government, is being submitted by the Gibraltar Government to the Commission through the Minister of State for the Environment. A list of all requirements and factors affecting Gibraltar that affect the implementation of the Directive, can be seen below.

4.3 The Gibraltar Habitats Directive Report

The situation at present.

Abbreviations

GONHS	The Gibraltar Ornithological & Natural History Society
GOG	Government of Gibraltar
MOD	Ministry of Defence
JNCC	Joint Nature Conservation Committee
SPA	Special Protection Areas
SAC	Special Area of Conservation
CSAC	Candidate Special Area of Conservation
SCI	Sites of Community Importance
IBA	Important Bird Areas

Comments requested below:

Legal/institutional framework

i) Directive 92/43/EEC was transposed into the laws of Gibraltar on 25th August 1995 by Nature Protection Ordinance 1991. (Amendment) Regulations 1995.

An additional appendix was required to include some species, which were not already offered protection by the Nature Protection Ordinance.

No sites have as yet been designated.

Responsibility for implementation lies with the Government of Gibraltar (GOG), although there is Ministry of Defence (MOD) involvement in certain areas.

ii) The environment falls within the competency of the Government of Gibraltar as a defined domestic matter under the Constitution of Gibraltar.

4.3.1 Conservation of natural habitats and habitats of species (Natura 2000 network)

a) *Proposals for Sites of Community Importance*

i) The proposals have been prepared by GONHS using its inventories and databases.

ii) The proposals were submitted by GONHS to GOG. Because the sites include land held for the Crown by the MOD, the latter Ministry was consulted. A number of constraints were placed by MOD, which have held up the designation process to the point that the formal proposal has not yet been made. It was suggested that stricter conditioning of the designation was expected than within the UK. This has been found to be unacceptable in Gibraltar.

iii) MOD subsequently agreed to Government proposals in mid 2004.

iv) The recommended sites, based on the original data forms prepared by GONHS were submitted to the Commission through the Secretary of State.

b) *Protection and management of the Natura 2000 sites.*

i) In view of the fact that the sites have not yet been designated, no such measures have yet been prepared. However, this report on the Upper Rock in itself goes much of the way towards fulfilling the need for management plans for the terrestrial site. It is likely that the work to prepare the management plans for other areas will be done by GONHS, largely as part of its work in preparing a Biodiversity Action Plan, as the Habitats Directive encompasses the Territory of Gibraltar and its Territorial waters.

ii) No formal measures exist. GONHS treats the sites as if they had already been designated and acts as a "watchdog" on steps that might cause deterioration/disturbance, using as a tool the provisions of the Nature Protection Ordinance wherever possible. This is done both informally and through its membership of the Development & Planning Commission. Habitat maintenance and restoration are carried out either as voluntary tasks, or incidentally as a result of other initiatives,

as in the restoration of the vegetation of the Great Sand Slopes (Cortes *et al.* 1999).

iii) No mechanisms are in place for the evaluation and authorisation of new activities affecting the sites.

c) Financing

i) This report is partially fulfilling the need to estimate the cost for Natura 2000 sites. Additional work of this nature is envisaged in the Biodiversity Action Plan being prepared by GONHS.

ii) No funds have yet been sourced, as the sites have not been designated. LIFE applications in 1995 were unsuccessful, partly because of non-designation of sites. Gibraltar has acquired Structural Funds, none of which have as yet been requested for Natura 2000 projects in view of non-designation of sites. However, preparation of this report is funded from this source.

d) Surveillance

i) Because the sites have not yet been designated, there are no tools (databases, methodologies, etc.) as yet set up for surveillance of the conservation status of species and habitats. There is considerable surveillance in some fields (e.g. botany and ornithology), but this is NGO-led. These will need to be formalised in the future following designation.

ii) Surveys and censuses carried out by GONHS are limited due to limited funding.

4.3.2 Protection of species

a) Measures taken for the strict protection of species

i) There is strict legal protection of species under the Nature Protection Ordinance 1991. GONHS projects include captive breeding and release of lesser kestrel *Falco naumanni* and peregrine falcon *Falco peregrinus*.

ii) There is currently no control system for incidental capture and killing.

b) Taking of wild animals

i) Under the Nature Protection Ordinance, the use of poisons, gill and seine nets, mist-nets, rake nets, or the use of other indiscriminate methods of capture are either prohibited or regulated through licensing. Legal prohibition of taking of all species (including reverse-listing of plants).

ii) Derogations are only given in the case of control of the yellow-legged gull *Larus michahellis* and in certain situations culling of Barbary macaques *Macaca sylvanus*.

4.3.3 Other supporting measures and additional provisions

a) Research efforts

i) No specific research programmes are in place, pending formal designation and funding availability. Only NGO (GONHS) led research programmes exist currently not directly linked to the Habitats Directive.

b) Introduction or reintroduction of Annex IV species

i) Reintroduction of endemic *Silene tomentosa* (surprisingly omitted from Annex II but extinct in the wild in 1995) is being carried out by GONHS and Gibraltar Botanic Gardens (GOG funded) with moderate success. Non-native plant species are excluding native species. Notably, *Carpobrotus edulis x acinaciformis* affecting *Limonium emarginatum* in coastal habitats and *Chasmanthe floribunda* excluding several species including *Iris filifolia* in clearings in the matorral.

c) *Education and information*

i) There is increasing incorporation of local conservation issues in school national curriculum, including field visits, etc., and also NGO (GONHS) led work in the press, radio and television.

4.3.4 General questions

The planning process.

i) Planning is co-ordinated through the Development & Planning Commission which includes a representative from GONHS. This usually ensures that conservation of habitats and species is integrated into the formal planning procedures at this level. The Commission is serviced by the Town Planning Section of the Ministry for Trade, Industry and Communications. The Assistant Town planner is currently drafting a new development plan that aims to integrate the requirements of nature conservation (including the provisions of the Habitats Directive). However, these considerations are not integrated at inter-departmental nor Ministerial level.

ii) Very few human resources are directly available within the administration for the implementation of the Directive. Government contracts include personnel from a botanic garden and through contracts with GONHS to manage the macaques and the yellow-legged gulls; some additional basic practical work is carried out, but mainly on a voluntary basis. The Government Environment Department is staffed only by three people, a Senior Officer and two Administrative Officers, with some typing support. This requires reviewing and either the employment of additional staff or the contracting out of further activities.

4.4 Additional notes and comments

The Gibraltar Ornithological & Natural History Society (GONHS) is an NGO dedicated to research into and conservation of nature. It is consulted on environmental matters by both the Government of Gibraltar and of the UK and hold several Government wildlife management contracts in Gibraltar. In the absence of biologists, ecologists or conservationists in the employment of the Government of Gibraltar, the latter uses the expertise within GONHS to provide it with advice on matters relating to the natural environment. Much of this (including all the work on the Habitats Directive and the Nature Protection Ordinance) has been provided on a voluntary (non-fee-paid) basis.

In Gibraltar, the Nature Protection Ordinance of 1991 was the landmark in nature conservation equivalent to the UK Wildlife and Countryside Act. Drafted by GONHS and passed unanimously at the Gibraltar House of Assembly, it also confirmed the close working relationship of GONHS and the Government of Gibraltar, with GONHS still retaining its independent NGO status and sometime being critical of Government.

The Habitats Directive was transposed quite promptly. However, difficulties in ironing out the defence points of view expressed by MOD significantly delayed proper implementation of the Directive in Gibraltar. This was holding up the development of administrative and practical structures in the Territory to provide the necessary information on and protection of the habitats and species.

There has been similar difficulty to that experienced in UK over the occurrence of some of the habitats. Because of Gibraltar's size, some of the areas in question are very small and representation is hard to determine. Concepts such as "percentage of habitat" and "percentage of the national territory" have to be placed in perspective.

As in the UK, site selection has used the best available information, and adapting the definitions contained in the Interpretation Manual of European Union Habitats (EC 1994) to the specialised communities of Gibraltar, some of which have only just been described (Galán de Mera *et al.* 2000). But again, because of the small size of the Territory, the important habitats (including priority habitats) are in most cases very small in extent. Proposing a patchwork of small sites was not practical, nor would it be effective as a conservation measure. Therefore, these sites were linked into a terrestrial site and a marine site (GONHS 1994). Because of the presence of these habitats and of species found within them, and the potential danger posed to all of them by the intimate proximity of human activity, much of the Territory and Territorial waters of Gibraltar have been included in the proposed Natura 2000 sites.

Some endemics, including the plant *Silene tomentosa* and a number of sea slugs, were never included in the Annexes, as the EU did not consult Gibraltar experts during the preparation of the Directive. Gibraltar however treats these species as if they were included in the Directive's Annexes.

It should be noted that although the requirements of the Birds Directive (79/409/EEC) were included in the 'Nature Protection Ordinance, 1991' no SPAs were ever designated, and the proposal under the Natura 2000 system is also seen as covering this requirement for Gibraltar.

Because of the delays in designation of the sites, no financial provision has been made for implementing Natura 2000, nor have possible EU sources of funding been fully explored.

While GONHS has carried out inventories of a great deal of Gibraltar's biological resources, including vascular plants, molluscs, butterflies and moths, reptiles, birds, mammals, and many marine groups, there are significant gaps¹. There are no inventories for terrestrial invertebrates (other than the mollusca and lepidoptera) or in non-vascular plants.

There are several important and specific factors that will have a bearing on the Habitats Directive. These are listed below.

1) The 'Nature Protection Ordinance, 1991', reverse-lists plants, listing only those that may be picked.

2) The Nature Reserve Regulations prohibit uprooting of all species within the Upper Rock Nature Reserve.

3) The Ordinance prohibits the taking of all wild animals except rats and mice and feral cats, dogs and pigeons. All wild amphibians, reptiles, birds and mammals (including cetaceans) are protected against intentional killing.

4) Members of GONHS carry out all monitoring and research on a voluntary basis.

5) The Nature Protection Ordinance allows licensed taking for similar purposes to the UK Wildlife and Countryside Act.

6) The licensing authority is the Governor of Gibraltar, under advice from the Gibraltar Nature Conservancy Council. In practice licences are issued by the Deputy Governor and the advice is channelled through the Minister for the Environment.

7) Licences have been granted for research (e.g. bird ringing), and conservation (e.g. taking plants into the botanic gardens for propagation and re-introduction).

8) Licences have also been granted for the control of the yellow-legged gull, a pest species, and on occasions for the exportation and culling of Barbary macaques to maintain sensible manageable levels. Culling has only been allowed in the case of macaques that have become a nuisance in built-up areas.

Introduction of non-native species is prohibited under the Nature Protection Ordinance. There are problems with introduced plants affecting diversity of native species (e.g., *Chasmanthe floribunda*, *Senecio angulatus* & *Pennisetum clandestinum*; see Chapter 8). Introduced animals also cause problems. For example, feral pigeons displace lesser kestrels *Falco naumanni* from nesting sites, released pet rabbits interbreed with the native form and chickens have been found running freely on the Upper Rock in the Princess Caroline's Battery area, Bruce's Farm area and recently chicken coops has been erected beside the Cable Car top station and at St Michael's Cave where the chickens wander amongst the tourists. There is a danger that these chickens could pass on diseases to the Barbary Partridge. There is, in addition, no doubt that these chickens will compete with the partridges for food.

GONHS is attempting a captive breeding programme of lesser kestrels with a view to setting up a second colony in Gibraltar additional to a long-established but numerically decreasing colony on the North Face of the Rock.

GOG and MOD are funding a project to restore vegetation of stabilised dunes on the east side of Gibraltar following the removal of corrugated iron sheets formerly used to collect rain water.

Human resources involved in Natura 2000 work at present are basically provided by

GONHS, on a part-time (unpaid) basis.

Following acceptance of the sites, more resources will be required and further documents, including management plans and a biodiversity action plan, will have to be prepared. This will complement the Upper Rock Nature Reserve management plan.

The Annex I habitats and Annex II species occurring in Gibraltar are listed at the end of the chapter.

4.5 The Natura 2000 network

4.5.1 Species

Annex II of the Natura 2000 Directive lists 'Animal and Plant species of community interest whose conservation requires the designation of special areas of conservation; SAC's'. These include three bat species, namely the lesser horseshoe bat *Rhinolophus hipposideros* (passage/accidental), and two resident species, the Schreiber's bat *Miniopterus schreibersii*, and the greater mouse-eared bat *Myotis myotis*. The resident species make use of the many caves and tunnels in Gibraltar to breed and roost, but have declined in recent years (A. Santana, *pers. comm.*). Their caves and feeding habitats require designation as Special Areas of Conservation (SAC's). Other species whose world status is as precarious as some listed in this Annex have been excluded from the directive, as there was no consultation on the appendices which led to several rare species with their only European location in Gibraltar being omitted. These include the endemic Gibraltar campion *Silene tomentosa*, thought extinct until 1994 (Cortés & Linares 1993). Species in Annex IV of relevance to the Nature Reserve, of community interest and in need of strict protection that are covered by the Nature Protection Ordinance include all bats, the horseshoe whip-snake *Coluber hippocrepis*, and the Gibraltar funnel-web spider *Macrothele calpeiana*.

There are species that occur in Gibraltar which need protection because they are of local interest, even if not included in the Directive, (see Table 1). Of particular importance are those species, sub-species or varieties that occur only in Gibraltar. These may have been excluded from the Directive due to lack of knowledge of Gibraltar's natural history on the part of those drawing up legislation in London or Brussels, or due to the fact that they are not recognized as separate species, but are considered as sub-species. This does not make them any less important in conservation terms. This importance is afforded to them in the 'Nature Protection Ordinance, 1991'.

Table 1. Species and subspecies of particular importance to Gibraltar, but excluded from the Directives.

Group	Species	Population	Motivation
Plants	<i>Silene tomentosa</i>	1	A,B
Plants	<i>Ononis natrix var. ramosissima</i>	251-500	A,B
Plants	<i>Saxifraga globulifera</i>	101-250	A,D
Plants	<i>Thymus wildenowii</i>	101-250	A,D
Plants	<i>Iberis gibraltaria</i>	1001-10000	A,D
Plants	<i>Limonium emarginatum</i>	1001-10000	A,D
Plants	<i>Cerastium gibraltarium</i>	251-500	A,D
Mammals	<i>Macaca sylvanus</i>	101-250	D
Reptiles	<i>Hemidactylus turcicus</i>	V	A
Invertebrates	<i>Cecilioides spp.</i>	R	B
Invertebrates	<i>Zygaena fausta gibraltaria</i>	C	A

Population: C=common, R=rare, V=very rare

Motivation: A = National Red Data List, B = Endemics, C = International Conventions (incl. Bern, Bonn and Biodiversity), D = Other reasons

 Species not found on the Upper Rock Nature Reserve

4.5.2 Sites

Annex I of the Habitats Directive defines the natural habitat types of community interest whose conservation requires the designation of Special Areas of Conservation (SAC's). Sites within Gibraltar that fall into these categories have been considered in accordance with the criteria set out in Annex III of the Directive. This is in order to assess the national level of relative importance for each natural habitat where 'national' refers in this context to the Territory of Gibraltar and its Territorial waters. Although the Member State is the United Kingdom, Gibraltar and the UK are found within different biomes. Therefore Gibraltar represents, in virtually all the cases, 100% of the habitat type or species in question, even if Gibraltar and the UK were taken together.

The habitat types described next are taken from the document prepared by GONHS entitled 'The Habitats Directive and Gibraltar' (1994).

4.5.3 Natural Habitat Types of Community Interest whose Conservation Requires the Designation of Special Areas of Conservation

Vegetated sea cliffs of the Mediterranean coasts (with endemic *Limonium spp*)

Location:

Sea cliffs from Sandy Bay to Europa Point and Rosia Bay. This includes the sea cliffs, which rise up to Martins Cave around Mediterranean Step's where *Limonium emarginatum*, Gibraltar sea lavender can also be found growing.

a) Degree of representativity of the natural habitat type on the site.

Representative of Mediterranean limestone sea cliff with perennial plant community including *Aeonium korneliuslemsii* and *Limonium emarginatum*, endemic to the Strait of Gibraltar.

b) Area of site covered by habitat in relation to the habitat in Gibraltar.
50%

c) Degree of conservation.

Poor to very good. Areas have accumulated rubbish and rubble, and others have been polluted by effluent from the refuse incinerator. The area within the Nature Reserve is unspoiled due to its inaccessibility and remoteness.

d) Global assessment.

The occurrence of an endemic makes this an area of global importance. It is also unique in landscape value together with the rest of the Mediterranean Steps.

Mediterranean Arborescent Matorral

Matorral with *Laurus nobilis*

Location:

The western slopes of the Rock of Gibraltar, within the Upper Rock Nature Reserve, especially the south-western and extreme north-eastern slopes.

a) Degree of representation of the natural habitat type on the site.

Representative of Mediterranean matorral, dominated by *Olea europea*, wild olive, *Osyris quadripartita*, *Rhamnus alaternus*, Mediterranean buckthorn and *Pistacia lentiscus*, lentisc with individual *Laurus nobilis*, sweet laurel and *Celtis australis*, nettle tree scattered within them, being most common in the stated areas.

b) Area of site covered by habitat in relation to the habitat in Gibraltar.
100%

c) Degree of conservation.

Fair. Existing trees and shrubs must be protected.

d) Global assessment.

Small areas of laurel-containing matorral, but such habitats are rare. The Upper Rock is important under the Birds Directive. *Macrothele calpeiana*, Gibraltar funnel-web spider and *Coluber hippocrepis*, horseshoe whip-snake occur in this habitat.

Thermo-mediterranean and Pre-Steppe Brush

All types

Location:

Parts of the western slopes of the Rock of Gibraltar, within the Upper Rock Nature Reserve, especially the area known as Rock Gun.

a) Degree of representation of the natural habitat type on the site.

Representative of pseudosteppe and garrigue. Nesting site for *Alectoris barbara*, Barbary partridge and an important stopover site for migrant passerines. Also a foraging site for *Macaca sylvanus*, Barbary macaque.

- b) Area of site covered by habitat in relation to the habitat in Gibraltar.
100%
- c) Degree of conservation
Good in the area although beginning to regenerate into arborscent matorral.
- d) Global assessment.
Representative of limestone-based pseudosteppe and garrigue vegetation, together with importance for migratory birds.

Mediterranean Sclerophyllous Forests

Olea and *Ceratonia* forests

Location:

The western slopes of the Rock of Gibraltar, within the Upper Rock Nature Reserve.

- a) Degree of representation of the natural habitat type on the site.
The Upper Rock was historically covered by *Olea* and *Ceratonia* forest, which was removed during the 18th Century (Cortes 1994). *Olea* is now the dominant species of the scrub, and in areas has developed into woodland (Cortes 1979, 1994). *Ceratonia siliqua*, carob tree is re-establishing itself more slowly.
- b) Area of site covered by habitat in relation to the habitat in Gibraltar.
100%
- c) Degree of conservation.
Unspoilt in areas where woodland has already become re-established. The particular interest of the site is enhanced by the fact that it allows the study of recovery of an area of *Olea* and *Ceratonia* woodland.
- d) Global assessment.
The importance of this area is the natural recovery of the woodland that is taking place in what is already a protected area. *Macrothele calpeiana* and *Coluber hippocrepis* occur in this habitat.

Chasmophytic Vegetation on Rocky Slopes

Calcareous sub-types

Location:

Northern and eastern cliffs of the Rock of Gibraltar, and the outcrops of the cliffs on the western side of the Rock.

- a) Degree of representation of the natural habitat type on the site.
Extensive areas of mostly unspoilt chasmophytic vegetation representative of the habitat. Plant species of particular interest include *Saxifraga globulifera gibraltarica*, Gibraltar saxifrage, *Cerastium gibraltaricum*, Gibraltar chickweed, *Thymus wildenowii*, Gibraltar thyme, *Helichrysum rupestre*, wall helichrysum and *Iberis gibraltarica*, Gibraltar candytuft. The endemic species *Silene tomentosa*, Gibraltar campion, until recently presumed extinct (Cortés & Linares 1993) has been rediscovered in this habitat where the known world population is of two plants.
- b) Area of site covered by habitat in relation to the habitat in Gibraltar.
60%
- c) Degree of conservation.
Very good. Some sites more accessible and close to human habitation require monitoring.
- d) Global assessment.
The chasmophytic vegetation of the Rock of Gibraltar is representative of areas of limestone in the Mediterranean, but has added global importance in the occurrence within it of taxa which are either endemic or with affinities to North Africa.

Other Rocky Habitats

Caves not opened to the public.

Location:

Scattered throughout Gibraltar.

a) Degree of representation of the natural habitat type on the site.

Largely unspoiled caves in limestone, some being roosts and breeding caves for *Miniopterus schreibersii*, Schreiber's bat, *Tadarida teniotis*, European free-tailed bat and possibly *Myotis myotis*, mouse-eared bat.

b) Area of site covered by habitat in relation to the habitat in Gibraltar.

40%

c) Degree of conservation.

Fair to excellent. Some caves contain debris and rubbish and need to be cleaned and closed, leaving access to bats. Bat numbers have declined drastically of late and all bat roosts and potential roosts need protection.

d) Global assessment.

All populations of bat species found in Gibraltar are globally important.

4.5.4 Conclusions

Within the areas considered to be Sites of Community Importance (SCI's) and requiring listing as Special Areas of Conservation (SAC's) six are found within the Upper Rock Nature Reserve, with their locations indicated in Fig. 1. These areas should have been considered by the Commission of the European Community as Gibraltar's recommendations under the Directive, which were published in a report prepared by the Gibraltar Ornithological and Natural History Society (1994), and have only just been submitted to the Commission through the Secretary of State for the Environment by the Gibraltar Government.

The Gibraltar Nature Protection Ordinance (1991) already allows for the designation of nature conservation areas. Amendments to the Nature Protection Ordinance will need to take place to accommodate the Directive requirements once the areas in question are designated their corresponding status.

A list of the percentage coverage of the habitat sites in question that were submitted can be found in Table 2. Although this document deals specifically with the Upper Rock, the whole environment of Gibraltar can not be excluded as all these areas have a particular influence and bearing on the broader picture.

Table 2. List and percentage cover of Habitat Classes found in Gibraltar.

Habitat Classes	% Cover
<i>Shingle, Sea cliffs, Islets</i>	22
<i>Heath, Scrub, Maquis and Garrigue, Phrygana</i>	60
<i>Dry grassland, Steppes</i>	8
<i>Broad-leaved evergreen woodland</i>	3
<i>Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)</i>	2
<i>Inland rocks, Scree, Sands, Permanent snow and Ice</i>	5
Total Habitat Cover	100%

Other site characteristics: Site includes *Olea*-dominated maquis and clearings on the west side with some woodland with *Olea* and *Pinus* and scattered *Larus nobilis*. Garrigue.

Tall sea cliffs on North and East with smaller cliffs on West and South. Caves and tunnels present.

Underlying rock is mainly Jurassic Limestone.

4.5.5 Funding

Designation is, however, not enough, and proper enforcement of nature conservation is required. This includes the prevention of deterioration of habitats, which is a significant problem in Gibraltar at the moment. The Habitats Directive includes provision for co-financing of work to uphold its requirements. Apart from the specific requirements of the habitats, there is a need to strengthen research, monitoring and database consolidation. An estimate (as at end 2003), of what it would cost in the ideal situation to carry out all direct and supporting work in the habitats found within the Upper Rock Nature Reserve is given in table 3. Savings

in recurrent expenditure could be made if overall supervision and a management team were provided, as recommended in Chapters 23 & 24, rather than relying on separate action in each habitat type.

Table 3. Summary of cost of financing Habitats Directive requirements in Gibraltar. This table, including costs, has been amended to incorporate management recommendations (see Chapter 24, Action 15.2).

Habitat	Action	Cost
Vegetated Sea Cliffs	Initial costs (non-recurring)	
	Habitat/site restoration	£100,000.00
	Clearing of rubbish	£20,000.00
	Recurrent expenditure (p.a.)	
	Habitat management	£30,000.00
	Site supervision	£15,000.00
Matorral with Laurus	Initial cost (non-recurring)	
	Habitat/site restoration	£100,000.00
	Clearing of rubbish/debris	£30,000.00
	Recurrent expenditure (p.a.)	
	Habitat management	£40,000.00
	Site supervision	£35,000.00
Thermo-mediterranean and Presteppe Brush	Initial cost (non-recurring)	
	Habitat/site restoration, Rock Gun area	£100,000.00
	Recurrent expenditure (p.a.)	
	Habitat management	£30,000.00
	Site supervision	£30,000.00
Chasmophytic vegetation	Initial cost (non-recurring)	
	Surveying of site and remedial action	£30,000.00
	Recurrent expenditure (p.a.)	
	Habitat management	£20,000.00
	Site supervision	£20,000.00
Caves	Initial cost (non-recurring)	
	Habitat/site restoration	£20,000.00
	Protection of caves	£10,000.00
	Recurrent expenditure (p.a.)	
	Monitoring/Supervision/Conservation	£25,000.00
Total	Capital	Recurrent
Annual	£440,000.00	£245,000.00
Over 3 yrs	£440,000.00	£735,000.00
Grand Total over three years		£1,175,000.00

4.6 EUROBAT

EUROBAT was set up as part of the Bonn Convention, also known as 'The Convention on the Conservation of Migratory Species of Wild Animals' and specifically under 'The Agreement on the Conservation of Bats in Europe (1994)'. This agreement recognises that endangered migratory-species can only be properly protected if activities are carried out over the entire migratory range of the species. To date, twenty-six European range states, from North, South, East and West, are signatories to this Agreement. The aims of the Bat Agreement are to protect all 37 species of bats identified in Europe, through legislation, education, conservation measures and international co-operation with Agreement members and with those who have not yet joined. This is one of the Multilateral Environment Agreements that applies to Gibraltar, and to which the United Kingdom is a signatory, as the member state, (see section 4.51).

4.7 The Biodiversity Convention

The European Community is a party to the Convention on Biological Diversity, better known as the 'Biodiversity Convention'. The United Kingdom Prime Minister signed this convention at the 'Earth Summit' in Rio de Janeiro in June 1992, and as a result the concept of a Global Biodiversity Forum was set up. Therefore, as part of the member state, Gibraltar has accepted the commitment to apply the convention in its territory.

Biodiversity is a portmanteau term that means 'biological diversity'. It is essentially the variation and variety of all life on earth, composed of millions of organisms of plants, animals and micro-organisms that inhabit the planet. The genes they contain and the intricate communities these species comprise is in effect what we commonly know as Nature; the product of four billion years of evolution (DDP Services 1995).

The aims of the Biodiversity Convention are to conserve biodiversity, to use it sustainably, and to ensure fair and equitable distribution of benefits resulting from the exploitation of genetic resources.

In January 1994 the Prime Minister launched 'Biodiversity': The UK Action Plan, where he announced that a Biodiversity Steering Group would be established, with representatives drawn from key sectors and chaired by the Department of the Environment which would oversee the following tasks: -

- Developing costed targets for key species and habitats;
- Suggesting ways of improving the accessibility and co-ordination of information on biodiversity;
- Recommending ways of increasing public awareness and involvement in conserving biodiversity;
- Recommending ways of ensuring that commitments in the plan were properly carried out;
- Publishing findings before the end of 1995

The United Kingdom, as the member state in the European Union with responsibility for Gibraltar, published these findings in their 'Biodiversity: The UK Steering Group Report' Volumes I and II', HMSO (1995), where they referred to Gibraltar in 'Annex B' under the 'Dependent Territories Progress Report'

In this report, Gibraltar figures as ecologically significant and sensitive, stemming from its location on a major migration route, with very substantial flora for its area and important marine biological assets, but vulnerable because of its small area with a high population. They have recognised the sound, scientifically based work that has been carried out over a number of years and welcome the implementation of the 'Nature Protection Ordinance, 1991' and the creation of the Upper Rock Nature Reserve together with transposition of EU Directives. They also state that Gibraltar has implemented the Habitats Directive, which unfortunately is *not* fully the case, as a number of actions are still waiting to occur. What has happened is that the Habitats Directive has been transposed into the laws of Gibraltar under the heading of 'Implementation of the Habitats Directive', without any sites actually being designated as yet.

The report recognizes the excellent human resources backing the conservation efforts in the form of the Gibraltar Ornithological & Natural History Society and the partnership that exists between this organization and the Gibraltar Government, providing expert advice and preparing reports. It also mentions that Gibraltar is considered as a location for one of the global Geographical Observatories under a programme initiated by the Royal Geographical Society, and refers to the main problem Gibraltar faces, which is lack of funds dedicated to biodiversity conservation.

Finally the European Union, in its European Biodiversity Strategy (2003), is committed to halt all declines in biodiversity by 2010.

The implementation of the Convention takes into consideration policy decisions across a wide range of economic activities, including agriculture, fisheries, forestry and transport. Most of these sectors do not apply to Gibraltar itself but some, as in the case of fisheries, have wide political implications. Although there is no large scale commercial fishing activity, the fish stocks in Gibraltar's territorial waters were allowed, under a "fishing agreement" negotiated by the Chief Minister, to be exploited by a member state, even though as pointed out by GONHS, these stocks were unsustainable, and that in so doing the Spanish fishermen were contravening the 'Nature Protection Ordinance, 1991'.

The implementation of the Biodiversity Convention and all other environmental directives requires, primarily political will and secondly, the establishment of a fund raising mechanism; whether through direct Governmental funding or accessing Community funds such as LIFE or Structural Funds. The benefits to Gibraltar are potentially great, yet failure through the years to successfully access such funds, for a variety of reasons, has seen the environment suffer and this is reflected in the dilapidated state of the Upper Rock Nature Reserve. It is hoped that the current initiative under which this report is being prepared, will result in improvements in this area.

There are two aspects of the Biodiversity Convention that relate directly to the Upper Rock Nature Reserve. The first deals with energy and transport in which the European Community has developed a wide range of initiatives to deal with these problems. The Community is committed to achieving an 8% reduction on 1990 levels of emissions of six greenhouse gases by 2010, and on transport a package of measures addresses road transport emissions. The commitment by M. H. Bland Ltd to substitute diesel fuel to 'Biodiesel' in their fleet of tour buses is the first step in achieving these aims, and also one of the objectives of the management plan for the Upper Rock Nature Reserve.

The other aspect that is directly relevant but has been neglected as a potential source of Community funding is tourism. Tourism activities within the European Community have in the past often been concentrated in zones that may be the subject of intense seasonal influxes of visitors. Gibraltar is a zone that has seen a spectacular rise in the number of visitors over the last fifteen years. From 782,630 visitors in 1993 to a staggering 7,608,461 in 2002, (Statistics Office 2002). Sustainable development of the tourism sector depends on maintaining a high-quality natural and man-made environment. A number of initiatives have been developed in the European Community that aim to integrate environmental protection and tourism. With this in mind, a large part of the budget under the Community's action plan to assist tourism is earmarked for sustainable tourism projects, and the Community's Structural Funds have been applied to many projects that combine tourism activities with biodiversity conservation. Although the Biodiversity Convention has been adopted in Gibraltar as part of the member state, its recommendations have unfortunately not been implemented, and therefore sources of funding, such as Leader II (1994-1999), Gibraltar could have applied for, and would have ultimately benefited sustainable tourism programmes within the Upper Rock Nature Reserve, have not been tapped. Notwithstanding this, other sources of funding, essentially Structural Funds, have been used. For example, the road widening that took place at Cave Branch Road on the Upper Rock Nature Reserve and the preparation of this report benefited from European funding.

An example of the way these funds have been accessed by other member states can be seen in Portugal (EC 1998), where the Envireg fund, a part of the Structural Fund, has been used to co-finance integrated protection schemes to manage areas of scenic interest for tourism and promote rural tourism as part of the Community initiative of the Leader II (1994-1999) funds.

To quote from the report on the implementation of the Biodiversity Convention, (1998), "*Achieving the Community's biodiversity goals is only possible if the legal framework is properly implemented. Unless Community law is properly complied with and effectively enforced in all Member States, the Community's biodiversity strategy cannot be effective*".

We are fortunate that through the work of GONHS our legal framework is in place through the 'Nature Protection Ordinance, 1991'. The implementation of the same lets us down (see Chapter 2); there is practically no enforcement of these laws and without this, the implementation of these Directives will not achieve the goals and expectations. In Gibraltar, all environmental European Directives transposed by the United Kingdom as the member state and accepted and adopted by Gibraltar *should* be implemented. The Gibraltar Government has just recently reported back to the European Commission with the information that was prepared by GONHS *gratis*, as regards Natura 2000, the Birds and Habitats Directive. Acceptance by the Commission, which is expected, should now accelerate the implementation, with the designation of special areas of conservation (SACs), special protection areas (SPAs) and other recommendations listed within these Directives. It should also open up the possibility of accessing Community funds from the Structural Fund, Cohesion Fund and the revised LIFE Funds to establish the various programmes required for the implementation of the Directives, before we miss the boat altogether.

Ironically, the designation of the 'Marine Reserve' encompassing all Gibraltar's territorial waters and included in the 'Nature Protection Ordinance, 1991' and the Marine Reserve Regulations 1996, is also not being enforced, partly due to the Spanish Fishing conflict of 1997/98. At a time when Spanish politicians have designated their own marine reserve on

the other side of the Bay ('Párque Natural del Estrecho' in 2003), and are demanding that Gibraltar implement all environmental European Directives, especially those dealing with maritime and marine connections, Gibraltar should comply with European measures. We should apply our own existing marine legislation to protect our waters from the continuous onslaught of Spanish commercial and sports fishermen and divers, who are prevented from carrying out their activities within their own waters by the establishment of reserves. Although this has no direct bearing to the Upper Rock Nature Reserve, it primarily serves to highlight the problems that exist in enforcing environmental legislation.

Not long ago, Gibraltar was the benchmark in the region for environmental affairs. The GONHS was the template for some of the ornithological, environmental and botanical organisations, not only in the Cadiz province but also in other parts of Spain. The Society was frequently visited and consulted on many aspects of the environment and natural history, but many things have changed in the last decade. The tables have turned. Spanish politicians have become experts in European Community affairs and accessing Community funding. This has had a tremendous impact, especially in the environmental field where they have spent vast sums of money, much of it from European Community sources. Much of the funding has also come from the central and particularly the regional Government, the Junta de Andalucía, which now have strong and firm environmental policies, and a belief that improving the environmental product gets reflected in the general state of the region. Their environmental infrastructure is now very impressive, and the authors have witnessed this in the regional offices of the 'Delegación Provincial de Medio Ambiente' in Cádiz. They have established a network of reserves (see Chapter 19) all around the country and have created employment in the environmental field, including a special environmental police, the SEPRONA, 'Servicio de Protección de la Naturaleza'.

So where does this leave Gibraltar? Unfortunately, we now find ourselves very far behind. Obviously, we cannot expect to compare or compete on the environmental field with a large country. However, it must be said that we have fallen behind largely due to a lack of commitment on the part of the authorities, and we are now paying the consequences of this lack of investment of resources. Over ten years ago Gibraltar did manage to achieve some results through the designations of the 'Nature Protection Ordinance, 1991', and the Upper Rock Nature Reserve. Since then there have been recent definite moves to implement the Habitats Directive, this report was commissioned, and other steps, such as wider consultation, GONHS representation in the planning process and being otherwise consulted have also been welcomed. But this has to be followed with tangible results, consistent with the international instruments outlined in this chapter, including of course a facelift to the Upper Rock Nature Reserve.

Table 4. Birds listed on Annex 1 of Council Directive 79/409/EEC that are found on the Upper Rock.

Code	Name	Population			Site Assessment			Global
		Resident	Migratory		Population	Conservation	Isolation	
			Breed	Winter					Stage
A079	<i>Aegypius monachus</i>			1-5i	A	A	C	
A111	<i>Alectoris barbara</i>	50p			A	B	A	A
A225	<i>Anthus campestris</i>			11-50i	A	B	C	
A243	<i>Calandrella brachydactyla</i>			1-5i	A	A	C	C
A224	<i>Caprimulgus europaeus</i>			6-10i	A	A	C	
A031	<i>Ciconia ciconia</i>			251-500i	A	A	C	
A030	<i>Ciconia nigra</i>			11-50i	A	A	C	
A080	<i>Circaetus gallicus</i>			251-500i	A	A	C	
A081	<i>Circus aeruginosus</i>			101-250i	A	A	C	
A082	<i>Circus cyaneus</i>			1-5i	A	A	C	
A084	<i>Circus pygargus</i>			101-250i	A	A	C	
A379	<i>Emberiza hortulana</i>			11-50i	A	B	C	
A098	<i>Falco columbarius</i>			1-5i	A	A	C	
A110	<i>Falco eleonorae</i>			6-10i	A	A	C	
A095	<i>Falco naumanii</i>		6-10p	11-50i	A	C	C	C
A103	<i>Falco peregrinus</i>	4-5p			A	A	C	B
A096	<i>Falco tinnunculus</i>	5p		51-100i	A	A	C	C

CONTINUE >>

Code	Name	Population			Site Assessment			
		Resident	Migratory		Population	Conservation	Isolation	Global
			Breed	Winter					Stage
A078	<i>Gyps fulvus</i>			51-100i	A	A	C	
A093	<i>Hieraaetus fasciatus</i>			1-5i	A	A	C	
A092	<i>Hieraaetus pennatus</i>		1-5i	251-500i	A	A	C	
A246	<i>Lullula arborea</i>			1-5i	A	A	C	
A272	<i>Luscinia svecica</i>			1-5i	A	A	C	
A073	<i>Milvus migrans</i>			>10000i	A	A	C	
A077	<i>Neophron percnopterus</i>			51-100i	A	A	C	
A094	<i>Pandion haliaetus</i>			11-50i	A	A	C	
A072	<i>Pernis apivorus</i>			>10000i	A	A	C	
A302	<i>Sylvia undata</i>		11-50i	11-50i	A	B	C	

i = individuals; p = pairs.

Population: A: 100% > = p>15%. B: 15%> = p>2%. C: 2% = p>0%.

Conservation: A: Conservation excellent. B: Good conservation. C: average or reduced conservation.

Isolation: A: Population almost isolated. B: Population not isolated, but on margins of area of distribution.

C: Population not isolated within extended distribution range.

Table 5. Regularly occurring migrant birds not listed on Annex 1 of the Council Directive 79/409/EEC.

Code	Name	Population			Site Assessment			
		Resident	Migratory		Population	Conservation	Isolation	Global
			Breed	Winter					Stage
A086	<i>Accipiter nisus</i>			101-250i	A	A	C	
A257	<i>Anthus pratensis</i>		51-100i	501-1000i	A	A	C	
A256	<i>Anthus trivialis</i>			50-100i	A	A	C	
A226	<i>Apus apus</i>	2000p		>10000i	B	A	C	
A228	<i>Apus melba</i>	25p		251-500i	A	A	C	
A227	<i>Apus pallidus</i>	2000p		1001-10000i	B	A	C	
A087	<i>Buteo buteo</i>		1-5i	251-500i	A	A	C	
A431	<i>Calandrella rufescens</i>			11-50i	A	A	C	
A225	<i>Caprimulgus ruficollis</i>			6-10i	A	A	C	
A366	<i>Carduelis cannabina</i>		11-50i	1001-10000i	A	A	C	
A364	<i>Carduelis carduelis</i>		51-100i	1001-10000i	A	A	C	
A363	<i>Carduelis chloris</i>	15p	51-100i	1001-10000i	A	A	C	
A365	<i>Carduelis spinus</i>		11-50i	251-500i	A	A	C	
A268	<i>Cercotrichias galactotes</i>			1-5i	A	A	C	
A335	<i>Certhia brachydactyla</i>			6-10i	A	A	C	
A289	<i>Cisticola juncidis</i>	1-5p	11-50i	101-250i	A	A	C	
A113	<i>Coturnix coturnix</i>			11-50i	A	A	C	
A212	<i>Cuculus canorus</i>			6-10i	A	A	C	
A253	<i>Delichon urbica</i>	6-10p		1001-10000i	A	A	C	
A269	<i>Erithacus rubecula</i>	1-5p	251-500i	1001-10000i	B	A	C	
A099	<i>Falco subbuteo</i>			11-50i	A	A	C	
A322	<i>Ficedula hypoleuca</i>			251-500i	A	A	C	
A359	<i>Fringilla coelebs</i>	1-5p	101-250i	1001-10000i	B	A	C	
A438	<i>Hippolais pallida</i>			1-5i	A	A	C	
A300	<i>Hippolais polyglotta</i>			1001-10000i	A	A	C	
A252	<i>Hirundo daurica</i>			51-100i	A	A	C	
A251	<i>Hirundo rustica</i>			1001-10000i	A	A	C	
A233	<i>Jynx torquilla</i>		1-5i	51-100i	A	A	C	
A340	<i>Lanius excubitor</i>			1-5i	A	A	C	
A341	<i>Lanius senator</i>			101-250i	A	B	C	
A290	<i>Locustella naevia</i>			11-50i	A	A	C	

CONTINUE >>

Code	Name	Population			Site Assessment			Global
		Resident	Migratory		Population	Conservation	Isolation	
			Breed	Winter					Stage
A290	<i>Locustella naevia</i>			11-50i	A	A	C	
A271	<i>Luscinia megarhynchos</i>			1001-10000i	A	A	C	
A230	<i>Merops apiaster</i>			1001-10000i	A	A	C	
A383	<i>Miliaria calandra</i>		1-5i	51-100i	A	B	C	
A280	<i>Monticola saxatilis</i>			1-5i	A	A	C	
A281	<i>Monticola solitarius</i>	30p		P	A	A	C	
A262	<i>Motacilla alba</i>		101-250i	501-1000i	B	A	C	
A261	<i>Motacilla cinerea</i>		11-50i	501-1000i	B	A	C	
A260	<i>Motacilla flava</i>			501-1000i	A	A	C	
A319	<i>Muscicapa striata</i>			501-1000i	A	A	C	
A278	<i>Oenanthe hispanica</i>			251-500i	A	B	C	
A277	<i>Oenanthe oenanthe</i>			251-500i	A	B	C	
A337	<i>Oriolus oriolus</i>			11-50i	A	A	C	
A214	<i>Otus scops</i>			6-10i	B	B	C	
A273	<i>Phoenicurus ochrurus</i>		501-100i	1001-10000i	A	A	C	B
A313	<i>Phylloscopus bonelli</i>			1001-10000i	A	A	C	
A315	<i>Phylloscopus collybita</i>		501-1000i	1001-10000i	B	A	C	C
A316	<i>Phylloscopus trochilus</i>			1001-10000i	A	A	C	
A267	<i>Prunella collaris</i>			11-50i	A	A	C	
A266	<i>Prunella modularis</i>			11-50i	A	A	C	
A250	<i>Ptyonoprogne ruprestis</i>		251-500i	1001-10000i	A	B	C	B
A318	<i>Regulus ignicapillus</i>			11-50i	A	A	C	
A249	<i>Riparia riparia</i>			51-100i	A	A	C	
A275	<i>Saxicola rubetra</i>			51-100i	A	A	C	
A276	<i>Saxicola torquata</i>		11-50i	101-250i	A	A	C	
A155	<i>Scolopax rusticola</i>		1-5i	1-5i	B	A	C	
A361	<i>Serinus serinus</i>	1-5p		11-50i 251-500i	A	A	C	
A351	<i>Sturnus vulgaris</i>		1001-10000i	P	A	A	C	
A311	<i>Sylvia atricapilla</i>	251-500p	501-1000i	1001-10000i	B	A	B	C
A310	<i>Sylvia borin</i>			501-1000i	A	A	C	
A304	<i>Sylvia cantillans</i>			101-250i	A	A	C	
A309	<i>Sylvia communis</i>			101-250i	A	B	C	
A303	<i>Sylvia conspicillata</i>			6-10i	A	A	C	
A306	<i>Sylvia hortensis</i>			51-100i	A	B	C	
A305	<i>Sylvia melanocephala</i>	251-500p		P	A	B	B	C
A286	<i>Turdus iliacus</i>			11-50i	A	B	C	
A283	<i>Turdus merula</i>	251-500p			B	B	B	
A285	<i>Turdus philomelos</i>		51-100i	501-1000i	B	B	C	
A282	<i>Turdus torquatus</i>			11-50i	B	B	C	
A287	<i>Turdus viscivorus</i>		1-5i	1-5i	B	B	C	
A232	<i>Upupa epops</i>				A	A	C	

i = individuals; p = pairs.

Population: A: 100% > = p>15%. B: 15% > = p>2%. C: 2% = p>0%.

Conservation: A: Conservation excellent. B: Good conservation. C: average or reduced conservation.

Isolation: A: Population almost isolated. B: Population not isolated, but on margins of area of distribution.

C: Population not isolated within extended distribution range.

Table 6. Mammals listed under Annex II of Council Directive 92/43/EEC that are found on the Upper Rock.

Code	Name	Population			Site Assessment			
		Resident	Migratory		Population	Conservation	Isolation	Global
			Breed	Winter					Stage
1310	<i>Miniopterus schreibersii</i>	101-250i			A	B	C	
1324	<i>Myotis myotis</i>	11-50i			A	B	C	

i = individuals; p = pairs.

Population: A: 100% > = p>15%. B: 15%> = p>2%. C: 2% = p>0%.

Conservation: A: Conservation excellent. B: Good conservation. C: average or reduced conservation.

Isolation: A: Population almost isolated. B: Population not isolated, but on margins of area of distribution.

C: Population not isolated within extended distribution range.

Table 7. Species listed under Annex IV of Council Directive 92/43/EEC that are found on the Upper Rock.

Group	Species	Population	Motivation
Mammals	<i>Tadarida teniotis</i>	R	A,D
Reptiles	<i>Coluber hippocrepis</i>	C	D
Invertebrates	<i>Macrothele calpeiana</i>	R	B

Population: C=common, R=rare, V=very rare

Motivation: A. = National Red Data List, B = Endemics, C = International Conventions (incl. Bern, Bonn and Biodiversity), D. = Other reasons

*Macrothele calpeiana*

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5. The Face of the Upper Rock Nature Reserve

5. The Face of the Upper Rock Nature Reserve

The Upper Rock Nature Reserve does not receive the sort of maintenance that such a place requires if it is to continue being an important tourist attraction. Litter and graffiti abound, and roads and paths are often in a less than desirable state. As a result, the Nature Reserve has been criticised severely in the local press, particularly during the last two years. Criticism has come from opposition parties such as the Labour Party, the G.S.L.P./Liberal Alliance and the Independent Liberal Forum (now known as the Reform Party), as well as more independent organisations such as the Gibraltar Women's Association and the Gibraltar Taxi Association, and even features in the Gibraltar Chronicle written by their own reporters. All of these groups have been absolutely correct in stating that many parts of the Upper Rock are in a filthy state, and that considerable measures need to be taken if the image of the Rock that tourists take home with them is not to be one of rubbish, dilapidation and neglect. The photographs in Appendix 2 illustrate these problems extensively.

5.1 Litter

Litter poses one of the biggest problems to the Nature Reserve. Although roadsides are cleared of their litter regularly and effectively, those areas that fall outside the roads receive no attention. This has led to very embarrassing accumulations of litter in areas adjacent to roads and paths, which have been highlighted in the press due to the negative impact that this has on both our natural environment and tourists' perception of Gibraltar. Litter accumulates mainly around areas at which a large number of people frequently stop. This is exacerbated around locations at which macaques are found, as a result of illegal feeding (food packets and containers are frequently discarded after the macaques have been illegally fed). Equally, the area surrounding sites that tourists regularly visit are in a deplorable state. Other sites where litter abounds are areas that are used by 'smuggling spotters', who frequently take their take-aways and refreshments with them and consequently dispose of their containers in their immediate surroundings. Given that this sometimes occurs on a daily basis, the problem is a large one. Such areas include Douglas Path, O'Hara's and Spur Battery and the area immediately south of the Cable Car top station. This problem is caused partly by the lack of enforcement of laws that apply to the Nature Reserve, given that non-residents are not, by law, allowed within the Upper Rock after sunset.

An example of the way that litter accumulates off the sides of roads can be seen in Fig. 1.



Figure 1. Litter accumulates off the roadsides of the Nature Reserve, particularly at places where people frequently stop such as Hayne's Pumping Station, seen above.

If the present contractors are reluctant to clear these areas, then it might be an idea to hire another contractor to tackle these problems, whilst leaving the present contractor to

fulfil its current obligations. Since this litter is the result of accumulation over long periods, then this probably occurs relatively slowly and so clearing probably does not have to take place on a very regular basis. This means that these areas can be tackled only a few times a year, by either a fairly large work force that clears all areas at once or a small team that moves from site to site. It would be an idea, if all areas were to be tackled irregularly, for clearing to take place at critical periods, such as before the summer when the receding vegetation reveals litter accumulations or after the summer when the Nature Reserve has already received most of its visitors.

5.2 Graffiti

Graffiti is unfortunately a very prevalent feature of the Upper Rock. Walls, including those of historical structures and water tanks are most commonly affected, although even bare rock is not immune to this treatment. It is quite depressing to see that these areas often carry graffiti for years on end before anything is done about them, particularly when one considers the lurid content of much of this 'art work'. It is also extremely regrettable that, although it has occurred to a lesser extent (due mainly to inaccessibility), graffiti can also be seen within some of the caves of the Upper Rock. This is noticeable, for example, within the Goat's Hair Twin Caves that lie on the Mediterranean Steps.

Although it has come rather late, it is heartening to see that something has finally been done about the graffiti at Spur Battery, where such slogans as 'Smoke your joint with pride' provided a very embarrassing welcome to the many tourists who, whilst looking for parking in order to visit St. Michael's Cave, often visit Spur Battery. However, other historical sites that have been marred by similar artistic endeavours remain untouched by the management of the Nature Reserve. Notorious sites include Farringdon Battery, Douglas Path, Mediterranean Steps, O'Hara's Battery (where the immense graffiti lying below the gun can be read from Europa Point through binoculars), and in fact anywhere that vandals find accessible.

As has already been said, one particularly worrying aspect of much of the graffiti within the Nature Reserve is the sordid content of most of the material that these 'artistes' seem to have a penchant for. The authors of this report remember one particular occasion when ex-US President George Bush (Sr.) was visiting Gibraltar for half a day, and would be ascending the Rock in the Cable Car before being escorted on a walk towards St. Michael's Cave by dignitaries. The roads along this route had been cleared of litter beautifully and were looking immaculate, except for one small but very embarrassing detail. One of the water tanks along this road had been tarnished with graffiti, including one item, whose title 'The Rocket' lay alongside a space shuttle that had been drawn in the likeness of a phallus. What makes this even worse is that the 'artist' had even signed his 'work'. We are sure that the sight of this must not have impressed Mr Bush particularly, and the many visitors who had actually *paid* to get into the Nature Reserve must not have been especially amused either (entry to the National Gallery in London is free, and the art is of a far superior standard).

O'Hara's Battery was in fact restored recently by military personnel from the UK. However, the largest 'mural' (that immense graffiti) was missed, and remains there to this day as highlighted in Fig. 2. It is also sad to see that Princess Caroline's Battery, a site of considerable historic interest, was affected by litter and graffiti for many years, and has only been cleared up once that very direct economic gains from these actions have been discernable to the management of the Reserve (this site is presumably to become another tourist attraction). Rather than focusing on a site only when this is set to become a direct money earner, the whole of the Upper Rock should receive the same attention, given particularly that these areas are equally visible to visitors.

Figure 2. The graffiti at O'Hara's Battery is visible from Europa Point.



5.3 Roads

The very heavy traffic that flows through the Nature Reserve on a daily basis can be very taxing on the roads, particularly those that are not designed to hold such a volume of vehicles. Due to this, some of the roads on the Upper Rock are in a state of deterioration, particularly those that lead upwards from St. Michael's Cave, through which traffic has only been allowed in recent years. Furthermore, repairs along these roads often take a very long time, and makeshift barriers erected to protect roads from further deterioration are often present for lengthy periods, such as has occurred at St. Michael's Cave or above the Governor's Lookout. These constitute quite a striking eyesore, and cannot make the Nature Reserve look very appealing to visiting tourists, as can be seen in Fig. 3.



Figure 3. Road works – this makeshift barrier has been present at St. Michael's Cave for over a year, where nothing has been done to improve the situation.

In addition to this, another striking example of the length of time that it takes to get roads repaired on the Upper Rock were the potholes along Queen's Road, which rather than being repaired straight away, were marked by painting a white or yellow square around them, as can be seen in Fig 4. These then stayed like this for a long period of time, so much so that they were eventually repainted after several months of inactivity. So boldly marked were these holes (which were less than difficult to spot in the first place) that visitors to the Nature Reserve were now alerted to the fact that roads were in a bad condition. These potholes were thankfully filled eventually (after a few months), but at a prime tourist site such as the Upper Rock Nature Reserve works should take place as soon as they are required.



Figure 4. Potholes along Queen's Road remained marked by a white or yellow, square perimeter for a long time before being filled.

An interview with Mr Brian Bagu of the Support Services Department made us fully aware of some of the issues that roads within the Nature Reserve are faced with, and these are discussed next.

Most of the roads on the Upper Rock were never designed to deal with such heavy traffic, particularly those along the upper reaches. Therefore, although monitoring of road conditions within the Upper Rock only began in 2003, it is possible that these have been subjected to deterioration with the large increase in traffic, and this has made many retaining walls unsafe. Although most of these retaining walls have subsequently been made safe, some still need some work, particularly the one above Royal Anglian Way, which, in the

opinion of the Support Services Department, may be eroding due to macaque and goat activity around the wall. In this sense, a shuttle service would be beneficial to the Upper Rock in that it would relieve pressures on the roads.

Repairs along the roads of the Upper Rock are particularly difficult, since the Nature Reserve operates a one-way traffic system. Sites will continue to operate regardless of whether repairs are taking place, and so heavy traffic will continue to flow through the roads of the Upper Rock, making work impossible. In addition, facilities to work at night do not exist, and so road repairs are faced with an impossible situation.

The railings that run alongside many of the roads are not in a good state with many of the railings being bent or dilapidated, and even those that continue to stand straight are less than attractive. In light of this, serious consideration should be given to a complete refitting of railings along roadsides on the Upper Rock. If this occurs, then the use of a railing that is both more appealing to the eye and more in line with the Upper Rock's natural heritage should be considered.

A worrying aspect of roadside management from a wildlife viewpoint is the clearing of roadside vegetation. Roadsides provide small, open areas amidst the thick maquis, and are of disproportionate importance to herbaceous plants that cannot survive in areas dominated by maquis vegetation. Thus, some orchid species (all of which are rare on the Rock) such as the two-leaved *Gennaria*, *Gennaria diphylla* and the yellow-bee orchid, *Ophrys lutea* grow regularly on roadsides within the Nature Reserve. This means that, although the regular clearance of roadside vegetation is important, the manner in which this is done, and its timing, is crucial to the continuation of these areas as an important habitat for plants. It is a common sight, for example, to see workers clearing roadside vegetation at the height of the flowering season during the spring, and this cannot be justified on any grounds (Linares 1997). It is advisable to cut back woody vegetation, as this will accommodate both traffic and floral considerations. However, the clearing of smaller plants and flowers can only be justified once most plants have set seed and dried up, during the early summer. In addition to this, the way in which plants are cleared leaves a lot to be desired. Frequently, plants are scraped away rather than cut and the removal of these plants' roots accelerates the erosion of roadside soil. What is more, even the soil is sometimes scraped or brushed off the roadsides, leaving only bare rock! These practices have sometimes caused roadside rocks to become loose and roll onto the roads. All of this causes the deterioration of what is an important habitat for plants within the Nature Reserve.

5.4 Sewerage and Disused Pipes



A number of disused pipes can be seen around the Nature Reserve. One prominent example is that near the beginning of Mediterranean steps, an illustration of which can be seen in Fig. 5.

Figure 5. Disused pipes are often not removed, marring the aesthetic appeal of the Nature Reserve.

This pipe is a particularly good example in that it has been disused for many years, and provides a sharp eyesore in what is a very beautiful garrigue habitat with a wide variety of flowering plants. Such pipes are concentrated mainly on the southern side of the Rock (around Mediterranean Steps and its surrounding area), Anglian Way, the area south of the Cable Car Top Station and Princess Caroline's Battery, although individual pipes are scattered around the whole of the Nature Reserve. Most if not all of these disused pipes once belonged to the MOD, although MOD argue that these are now the responsibility of the Government of Gibraltar, since they are responsible for all aspects of land once this has been accepted.

One particularly worrying matter has been the ongoing sewerage leak at Martin's Path, just below St. Michael's Cave. This has been caused by what seems to be a blockage of the sewerage system leading down from St. Michael's Cave, possibly due to a combination of inadequate pipe diameter, increased usage and a lack of maintenance. As a result of this, a

stretch of approximately thirty metres is covered in sewerage, making access along the path impossible. This is clearly a health hazard to those who try to use the path, and in addition chemicals contained in the effluent may affect the flora and fauna of the immediate surroundings. It is important to consider, for example, that Martin's Path is one of the only sites in Gibraltar where the sawfly orchid, *Ophrys tenthredinifera* is known to grow, and the sewerage could seriously affect sensitive species such as this. In addition, the leakage is located directly above the beautiful New St. Michael's Cave, whose immaculate formations could be adversely affected by seepage of chemicals contained in this sewage.

5.5 Paths

Paths on the Upper Rock are regrettably not in a good state. Maintenance of these paths does not exist, and as a result many of them are overgrown, surrounded by litter and in some cases dangerous to visitors. Given that during the day roads are used by the very heavy traffic, then paths are extremely important to those who wish to appreciate the natural aspects of the Nature Reserve in peace and tranquillity. All paths should therefore be cleared of their litter, and vegetation should be cut back to allow visitors to negotiate these trails easily. In addition, paths should also be signposted clearly, and should include panels with information on points of interest such as the difficulty of the terrain, the nature and wildlife of the area, length and estimated walking time, and rules to observe when on these paths. An example of such panels and signposts, taken from the 'Parque Natural los Alcornocales', is given in Fig. 6.



Figure 6. Information panel and path signpost in the 'Parque Natural los Alcornocales'. Such panels and signposts should be erected at the beginning and end of paths within the Upper Rock Nature Reserve.

The problems that concern these paths are highlighted next, together with suggestions for their improvements.

5.5.1 Mediterranean Steps

Mediterranean Steps is undoubtedly the most important, and equally the most worrying of all paths. Although it has long been a favourite trail amongst both locals and visitors, the path has fallen into a state of disrepair that makes some sections dangerous to visitors. Large boulders block the path at a few points, the result of occasional rockfalls. Visitors have to climb over or around these in order to follow the trail, and given that some of these areas border cliffs, serious accidents are certainly possible. In addition, some parts of the lower path have eroded away, leaving slippery inclines that are dangerous to walkers. The handrail that once existed along this stretch is also, sadly, gone. This is certainly one of the reasons why this path is not used as often as it once was.

Litter has also been allowed to accumulate, given that the cleaning contractors do not clean any area that falls outside of the roads. This is particularly noticeable within the Goat's

Hair Twin Caves, where plenty of graffiti also exists. As can be imagined, the last thing that a walker wants to see on a path through a Nature Reserve is an abundance of litter and graffiti. These problems can be tackled by either extending the contract of the present cleaning contractors or awarding a contract to other contractors to tackle areas that are outside the contractual duties of the present contractors.

The lookout point that overlooks the eastern side of the Rock, about halfway up the steps, once had two benches and a protective railing to ensure the safety of visitors enjoying the view. This is no longer the case. The benches have almost ceased to exist (only the foundations of these are now visible) and the railing has completely disappeared, leaving the viewpoint in a dangerous condition. This is illustrated in Fig. 7.

Figure 7. The lookout point that overlooks the eastern side of the Rock is in a state of severe neglect.



All sites along the steps that suffer from similar conditions should be tackled to ensure that walking along the path is safe. A lawsuit from visitors who have suffered an accident could cost the Government, who are ultimately responsible for the management of the Nature Reserve as much or even in excess of the repairs that are required at these sites. Similarly, all of the WWII buildings that are located on these steps should be repaired and maintained to provide walkers with sights of interest.

In addition to those points highlighted above, the clearing of encroaching vegetation along the path on an annual basis is essential if visitors are to enjoy the use of this trail.

5.5.2 Martin's Path

The path that leads from Jews' Gate to St. Michael's Cave is in a state of serious neglect. The trail is littered with fallen pine trees (those that died during the drought of the 1990s; see Chapter 9), and these prove difficult for the visitor to negotiate. In addition, the vegetation along this path is dense and encroaches heavily on the trail, making access even more problematic. Perhaps the most serious problem along this path is the sewage that leaks out onto the path. This has made the trail impossible to traverse, given that about thirty metres of path are constantly covered in sewage. This is both extremely inconvenient to those who wish to use this path and unhygienic to those visitors who suddenly come across it.

The maintenance of this path is particularly important in that it is a trail that can be used by pedestrians in order to avoid what is the busiest stretch of road within the Nature Reserve. Furthermore, it is of interest to those who wish to appreciate the natural aspects of the Upper Rock, such as botanists and ornithologists.

5.5.3 Inglis Way



Inglis Way is the second longest path on the Upper Rock, shorter only than the Mediterranean Steps. It cuts straight through the thick maquis that dominates the middle section of the Nature Reserve, and constitutes one of the only walks on the Upper Rock where the visitor can be away from roads and traffic for a considerable period of time. However, this path, like all other paths, is in a state of serious neglect. The vegetation that borders the path increasingly encroaches on the walker's space, and litter problems mirror those of the Nature Reserve in general. Even building materials such as plastic pipes have been deposited along and around the path, as can be seen in Fig. 8.

Figure 8. Plenty of refuse can be found along Inglis Way, even discarded building materials.

Some WWII fortifications are to be found along Inglis Way, but these are in a state of severe neglect, and should be repaired and maintained in order to provide the visitor with sights of interest along the path.

The last section of the Inglis Way path cuts across the Bruce's Farm firebreak, which is no longer maintained as a firebreak and is therefore extremely overgrown (see Chapter 9, & 10 section 10.5). This therefore restricts access to the walker, cutting the path short. This firebreak needs to be maintained for this reason, as well as for the more important reason of safety to tourists, and above all the residents of the Bruce's Farm residential area.

A few years ago a number of GONHS volunteers cleared some areas around the Inglis Way path, leaving the predominantly olive canopy but providing openings amongst the thick vegetation. These areas have developed beautifully, and now carry a far greater diversity of flora than they originally did. This has enhanced the appeal of the trail considerably, and has improved the situation for wildlife in general. Indeed, the Eurasian woodcock, *Scolopax rusticola*, a rare bird in this area, has wintered in this area on several occasions since clearing began. However, clearing of these areas needs to be maintained, otherwise the vegetation will gradually thicken again to form the impenetrable maquis that once dominated these now open patches.

5.5.4 Royal Anglian Way

Royal Anglian Way could conceivably be developed into one of the most attractive, and certainly most accessible walks within the Nature Reserve. The walk, if cleared of rocks, is an easy one, and the combination of beautiful views both of the Rock and the Bay, a pack of macaques and a series of historical structures would make this trail ideal for visitors who wish to get away from the roads. Unfortunately, Royal Anglian Way is in the bad state that characterises all of the paths and trails within the Upper Rock. The path and steps are in many places covered in rubble and large rocks, litter is as prevalent as throughout the rest of the Nature Reserve, railings are dilapidated and some sections of the trail are therefore unsafe for visitors. Furthermore, historical buildings and structures have been neglected, making some of the WWII fortifications look very shabby. Repairs and adequate maintenance is therefore required if visitors are to be expected to enjoy this trail.

5.5.5 Douglas' Path

Douglas' path still receives a relatively high number of visitors, and as such the accumulation of litter throughout the whole of this trail is quite alarming. The sides of the path are strewn with litter, and many of the historical buildings and structures have been vandalised (particularly with graffiti) or used as refuse tips and latrines. The problem of encroaching vegetation that most other paths are faced with are not encountered along Douglas' Path, given that the trail is still used regularly and so vegetation is kept away by the trampling and brushing of walkers.

The steps that lead towards the 'Moorish' lookout are in a state of severe disrepair, and are thus dangerous to visitors. The path and steps are crumbling away at many places, and the railing along the steps is damaged along most of its length, and at some places non-existent. The 'Moorish' lookout itself, which should be maintained as a tourist attraction, is used as a latrine on a regular basis and visitors are thus always encountered with a very foul smell. This, as well as the WWII fortifications which offer superb views along both the west and east sides of the Rock should be properly maintained with the respect that potential tourist sites and important parts of our heritage deserve.

5.5.6 Other Paths

In addition to those mentioned above, other, shorter paths exist within the Nature Reserve. These should be managed in a similar manner to the longer paths, with consideration given to their cleanliness and to the management of vegetation surrounding these paths. Furthermore, visitors who wish to appreciate the Upper Rock's wildlife without the hassle of heavy traffic would certainly benefit from an extensive system of paths and trails, and it may be an idea to create new paths in addition to those that already exist. These could include circle paths, where trails begin and end at the same point. If this were to occur, then an idea may be to publish a pamphlet that includes a map with all of the different trails on the Upper Rock to be handed to tourists as they enter the Nature Reserve. Pedestrian use of the Upper Rock should certainly be encouraged, and in this sense it would also be beneficial not to allow traffic through the roads that lead upwards from St. Michael's cave.

5.6 Structures

In addition to the problems highlighted above, some of the structures found within the Upper Rock are either unsafe or mar what are otherwise beautiful views and landscapes.

One particularly serious problem, as highlighted in Chapter 7, section 7.3 & 7.6, is Charles V Wall. This wall, which should be maintained as one of the most important historical assets of the Nature Reserve is in a state of neglect, with severely damaged railings making the walk up or down the steps along the wall dangerous.

One building which merits a mention due to its visual impact is the private kennel that is found at Princess Caroline's Battery. This shabby building is extremely unsightly, and has no place at a site that many tourists visit. Furthermore, the development of the actual Battery as a new tourist site means that, when this is eventually opened to tourists, all visitors will have to pass directly beside the extremely unattractive kennel. Their first impression of the site would not therefore be a positive one. In light of this, we recommend that the owner or occupier of the kennel be relocated to premises outside the Upper Rock Nature Reserve. A photograph of the building can be seen in Fig. 9.



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Figure 9. The kennel at Princess Caroline's Battery is extremely unsightly, and should be relocated outside the Nature Reserve.

Some of the military installations within the Upper Rock are less than attractive. This is particularly the case with the aerials in the Rock Gun and Middle Hill area (some of which have already been brought down), which can clearly be seen at a distance from the Rock, and which break the Rock's impressive outline and shape. The worst of these are the two relatively new, large, iron aerials that sit at the very top of Rock Gun, on the crest of the Rock. Although it is acknowledged (although not fully accepted) that the MOD considers its priorities to override environmental or heritage considerations, it is unfortunate that these structures have such a noticeable impact on our Rock.

However, other MOD-owned eyesores do have some more achievable remedies. MOD cables run along railings that line many of the roads and cut down the centre of the firebreaks at St. Michael's Cave and Bruce's Farm (as can be seen in Fig. 10), making both roadsides and the seasonally colourful firebreaks look unattractive. A small effort is all that is needed in order to relocate these cables, perhaps beneath the soil or below the walls that line most of the roads, in order to make the Upper Rock look more attractive. This was done several years ago along the stretch of Queen's Road above Jews' Gate, where new MOD cables were placed in a culvert in the gutter east of the road. Furthermore, any cables that are no longer in use should be removed. In fact, the railings themselves are unattractive, and an effort should be made to replace these with railings that are more 'in character' with the Nature Reserve.



Figure 10. The cables that run down the centre of firebreaks at St. Michael's Cave and Bruce's Farm make these seasonally beautiful open areas look unattractive.

Another problem regarding aesthetics is the thoughtlessness with which the garage at Jews' Gate, which is allocated to the Gibraltar Tourist Board, has been located. This sits directly below a tourist attraction, and one at which practically all visitors to the Nature Reserve stop. Not only is the garage unsightly, but the almost constant excess of noise that emanates from the works that take place at this garage (with equipment such as drills and a noisy compressor) must prove very frustrating to those visitors who wish to admire the spectacular views that the location offers peacefully, as well as to researchers lodging at Jews' Gate. It would therefore be advisable to relocate this garage to an area outside the Nature Reserve, where its activities will not have an impact on visitors' and locals' enjoyment of the site. One good place to locate this garage would be at the new industrial park at Lathbury Barracks, where it would be located only metres away from the Jews' Gate site, without actually having an impact on the Nature Reserve itself.

The monument that stands on the lookout at Jews' Gate could be improved dramatically. Visitors to the GONHS' field centre at this site unfailingly comment on the ugliness of the so-called 'Pillars of Hercules', in fact a less-than-impressive structure composed of cheap-looking, composite material. This could for example be replaced with a well-maintained gun (given that this site was formally a battery) or even a cafeteria. The impressive views that this site offers, together with its very large number of visitors make it ideal for a circular cafeteria with large windows, which could even rotate to offer the customer views in all directions (although this would prove very expensive to install!). In fact, Spur Battery would provide an even better location for this sort of venture, as the views that it offers are even more spectacular. Access could however be a problem (as well as the number of visitors who visit this site, compared to Jews' Gate at present), but one must consider in this case that more cars can park on the road that leads up to Spur Battery than at Jews' Gate, and that this would also produce fewer problems in terms of traffic congestion.

A drinking fountain sits next to the 'Pillars of Hercules' monument at Jews' Gate. However, visitors who try to drink from this fountain quickly find that there is no water supply and so the fountain does not produce any drinking water. This should either be repaired or removed, as at the moment the fountain only serves to highlight the state of neglect into which most features of the Upper Rock Nature Reserve have fallen.

The Scouts' camp at Governor's Lookout could also be improved to make it look less unattractive. This applies in particular to the perimeter fence that surrounds the camp (as the access to the camp itself is prohibited to visitors to the Nature Reserve). At present, the fence looks very haphazard due to the constant, makeshift repairs that seem to take place, no doubt due to vandals who create breaches in the fence in order to gain access to the camp. This has two solutions. Firstly, a new fence that is more resistant to vandalism (but still friendly to wildlife) should be erected to replace the one that currently stands. Second, as has been said before, the Upper Rock needs to be policed more regularly, either by the Royal Gibraltar Police or by wardens to ensure that vandalism does not take place to the extent that it does now.

Finally as is mentioned in Chapter 8, some of the gardens belonging to houses within the Upper Rock, although perhaps attractive in their own right, are out of character with the Nature Reserve due to their layout and composition. As discussed in Chapter 8, a policy could be implemented whereby gardens have to conform to the general character of the Nature Reserve. Alternatively, fences surrounding these gardens can be covered (in an attractive manner) so that the garden and its plants do not have a visual impact on the aesthetics of the Upper Rock.

5.7 Picnic Sites

At present, no official picnic sites exist within the Upper Rock Nature Reserve. This is in contrast to most nature reserves anywhere else in Western Europe, and is a problem that needs to be addressed, particularly if the Upper Rock is to be enjoyed by a greater number of walkers. Formerly, the area around Governor's Lookout was popular with local families, who would frequently use it as a picnic site during weekends. However, even then, facilities for picnics such as wooden tables and benches were not provided, and users of the site had to provide their own tables and chairs. The creation of a number of picnic sites within the Nature Reserve would go a long way towards encouraging pedestrian use of the Upper Rock, particularly amongst locals who at this moment in time do not make as much use of the Nature Reserve as they perhaps should.

5.8 Recommendations

1) The litter problem on the Upper Rock needs to be addressed seriously. As well as a tighter enforcement of litter control laws, serious thought should be given to how cleaning firms are to be contracted in the future. It is strongly recommended that the cleaning of all parts of the Upper Rock (including paths), and not only the roads, should be one of the conditions to be met by contractors in any future negotiations. If the management of the Upper Rock is contractually tied to one cleaning firm that will only clean the roads, then it should consider hiring another contractor to clean all areas that fall outside of the roads. Although many of these areas are not readily accessible and are therefore difficult to clean, litter accumulates slowly and so cleaning probably only has to be carried out several times a year at each site.

2) Signs should be erected at tourist sites and popular stopping areas that should both educate on the impact of litter to the Nature Reserve and warn of the fine that is brought upon anybody who is caught littering.

3) An effort should be made to paint over all the graffiti that is currently found within the Nature Reserve, as these constitute a very serious blemish to the visual appeal of the Upper Rock. Since graffiti seems to be a popular pass-time, then this will have to take place on a semi-regular basis. A more effective way to control this would be to police the Upper Rock adequately. Since the Royal Gibraltar Police seem reluctant to do this intensively, then wardens should be employed for this purpose (amongst others).

4) The monitoring of road conditions that the Support Services Department has begun very recently is greatly welcomed. It is hoped that this will lead to a recommendation of a reduction in traffic through the Nature Reserve, as the structural damage that has occurred at several places has no doubt come about as a result of this.

5) The roads along the upper reaches of the Nature Reserve were clearly not designed to withstand the volume of traffic that they are currently traversed by. It would therefore be a good idea to restrict traffic along these roads once again (as occurred prior to the mid-1990s). This would be beneficial in several ways. First, it would relieve the roads from the immense pressure that they are currently under. It would also benefit walkers, with whom these roads were formally very popular. Finally, the wildlife of the Upper Rock would benefit greatly from areas with little or no traffic. Booted eagles, *Hieraetus pennatus*, (as well as other birds of prey) sometimes roosted along the upper reaches of the Nature Reserve in good numbers, but this is now rarely the case due to the increase in traffic.

6) Roadsides should only be cleared during the period after plants have set seed, so these practices should take place during the early summer.

7) Care should be taken to ensure that the correct methods are employed in the clearing of roadsides. Soil should by no means be brushed off, and plants should not be scraped off but rather cut back so that their roots are not removed.

8) Some roadsides should be cleared up to a distance of about four metres from the road. This will ensure that cars are not scraped by overhanging vegetation and will substantially reduce the risk of fire. It will also ensure the continued survival of plant species that rely on such areas, whilst having little impact on the maquis habitat. In addition, litter control on roadsides will be far easier as a result. Such roadsides could include Cave Branch Road, and parts of Queen's Road and Signal Station Road.

9) All disused pipes within the Nature Reserve, be they property of the Government of Gibraltar or the MOD, should be removed promptly, as these tend to spoil otherwise beautiful landscapes and views.

10) Paths should be clearly signposted, and information panels should be placed at the entrance to each path. These panels should include information such as the length of the path, its difficulty, history, what is likely to be seen (in terms of both heritage and natural history) and where the path takes the Rambler.

11) The boulders, rocks and rubble that currently abound over some parts of the Mediterranean Steps should be cleared to facilitate access to walkers.

12) Repairs should be made in areas where the path along Mediterranean Steps has eroded, and a handrail should be situated adjacent to the path over sections of the path where a fall over the edge could result in injury or death.

13) Litter and graffiti along all paths should be removed.

14) Serious repairs should be made to the lookout point half way up the Mediterranean Steps that overlooks the eastern side of the Rock. This should include the construction of new benches to replace those that have fallen into neglect and a railing around the perimeter of the lookout to prevent accidents.

15) Historical buildings and structures along Mediterranean Steps should be repaired and maintained, as these provide sights of interest to visiting walkers. These could include Perspex plaques with information on the history of the structures and of the path in general.

16) The overgrown vegetation that encroaches on all paths, particularly those that have fallen into disuse, should be sensitively cut back and cleared to ensure easy access to walkers.

17) All dead pine trees that have fallen across Martin's Path should be moved to one side or removed.

18) The sewerage system that runs along Martin's Path should be repaired or replaced to keep sewage from overflowing onto the path. Any material left on the path should be cleared so that visitors can once again enjoy the use of this trail.

19) All materials that cause an impact on the aesthetic appeal of the Inglis Way trail should be removed.

20) WWII fortifications along Inglis Way should be repaired and maintained in a similar manner to that recommended for those along Mediterranean Steps.

21) The firebreak at Bruce's Farm should be cleared and maintained in the manner described in Chapter 11.

22) Some habitat management should continue along Inglis Way. This was initially carried out by volunteers, who cannot be expected to then go back and clear vegetation every time this is needed - the clearing of vegetation is a difficult job.

23) Rocks, boulders and rubble along the Royal Anglian Way should be cleared.

24) Railings along Royal Anglian Way should be repaired to ensure the safety of visitors.

25) Historical buildings and structures should be repaired and maintained along Royal Anglian Way, complete with information plaques, as these would be of interest to visitors.

26) Historical buildings along Douglas' Path should be repaired and maintained. Some of these offer magnificent views towards both sides of the Rock, and would no doubt be appreciated by visiting tourists (who still visit this path regularly) if they were in prime condition.

27) The steps along Douglas' Path, as well as the railings that line them should be repaired in order to ensure the safety of walkers.

28) All other paths on the Upper Rock should be managed in a similar manner to the main paths.

29) The maintenance of paths and trails on the Upper Rock is extremely important given that, at the moment, visitors can only get away from the heavy traffic and enjoy a peaceful walk by using these paths. In fact, the management of the Nature Reserve should consider extending the current network of paths, possibly to include circular trails, where the walker begins and ends at the same point.

30) Pedestrian use of the Upper Rock should be encouraged both amongst tourists and locals who use the Upper Rock. A pamphlet with a map illustrating all of the different paths and trails that are found on the Upper Rock should be produced and handed to visitors entering the Nature Reserve.

31) The railing along Charles V Wall should be replaced with a new railing in order to ensure safety to visitors.

32) The kennel at Princess Caroline's Battery is extremely unattractive and should be

removed. The owner or occupier of this kennel should be granted alternative premises that fall outside the boundaries of the Nature Reserve.

33) All military cables, aeriels and pipelines on the Upper Rock should be removed by the MOD as soon as these are no longer in use. This includes cables that run alongside roads and down firebreaks.

34) Cables that are still in use should be hidden from the public eye. These could be located below the ground or below the retaining walls that line most of the roads.

35) The metal railings that line most of the roads on the Upper Rock are not attractive, and should be replaced gradually. New railings should have a more 'natural' or 'rustic' look. A perfect example of the type of railing that should be used lines the road that leads down towards the Ape's Den. These are thick and sturdy, and fashioned as if they were constructed of wood, even though they are comprised of synthetic material.

36) The garage at Jews' Gate should be relocated, perhaps to the new industrial park at Lathbury Barracks.

37) The monument at Jews' Gate should be replaced with some other attraction that provides visiting tourists with a better 'first impression' of the Nature Reserve.

38) The drinking fountain at Jews' Gate should be either repaired or replaced.

39) The fence that surrounds the scout camp at Governor's lookout is tacky, and should be replaced.

40) There should be some sort of control over what residents of the Nature Reserve grow within their gardens, as described in more detail in Chapter 8.

41) A few picnic sites (perhaps two or three) should be created within the Nature Reserve in order to provide further amenities to visitors and to encourage pedestrian use of the Upper Rock. One such picnic site could be located at Governor's Lookout, where the fairly gentle slope and presence of shady stone pines, *Pinus pinea* makes the site ideal. Another picnic site we recommend is the large, flat area at Princess Caroline's Battery. Picnic sites should be furnished with wooden tables, seats and dustbins, and signs urging the public to deposit its litter in the bins should be erected. Shade is also important to picnickers, and in this sense the presence of stone pines at picnic sites is ideal. Picnic sites could therefore be located at sites with pines, or alternatively pines could be planted at picnic sites. It is important that these picnic sites are close to roads and easily accessible, as litter is bound to accumulate in these areas and they must therefore be cleaned on a regular basis.

References

- Linares, L. (1997) Clearing of the firebreaks in the Upper Rock Nature Reserve. *Unpubl.*

An aerial photograph of Gibraltar, showing the rugged, rocky coastline and the city built on the slopes of the cliffs. The sea is visible in the foreground, and the sky is clear. The text '6. Geology and Caves' is overlaid in orange on the right side of the image.

6. Geology and Caves

6. Geology and Caves

Gibraltar is composed of several different types of sedimentary rock. Fossiliferous limestone dating back from the Jurassic period, some 200 million years ago, forms the main structure of the Rock of Gibraltar (Rose & Rosenbaum 1991). This shows striking evidence that this limestone mass overturned, with the older rock now forming the main ridge. Other sedimentary deposits found around Gibraltar are composed of mudstones and sandstones. These sediments were formed in what was once a tropical ocean called Tethys. During these 200 million years the Tethys Ocean contracted. Tectonic plate movements brought the continents of Europe and Africa closer together, therefore crumpling the mountain chains bordering the Mediterranean Sea. This produced an arc of mountain chains known as the 'Arc of Gibraltar' and is composed of the Betic Cordillera running along the mountain chain near Alicante, down through the Sierra Nevada and Sierra de los Filabres curving through the mountains on either side of the Strait and forming the southerly arc encompassing the Rif mountain chain of Morocco. In the process, the deposits lying between the two, mainly composed of limestone like that that now forms the Rock of Gibraltar, were overturned and thrust 100km towards the west, fracturing and faulting in the process. A tectonic plate that is split along the Strait area by the 'East Azores Fracture Zone' separates the two parts of this curve.

The thrust sheet forming the area of the Strait is composed of several geological units of which the Rock of Gibraltar is classified under the 'Tariquides' unit (Didon, in Rose and Rosenbaum, 1991). This type of rock is only found at Gibraltar, the mountain of Jebel Musa on the African side of the Strait, and a small outcrop south of Algeciras, which is being quarried. The uniqueness of the geology of the Rock of Gibraltar in relation to the surrounding countryside is a determining factor in the variety of flora that can be found here and signifies the importance Gibraltar has in contributing to the diversity of flora and fauna of the Strait area.

The collisions between the thrust plates closed up the Mediterranean Sea at both the eastern end, about 20 to 15 million years ago, and the western end between 6.7 and 5.2 million years ago. Intense evaporation took place, largely drying up the Mediterranean basin. This dry period eventually came to an end when the Atlantic Ocean broke through. Some authors (e.g., Hsu, in Drooger, 1973) believe that this event occurred several times before eventually filling the basin, but Hsu (1983) then states it to have been one cataclysmic event that produced an immense waterfall that took approximately 100 years to finally flood the Mediterranean basin and convert it back to a sea. Since then, major changes in the relative sea level have taken place. These changes were caused by the upheaval of the Rock, and also by changes in the polar ice cap during the ice ages that have resulted in the formation of several raised beaches and wave-cut platforms, a feature that is unique in the region. These changes in sea level have also resulted in numerous caves being formed through the action of the sea and the erosion of the rock by groundwater flowing to the sea (Rose & Rosenbaum 1991).

6.1 Geological Features

The Upper Rock Nature Reserve is located above the 100m above sea level mark. It is bordered to the west by the limestone cliffs that rise above the lower slopes and form the boundary between the limestone of the Upper Rock and the shale series found along much of the lower slopes. To the north, the limits are set by a series of impressive cliffs known as the North Face, which rise vertically from sea level up to 411.5m at Rock Gun Battery. The cliffs along the eastern side of the Rock drop vertically down to the talus and wind blown sand slopes, and reach their highest points at Spyglass Battery (424m), and O'Hara's Battery (416m). To the south, the Rock slopes steeply down toward the raised beach of Windmill Hill Flats.

The Reserve runs approximately north to south for nearly 2.5km, forming a sharp-ridged crest along its eastern border. An east west cross section of the Rock shows the features of an escarpment, with the western side sloping steeply at angles of approximately 18° to 39° to the edge of the reserve along the limestone cliff edge, and the eastern side dropping vertically down to the sand slopes. Most of the rock found within the Reserve is composed of two series of limestone. The older rock found on the upper reaches is composed of fossiliferous limestone, whereas the younger rock below is known as the barren limestones. This is due to the overturning of the Rock in its early development. Small outcrops of shale are found around the Jews' Gate area, where the shale series found along the Lower Slopes curve into. Another outcrop can be found in the Governor's Lookout area.

The bedding plane of the limestone on the Upper Rock corresponds closely to the angle of the western slope, and one can see the strata from the main ridge at the Cable Car Station

if you look towards the north. The rocks found along the main ridge show evidence of fracturing caused by the action of ice during the numerous glaciation periods. This has loosened blocks of limestone that lie on top of each other, held by gravity at the angle of the western slope, in line with the bedding plane. Because of this, major rockfalls on the eastside of the Rock originating from the ridge area are rare, and even those that are held by chains along the upper St. Michael's road along the main ridge will not pose a threat for some time to come.

6.2 Caves

Caves have been forming for thousands of years, as weakly acidic ground water has flowed down the cracks and fissures of the fractured Gibraltar limestone, reacting with and dissolving the rock. This has resulted in numerous caves around Gibraltar, with some located below sea level and formed during the ice ages when the level of the sea around Gibraltar was much lower, or when the landmass rose above the level of the sea (Rose & Rosenbaum 1991).

Some of caves within the Nature Reserve show evidence of occupation by early man. Testimony of this can be found in the results of many excavations carried out by enthusiastic military personnel in the 19th century, which prompted some renowned archaeologists to visit and excavate some of our caves in the 20th century. Amongst these were Abbe Breuil, Dorothy Garrod and G. Waechter. The former two investigated the site of the Neanderthal skull at Forbes Quarry and also the Mousterian rock shelter at Devil's Tower Cave. The latter accomplished a comprehensive excavation of Gorham's Cave at Governor's beach using the archaeological methods available at the time. No consideration was given to the caves located on the Upper Rock. This was possibly due to military restrictions in force during the two World Wars. These restrictions continued into the 1960s, during which time access was permitted to the local population only during daylight hours. It was during this period that the Gibraltar Cave Research Group was formed. This group had a major impact on the knowledge we now have at our disposal. One of the members of this group, George L. Palao, recorded in an unpublished map of 1966-68, over 107 caves, some of which have since been excavated and surveyed. Since then, other speleological enthusiasts have discovered a few more. In this chapter we will only be dealing with some of those that are found in a natural state within the Upper Rock Nature Reserve, or have been discovered within main cave systems or in tunnels that can be accessed within the Reserve. Fig. 1 shows the position of most the caves found within the Upper Rock Nature Reserve.



Courtesy Gibraltar Tourist Board

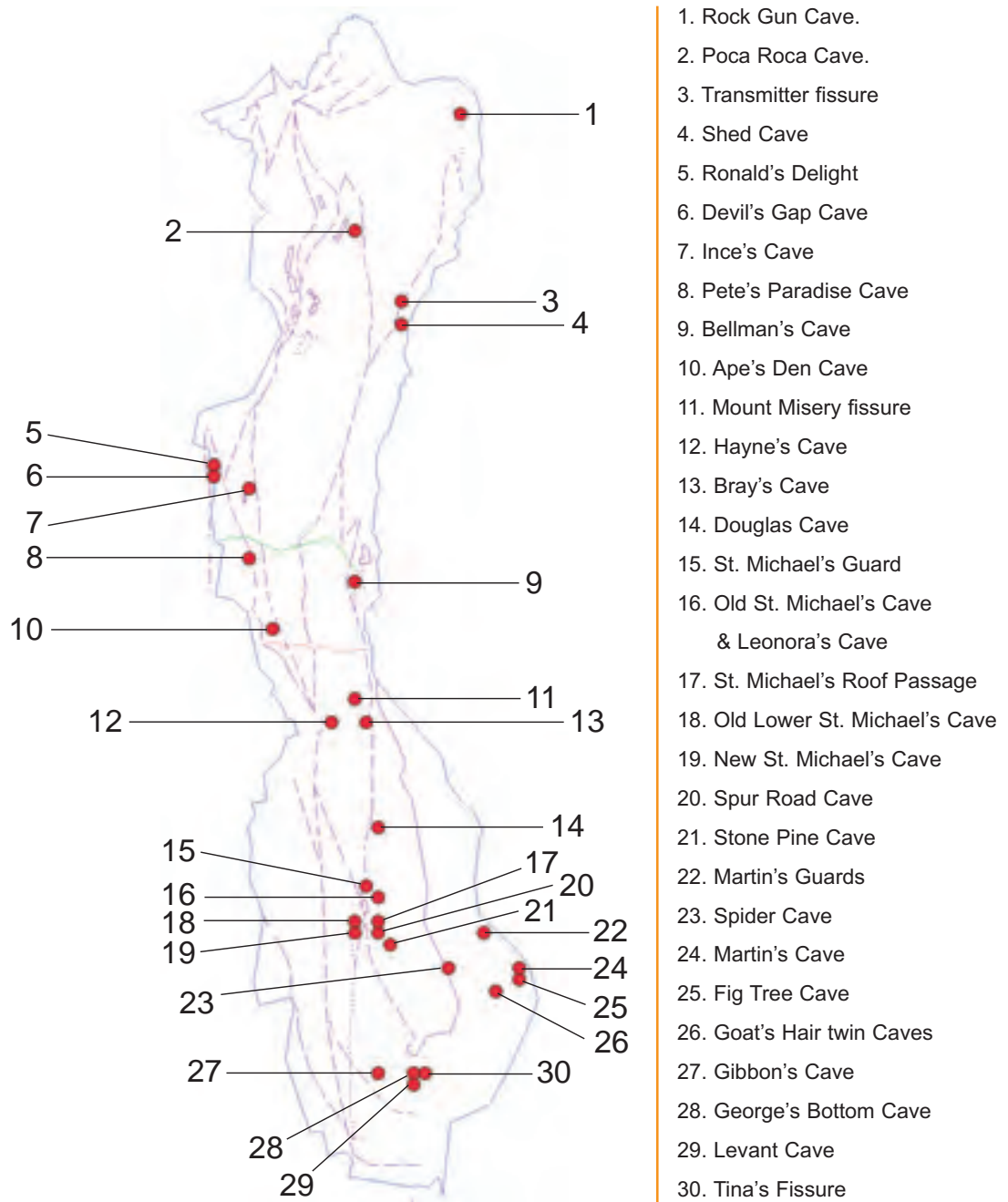


Figure 1. Some of the main caves found within the Upper Rock Nature Reserve.

Many of the caves within the Upper Rock Nature reserve are important for their wildlife, archaeological deposits and touristic value. Five are located in the area of Mediterranean steps. Eight can be found around and within the St. Michael's Cave complex. Another four are situated between Levant and Spur Batteries. A few are located along a fault line from Anglian Way to Spyglass and another fault area around the Ape's Den to Ince's Farm and Devil's Gap. The rest can be found at the northern of the Rock, around Middle Hill, Rock Gun and near Governor's Lookout.

During the process of tunnelling operations by the military, some caves were accidentally discovered. These obviously do not bear any archaeological deposits and have very little value to wildlife. They do however reveal some stunning formations, of which the ones found in New St. Michael's Cave are a prime example. A summary of some of the caves with biological, historical, archaeological and touristic value is included and is based largely on the valuable contribution that Mr. George Palao of the Gibraltar Cave Research Group and his colleagues made in the 1960s. In addition, one of the author's (C. Perez) experience in this field during the 1970s-80s has helped in the writing of this chapter.

6.2.1 The Mediterranean steps series

• **Martin's Cave:** The most important cave in this area is Martin's Cave. This cave was named after a gunner of the Royal Artillery in 1821. According to Palao (1969), the cave was first explored in 1840 by Captain Webber-Smith of the 48th Regiment. In 1867 Captain Frederic Brome also visited and excavated part of the cave. He unearthed two ancient swords of the 12th–13th century, together with a number of human remains including pottery, stone axes and flints. A number of bones were also retrieved, which included birds and reptiles. To commemorate his visit there is an inscription close to the entrance wall that reads, "This cave was explored by authority in June and July, by J. F. Brome Esq."

In 1957 a further excavation was carried out by the Gibraltar Archaeological Society under the leadership of the archaeologist Mrs. Celia Topp. They excavated around a platform in front of a set of columns that had been disturbed due to the laying of cables by the Army during WWII. In this area they found two neolithic sherds, one with carvings of concentric arcs on the exterior and the other bearing some impressions on the surface and possessing a lug around the rim. Several worked flints and cherts were unearthed together with shells and beach pebbles. There was a later excavation into the inner cave, but no record of the findings exists.

Cpl. J. Acock, who found bone points and blades of jasper, carried out the last known excavation in 1962-63. However, no formal record of this excavation remains (Palao 1969). This cave is situated 170m above sea level at the end of the Mediterranean steps path, before the climb begins. The ledge below the entrance to the cave has been undercut by wave action, forming a wave cut platform at what was once at sea level. This feature corresponds to the Gunz glaciation (Palao 1969). Sandy deposits here and to the south of the cave, together with a shell breccia deposit 16m above the cave entrance are further evidence of this.

Martin's Cave has a large entrance facing the Mediterranean. Access to the cave is gained along a narrow ledge of sandstone and conglomerate. Inside is a large chamber with the floor sloping down westwards. There are several columns and some small stalactites and stalagmites. At the end of the chamber the floor levels off into a muddy pool formed by water percolating through fissures and dripping from the formations above. The roof is quite dry in places, without the classic build-up of calcite deposits. The rest of the cave shows evidence of a time when the climate was much wetter, producing the formations found along the walls of the slope and nearer the entrance, which have now dried up. Cpl. J. C. Marshall (*in* Palao 1969) said that 'during and after rain one can hear torrents of water gushing in the roof of the cave'. Cpl. Marshall also stated that the cave was home to hordes of common bats, which 'all of a sudden disappear and then return at a later date'.

In the 1960s the cave held a very important breeding colony of bats, with an estimated 5000 Schreiber's bat *Miniopterus schreibersi*, and 1000 mouse-eared bat *Myotis myotis* (Palao 1969). From the 5th to the 12th November 1966, the Cave Research Group recorded hundreds on the roof and caught two, yet by the 19th November only small groups were present and a week later none were seen. On the 24th March 1967 the Gibraltar Cave Research Group recorded the presence of a noctule bat *Nyctalus noctula*, inside the cave (Palao 1969). Protection for the bats was provided by a strong metal gate that was installed by the military, presumably as part of the fortifications during WWII, as there are numerous power cables littered within this cave. This gate permitted little disturbance to the bats for many years, especially when the Upper Rock was in MOD hands.

With the transition of the Upper Rock to the Gibraltar Government, the number of visitors to this area increased. Vandals forced entry into the cave, breaking the gate and disturbing the colony of bats. There is also evidence that fires were lit inside the cave to force the bats out of their hiding places. With so many disturbances, the colony dramatically decreased in numbers by down to 10% or less of the original number. Therefore, during the late 1990s the GONHS's Mammal section, under the auspices of Mr. A. Santana, embarked on a project to seal off the entrance to the cave to visitors by installing a new gate. Some of the bats moved up to a tunnel at the top of Mediterranean steps where G. Palao recorded some 200 individuals, but this colony, which only consists of Schreiber's bats, now numbers a few dozen at most. This is augmented by wintering Schreiber's moving down from Malaga province to hibernate in this tunnel. Evidence of this has been found from two ringed individuals, one of which came from a cave close to the town of Benabarra in Malaga province (J. Cortes, *pers. comm.*).

Several interesting plants and ferns grow in the shade and cool environment that the cave entrance has to offer, including the maidenhair fern *Adiantum capillus-veneris*. In the sum-

mer fruit flies aestivate in the caves on Mediterranean steps. The walls of the cave turn black with millions of individuals covering the entire surface close to the entrance, an incredible spectacle worth seeing. It is possible that this formed part of the food resource for the bats that lived within, and is probably also of immense benefit to the many spiders living around the entrance. Hibernating moths also use the caves in the area during the winter.

- Fig Tree Cave: A small cave, only 80m to the south and level with Martin's Cave. It is located 3m above the path, and has a narrow and low opening, widening into a small chamber barely 1m high, and 2m by 3m with a narrow passage at a 40° angle ending in a muddy pit. The cave floor is composed of damp earth, and there is evidence of a small excavation although there is no record of such. This cave has a small invertebrate fauna similar to that found in Martin's Cave.

- Goat's Hair Twin Caves: Located at 190m above sea level, these two caves lie side by side 30m above the path leading to Martin's Cave. They have both been formed along vertical fractures, and water percolating along these has dissolved most of the rock. Both caves have a large, triangular entrance tapering off some 15m towards the end of the cave. This indicates the likelihood of marine erosion, as there is also a wave-cut platform and evidence of sand conglomerate outside the entrance that could indicate a past sea level. A small population of 300 Schreiber's bats was recorded in the 1960's, but in the last 20 years none have been seen in these caves. This cave holds similar wildlife to Martin's Cave, including a type of gelatinous, black fungus. The southern cave was excavated by the Gibraltar Cave Research Group in 1969 with some of the finds on display at the Gibraltar Museum, but the northern cave is still intact, although it is full of litter.

- Spider Cave: This is a very small cave located near the summit of Mediterranean steps at around the 400m mark. It stands at the southern bend of the last flight of steps near the top. It is formed within a solution cavity in a fracture leading down from Lord Airey's Battery. The cave was widened to provide shelter and accommodation to the military during WWII so that now very little remains of the original formations. Nevertheless, Palao recorded up to 100 Schreiber's bats during the late 1960's. However, none have been seen there in recent times. The cave lives up to its name, with a good community of spiders found within, including the Gibraltar funnel-web spider *Macrothele calpeiana*.



One of the Goat's Hair Twin Caves, which has still to be excavated

6.2.2 The St. Michael's series

- **Old St. Michael's Cave:** Of all the caves in Gibraltar, the most famous and frequently visited cave is St. Michael's Cave. The site was inhabited by neolithic man, and was also known to the Romans, who gave an account of this cave. Captain Fredric Brome, who was the Governor of Prisons in 1876, carried out the first excavations and employed the prison inmates for this task. He discovered various artefacts and implements providing an insight to man's early presence in this cave. Further evidence of the inhabitants of this cave came when the Gibraltar Scouts discovered a neolithic earthenware pot in one of the recesses between the pillars, on a clean-up operation of the cave in the 1970s.

This cave has two natural entrances; a roof passage located above the main chamber with a drop of approx. 25m that was sealed off, for safety reasons, and the entrance, that now consists of the main exit from the cave located beside the bar and shop area. The natural entrance of the cave is extensively fractured a few metres in to the north, possibly due to the blasting that took place when building the roadway. The cave widens and slopes south steeply to open into a magnificent chamber with a splendid backdrop of columns, called the Cathedral Cave. The area immediately in front of the Cathedral Cave was converted into a stage and the slope terraced to accommodate the seating area. The roof is approx. 25m high and is covered in stalactites along the fractures in the rock. To the southwest the cave drops vertically down another 10m, across which is located a bridge leading to the visitors' main entrance.

St. Michael's Cave provided cover during air raids. A further exit was required during this time, so this one was tunnelled through during WWII, with a further tunnel to reach the lower level where an operating theatre was being set up. In the process New St Michael's Cave was discovered. The passageway beneath the bridge provides spectacular views of the formations along this stretch. A section of one of the collapsed columns has been polished to reveal the beautiful structure of the rings that form this formation. Floodlights have been installed all around the cave to enhance the appearance of the structures with coloured lighting and this also provides the illumination for many of the functions that take place within this cave. To the east of the slope where the public seating is located is a small passage, which leads to a further series of the cave named Leonora's Cave.

- **Leonora's Cave:** Leonora's Cave is found within the Old St. Michael's Cave, to the east of the central area of seating above the main chamber. It is not known who discovered the cave but there is an engraving with a date hewn on a rock immediately in front of the entrance. Access is gained from the seating area 6m down a small scree slope, under a recess of the eastern wall of the Old St. Michael's Cave. Here the discoverer must have noticed either a slight breeze of air through a crack in a wall of columns signifying the continuation of a cave, or the hollow sound behind these columns. Whatever the reason, the result was that a gap was widened through these columns enabling access to the rest of this system. Leonora's Cave is a relatively small cave, but has wonderful formations that have not been affected by excessive visitor pressure, as has happened in the Old St. Michael's Cave. This is obviously due to this system not forming part of the touristic aspect of the cave and therefore being out of bounds to the public, and also because the chambers containing the formations lie well away from the entrance where the excessive dust found in the main chamber of Old St. Michael's Cave will not affect them.

- **New St. Michael's Cave:** This cave was discovered as a result of a tunnelling operation in 1942 that was initiated to provide access to the lower level of Old St. Michael's Cave, where an operating theatre was being constructed. In the process of blasting operations, the engineers noticed, when the dust had settled, that all the rubble had disappeared down a hole in the ground. Further investigation revealed the system now known as New St. Michael's Cave. Since the discovery, the Royal Engineers, as the custodians of the cave, installed a lighting system and improved the safety of the cave with a network of ropes in the chamber known as the boxing ring. They also provided ropes around the lake and along difficult areas. They allowed public access only under supervision of one of their guides, normally a Royal Engineer. However, in the 1970s, some local residents were included in the guide unit.

In the late 1980s the responsibility of the cave passed on to the Gibraltar Tourist Office (now the Gibraltar Tourist Board) and they now control maintenance and provision of guides through their cave co-ordinator Mr. Ernest Vallejo. The cave itself is a prime example of the wonders that water can produce, percolating and dissolving limestone over thousands of years to create remarkable formations, coloured in shades of yellows, whites and browns, reflecting the light of the torches and leaving visitors spellbound.

The cave runs north to south for a distance of approximately 370m. The entrance is located beneath a trapdoor 20m from the tunnel entrance. Here, the visitor descends a flight of steps and arrives in a small debris-strewn chamber. From here, a small crawl and a 3m descent brings one into the wet and live surrounding of the initial part of the cave. Immediately, one is aware of the constant flow of water down the sides of the walls. Curtain formations and flowstones are also immediately noticeable. A small passage opens up into the Great Rift or boxing ring, a large chamber with an intricate network of ropes to ensure the safety of visitors. Here, formations are scarce and the pattern of large blocks of rock cemented together by the precipitation of calcium carbonate indicates a more recent history than the rest of the cave.

Below this, a narrow passage drops down into another small chamber that is rich in formations and includes a pool of water. The cave now proceeds south through three magnificent stalagmite halls each bearing the most outstanding flowstones, curtains, helictites, stalagmites and stalactites that can be found in the surrounding region. As if this was not enough, the visitor is presented with beautiful reflections of the formations on this exceptional lake present within this cave. Incredibly, you can traverse the lake by walking along a narrow rim of up to 20cm around the edge of the lake. This rim is the result of deposits of calcium carbonate floating on the water and adhering to the edges of the lake over millennia. The final chamber, known as the southern chamber, narrows considerably at its southernmost point close to where is found a perfect palette. This unusual formation is reminiscent of a painter's palette, at an angle of 45°. The development of this formation cannot be explained. Three other perfect palettes can also be found in Pete's Paradise Cave. Due to the presence of lighting installation within the cave there are colonies of green algae growing on the walls close to the light bulbs. Other flora or fauna have not been discovered within this cave.

- Lower Old St. Michael's Cave: The entrance to this cave lies close to that of New St. Michael's Cave, near the west wall of the operating theatre area. Here, situated beneath a trapdoor, the entrance to the cave winds vertically down a narrow shaft of loose fractured rock known as the Corkscrew. Once at the bottom, a passage continues north and the rock walls are more stable. This opens up into a small chamber with several formations called the Grotto. An even narrower passage, which only very small-chested persons can negotiate, known as the Letterbox, continues to another small chamber. This second chamber is called the Prison because of the several columns reminiscent of a prison window. The air at this stage is dank and the cave narrows considerably with no further passages. The cave contains a small series of formations, but due to the small nature of the series it has none of the fabulous formations found in New St. Michael's Cave. There does not seem to be any evidence of any flora or fauna in this cave.

- St. Michael's roof passage: The roof passage lies 60m to the south of the natural entrance of St. Michael's Cave, and some 20m up the slope. Here the entrance is enclosed within a concrete compound and was covered with iron bars which have now rusted away. There are some calcite formations and an opening, along which is a small narrow ledge from where you can observe the Old St. Michael's Cave some 25m below. This exposed drop is extremely dangerous and the roof passage should be sealed off to prevent accidents.

- Spur Road Cave: This cave lies south of the Roof passage to the Old St. Michael's Cave. It has a small entrance, which opens into a chamber of 10m by 6m and 2m in height. There are relatively few formations, most of which show signs of having been broken for souvenirs. This chamber was used as a dump in the 1970s and the floor was covered with bottles and tins. At the southern end is a small opening or crawl that leads into another smaller chamber, again with no complete formations. The floor in the two chambers is composed of soft earth and does not seem to have undergone any excavation. The narrow entrance and small chamber would have provided early man with ideal living conditions and protection from predators. This and the following cave would seem to be the most promising candidates for an excavation that would provide an insight into the living conditions of early man in the St. Michael's series of caves.

- Stone Pine Cave: This cave lies just 20m south of Spur Road Cave. In appearance it is a replica of the previous cave except that it only contains one chamber. It also has a small entrance and an earthen floor, which again does not seem to have been excavated.

- St. Michael's Guard Cave: This small cave lies some 14m north of the Roof Passage. Its entrance is located 13m above the main entrance to Old St. Michael's Cave, and can be found by following some water pipelines that run along here. The entrance is 1_m tall by 1m wide and runs south for 7m. A passage slowly narrows at the end with the roof meeting the floor of the cave. There are no formations whatsoever and the walls are relatively dry. The walls around the cave entrance have been painted over and some graffiti can also be seen.

6.2.3 The Levant Cave series

- Levant Cave: Levant Cave was discovered during tunnelling operations to accommodate the command centre for the 9.2" guns. The cave runs on a north to south axis, along the same fault where New St Michael's Cave is located, and rumour has it that a very narrow passage connects these two caves (G. Palao, *pers. comm.*). The tunnelling has widened most of the cave, but there remain several areas with some beautiful formations of the kind found in New St. Michael's Cave.

- Gibbon's Cave: Further east along the tunnel where Levant Cave is located, another much smaller cave was discovered and named Gibbon's Cave. This cave was virtually destroyed through tunnelling action but some holes containing formations can be found along the walls of the tunnel. None extend very far, but they do offer refuge in the winter months to numbers of black rats *Rattus rattus alexandrinus*, as was observed in the 1970s.

- George's Bottom Cave: Obviously named after George Palao, the precise sequence of events that led to this remains a mystery that we have not dared to investigate. On the 27th November 1965 an expedition of the Gibraltar Cave Research Group, searching for new caves, came upon a small hole on the slope just below Spur Battery at a point 310m above sea level. The entrance was obstructed by a large boulder, but along the sides a fresh breeze emanated from the hole, indicating a potential cave. With the use of heavy lifting equipment, the boulder was subsequently removed and the entrance was revealed. This is only 90cm high by 1m wide and opens slightly once you crawl in. The cave opens out into numerous chambers and fissures on six different descending levels, the lowest of which could connect to Levant Cave (Palao 1969). Most of the chambers in this cave are difficult to manoeuvre in, and in places only allow for crawling space. Formations are plentiful and include curtains, columns, straws, helictites and corals, the last of which dominate parts of the chambers over which one has to crawl on one's hands and knees. There are a few soil deposits within this cave. These can mainly be found near the entrance and in the lower levels where it has collected down the numerous fissures present. Only recent remains of rabbit *Oryctolagus cuniculus*, and black rat *Rattus rattus alexandrinus*, and small invertebrates have been found in this cave.

6.2.4 Other caves

- Poca Roca Cave: This cave is located 210m above sea level, at the northern end of the Nature Reserve. It is found just west of Signal Station Road within the compound of the old Isolation Hospital, which is now a residential area. Located behind the buildings is a small vertical cliff that measures about 4m at its highest point. This spans north to south in a shallow arc, and the main entrance of this cave is situated along the central portion. The first reference to this cave comes in a manuscript by Capt. John Drinkwater (*in* Palao 1969) where he stated that 'there are several caves on different parts of the Hill in which water possessed petrifying qualities. One on Middle Hill called Poca Roca, was fitted up, previous to bombardment for the Governor's reception'. The Governor at the time was General O'Hara, who commanded Gibraltar from 1784-1790. It was left up to Lieutenant Holloway of the Engineers to fit the cave up as the residence of the Governor, an account of which is recorded in his diary on the 7th August 1789. However, it was never used as such, and eventually it was converted to a powder magazine (Palao 1969). The main chamber of this cave was converted into a bakery during WWII and evidence of the bread racks still remained there in 1975.

In 1869, Lieutenant Alexander B. Brown R.A. published a paper on the geology of Gibraltar where he mentions that a large fissure was uncovered near the entrance. This fissure contained numerous bones of small animals and some large ones including ibex *Capra pyrenaica*, red deer *Cervus elaphus*, and rodents, similar to ones found during the excavations into the Galleries (Palao 1969). The cave has been excavated several times in the last two hundred years and has revealed artefacts dating to an occupation by neolithic man. It had undergone major changes to the main chamber before Captain Frederic Brome started excavations in 1867. Busk (1868) believed the entrance could have been widened by marine action, and he believed that the cave connected to the eastern face above Catalan Bay. He based his assumption on Capt. Brome, who stated that the back chamber was filled with the same sand as that which formed the wind blown sand of the eastern slopes.

In January 1966 the Gibraltar Cave Research Group surveyed the cave. This was followed by a small excavation of the lower level chamber of the cave in 1966 by two of its members, George Palao and Luis Payas. They uncovered deposits of charcoal throughout the entire length of the excavation together with deposits of red and yellow ochre. Evidence of human occupation came from fragments of pottery, together with remains of edible terrestrial and marine shells in all the layers. A quantity of bones was unearthed together with the

skull, vertebrae and a complete hoof of an ibex.

The survey of the cave revealed that the Main Chamber is 23m long by 12m wide. This is the chamber that was modified to accommodate the Governor, and most of the formations here have been destroyed. There is an extension to the main chamber, but this is choked with boulders. A flight of concrete steps leads down to the Lower Chamber, which is 23m long and 6m wide. Half of this chamber has also been built within, but there still exists a magnificent flowstone at the eastern end. From here, a small passage 20m long by 2m high, which seems to have been widened due to the presence of drill holes, leads to a small cavern 5m long and 6m wide. Here, on the floor of the cave, are the sand deposits that Brome and Busk referred to as similar to the eastern sand slopes (Palao 1966).

- **Pete's Paradise Cave:** The Gibraltar Cave Research Group discovered this cave on the 26th February 1966, while practising abseiling down the western cliffs near the Ape's Den (G. Palao, *pers. comm.*). The cave is located 16m below Queen's Road, just south of the 'Moorish wall'. The entrance is composed of a narrow fissure of 6m in width by 1m in height. This opens slightly into the initial chamber, which has a very low roof and an earthen floor. Here, an initial excavation took place, which uncovered numerous sherds of the type found in Poca Roca Cave. Also found were an engraved bone bead and several tools composed of chert, together with small mammal bones. This was followed by another excavation during the 1970s, results of which are unpublished. This cave was also surveyed by the Palao team, who registered the formations to be '...of exceptional value' (Palao 1969).

There is little standing room inside this cave, and the chambers with the important formations are accessed from the entrance chamber via a narrow crawl 8m long, 50cm high and 60cm wide. Here, Palao named four chambers, each of which contains unique and beautiful formations, the likes of which are nowhere to be found in other caves in Gibraltar. The Nun's Chamber contains a fresh water trough within a large rimstone pool of 45cm in depth. This is filled by precipitation flowing down a flowstone immediately behind the pool. The Rimstone chamber is composed of a set of terraced rimstone pools, the levels of which vary according to the annual rainfall. There are some stalactites and columns in this chamber and a set of beautiful curtain formations.

Beyond this, one arrives at the Pearl Chamber, a small 6m by 4m area, which contains a small shallow rimstone pool that contains unique cave pearls. These are tiny beads of calcite that have formed when the calcium carbonate has adhered to small grains of sand and coated the grain annually with layer after layer. Some of the pearls measure up to 3cm in diameter whereas many more are very tiny and have fused with the cave floor. The last of the chambers, the Hall of Pillars, is according to Palao (1966), 'the most beautiful section'. Here the chamber measures 12m by 8m and is surrounded by magnificent columns, with a pool of water within another rimstone of 35cm in depth. The value of this cave is tremendous, since it also contains three of the four perfect palette formations in existence in Gibraltar. The fourth can be seen in New St. Michael's Cave, near the end of the Southern Chamber.

- **Bray's Cave:** This cave is located 10m below St. Michael's Road and 35m south of the viewing platform at the northern end of Douglas Path. There is no record of the discovery of this cave, possibly because it really is very small and was not considered noteworthy. The cave is in reality a rock shelter, where the front wall extends north to south some 8m in length and 5m in height with the top overhanging to form the shelter. At the southern end there is a small crevice where some formations can be found, including a few curtains and some stalagmites and stalactites. The cave floor here is composed of calcite from the percolation of water through the fissures. There is a possibility that the cave could extend beyond these formations and that these have blocked the continuation of the cave. The rest of the rock shelter was covered in a combination of damp earth and small rocks and stones that had accumulated here over the centuries. The excavation in 2002 revealed an Iron Age burial site, which is unique in the region together with remains of Ibex and other small mammals.

6.3 Threats to Cliffs

Threats concerning the geology of the Upper Rock Nature Reserve can come in various forms.

- 1) The outline of the Rock must be protected as it represents the unique silhouette of our homeland. In this respect no other buildings (either large or small), monuments or erections other than the ones in place should be granted planning permission, as this would break the skyline and disrupt the shape of our Rock. This should apply equally to the MOD areas of Rock Gun, Middle Hill and Spyglass (see L/N 51 of 1993 6. (1), pp.116).

2) Buildings and erections that break the outline of the Rock and do not serve any purpose and have no historical or touristic value should be removed forthwith. In this respect, work has now begun on the removal of aeriels within the MOD Aerial Farm around Middle Hill, which posed an eyesore to this beautiful part of the Rock, and some of the wooden towers have already been dismantled.

3) Up to 80% of the boundary of the Upper Rock Nature Reserve is composed of cliffs. Some of these are relatively small (30m to 50m in height), whereas others rise from the base of the Rock near sea level to 400m in height at Rock Gun on the North Face of the Rock. Although the Jurassic limestone is a very stable rock, there are areas along the top ridge where the rock has fractured. Also, in some places along the North Face, the rock composition is unstable and brittle, due to the emanations of the old Refuse incinerator mixing with rainwater to form weak acid, which partly dissolved and weakened the structure of the rock. This presents the problem of rockfalls in the areas immediately below these, and ways of tackling this threat that do not prejudice the geology and the living environment have to be found. First of all, there should be a safety zone/perimeter fence erected at an adequate distance away from the cliff base that should guarantee the safety of persons and buildings close by. In the case of the base of the cliff sloping away, a catchment area should be excavated around the base of the perimeter, as this would hold falling rocks and prevent them from rolling down the slope.

4) Cliff 'stabilisation' is really not an option. No matter how much work is done and money is spent on this, the topography of Gibraltar is such that rockfalls are bound to occur. Firstly, it would not be feasible to stabilise all the cliffs. The size and surface area is considerable and the aesthetic appeal of these cliffs, as well as their important fauna and flora (which merit 'Natura 2000' designation) would be lost. A prime example can be found at Camp and Little Bays, where cliff stabilisation has taken place. The problem of Camp Bay was compounded by the tunnel that was driven through an unstable section of rock close to a shale boundary. Likewise, Little Bay area is the remnants of a rock quarry. Therefore, loose rocks were likely to abound. The cliffs there have now lost a lot of their character due to the rock surface being coated in a mass of concrete, whereas in other areas stabilising metal rods have been drilled into the cliff, destroying the natural appearance and in the process also destroying many cliff loving plants in a unique habitat. It is only natural that the Government has to protect itself from lawsuits in this day and age, where health and safety regulations have reached new heights. However, one must look at the other side of the coin and not try to prevent any and every possibility at the expense of destroying the natural habitat and aesthetic value that our cliffs have. This would not occur in a Nature Reserve that contains globally important cliffs in any part of the world.

Obviously, prevention is better than the cure and in this respect the authorities should be extremely careful when granting planning permission to buildings that are to be constructed close to the base of cliffs. This applies equally to buildings at the base of slopes above which cliffs are situated. Prime examples of the risks involved are to be found at the Both Worlds development, above which the MOD have installed a series of strong metallic nets to prevent rockfalls. Another area where rockfalls occur frequently is at Catalan Bay, where an unstable area of cliff to the south of the entrance to William's Way tunnel has rendered the Government's asphalt plant below unusable. This area has now become the catchment for rockfalls, but due to the instability of the cliff it would be a wise measure to construct an embankment and erect strong metallic nets close to the roadway to prevent large rocks rolling across this.

5) The south corner of Catalan Bay village has been the area to suffer the majority of rockfalls, originating from the cliffs of the Upper Rock, in recent history. Here the slope is contiguous with the south side of the village, affording no protection whatsoever, except for the roadway, which offers little in the way of a catchment area. The angle of the slope in this area is too steep and the velocities attained by rocks rolling down the slope too great to be retained at this point, as they would bounce over and continue downhill into the buildings in the village. Even the presence of palm trees and acacias on the slope is insufficient to break the fall and velocity of some of these rocks, and therefore it would again be wise to erect a similar rockfall defence on the sand slopes as that found at the southern end within the MOD area.

6) To achieve full protection of the cliffs, the boundary of the Nature Reserve should run along the base of the cliff line surrounding the Upper Rock.

6.4 Threats to caves

1) There was no adequate protection for the caves of Gibraltar considering the natural, archaeological and touristic value they have. Ever since their discoveries, caves have been robbed of their archaeological treasures, most of which have been deposited in the British Natural History Museum. This used to take place in the 1800s and early 1900s after which legislation, first under the 'Gibraltar Museum and Antiquities Ordinance, 1982' (L/N 20 of 1982) and subsequently under the 'Gibraltar Heritage Trust Ordinance, 1989' (L/N 12 of 1989) and its subsequent amendments, currently under review, prohibits unauthorised excavations. Every effort should be made for the return of these artefacts and their deposition in the Gibraltar Museum.

2) Many of the caves in Gibraltar have had pieces of stalagmites and stalactites broken off and taken as mementoes, and the walls of many caves abound in graffiti, some dating back over one hundred years. Pete's Paradise Cave is a prime example of the vandalism that some of the caves have endured. This cave was only discovered in 1966 and contains some unique examples of formations. However, many of its formations have been broken off, cave pearls have been removed and some of the rimstone pools have been broken, whilst others have had the muddy deposits on their beds disturbed, allowing the water to filter through and disappear. Legislation is in place under the 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993), which states, "No person shall damage or deface any structure including any natural structure in the reserve". This should be sufficient to dissuade any vandalism, but enforcement is paramount.

3) Refuse deposition within caves is an escalating problem. Those caves which provide easy access to visitors, especially those found along Mediterranean Steps and St. Michael's area are found in an appalling state with rubbish accumulating over the years. Some of these caves still contain the remnants of rusting debris from the occupation of the military during WWII, with the additional refuse of constant visitations since. This effect was compounded when the Upper Rock was opened to the public, and has not improved since the handover to the Gibraltar Government, because there has never been an adequate management plan.

4) Access to caves is not controlled in any way. Anybody can visit the caves on the Upper Rock Nature Reserve except those in MOD areas and those found within the tunnels. Mr. Ernest Vallejo and his team of approved guides manage access to new St. Michael's Cave, and bookings can be made through the Gibraltar Tourist Board, which is ultimately responsible for the cave. A limit is imposed as to the number of visitors per guide for health and safety reasons, and this is closely adhered to. Visitor numbers to Old St. Michael's Cave are not controlled and statistics are therefore unavailable. Visitor pressure is enormous bearing in mind that nearly all the tourists that enter the reserve visit the cave. Although the opening hours of this cave are from 09:30hrs to 18:00hrs, there is no limit as to how many visitors can access the cave throughout the day and no limit on the numbers present within the cave at any one time. Entry is not allowed half an hour before closing time to allow visitors to exit the cave, and the cave is checked every evening to ensure that nobody remains behind. These uncontrolled numbers of visitors throughout the years has resulted in a major deterioration of the cave. Most of the formations are now 'dead'; i.e., the formations have no water flowing over them or percolating down from the roof of the cave to formations below, and have therefore stopped growing. This is mainly the result of smoking and dust and fine silt (disturbed by the feet of hundreds of thousands of visitors to the cave over the years) being deposited on the wet surface of the formations and preventing the entry of water through narrow fissures, stemming their flow until the formation dries out and dies. This problem is compounded by the amount of rubbish found in recesses in the cave and along dark unlit sections where visitors frequently deposit this. Adequate cleaning and availability of more litterbins would improve this situation, and certainly a limitation on visits would be a step in the right direction. The numbers permitted daily should be assessed by the Board of Management based on the impact these visitations have on the cave, and there should be restoration works and cleaning programme that would affect the formations to restore the same back to their former glory.

6.5 GONHS

It is worth mentioning that a small group of agile and experienced persons form the speleological and rock climbing group of GONHS. This autonomous group is based at the Governor's Cottage on Mediterranean Road and have surveyed most of the caves to be found on the Upper Rock. They frequently participate in rock climbing and have several training areas around their base. Their contribution to GONHS is extremely valuable since they are able to survey inaccessible areas of cliffs for all types of wildlife. They were also actively involved in the environmental impact assessment on the cliff stabilisation project of Little Bay, and were recently involved in active measures to ensure the conservation of one of our pairs of the peregrine *Falco peregrinus*. As such, they are a fundamentally important asset to the aims and objectives of the management of the Upper Rock Nature Reserve.

6.6 Recommendations

- 1) All caves along Mediterranean Steps should be cleaned of all refuse and debris.
- 2) Access to Martin's Cave should be restricted on the grounds that the bats should be allowed to re-establish themselves as breeding colony and a winter roost.
- 3) A panel should be erected outside caves informing the public of the historical and natural heritage each contains. This should include a warning against refuse deposition and vandalism/graffiti, and there should be a separate sign indicating this and fire hazards before the approaching walk towards the area where the caves are located.
- 4) There should be a cleaning campaign of all the St. Michael's series of caves. In the Old St. Michael's Cave this requires not only the removal of refuse, debris and obsolete lighting cables and ancillary equipment, but a concerted effort to 'mop up' the inside of the cave and remove all the excess dust, dirt and fine earth. Since expertise on cave restoration does not exist on the Rock, advice and assistance should be sought from outside Gibraltar. Given that works are likely to require special, expert attention, it is possible that an external workforce may also have to be sought. These are potentially huge tasks that may require tackling in several stages.
- 5) There should be an information plaque on the road above Bray's Cave, indicating the position of the cave and containing a summary of the archaeological wealth unearthed there. This cave requires the removal of the debris of the excavation, which was dumped further down the slope. The cave shelter itself must be rendered safe since large crevices between boulders and rocks, the result of the excavation, pose a danger to the public.
- 6) A Cave Management Committee should be appointed, and should hold responsibility for all the caves of Gibraltar. This could be constituted of employees of the management of the Nature Reserve, organisations or bodies with an interest in caves and amateurs with a long-term interest and association to the caves. The Committee should thus be composed of members such as GONHS (flora and fauna) Heritage Trust, Gibraltar Museum (historical and archaeological heritage), MOD (caves located within their land), Cave Research Groups (support and liaison with projects, surveys, excavations, etc.) Ministries of the Environment and of Heritage (regular maintenance, signposting, information plaques/panels and finances for caves outside the Upper Rock) and the Upper Rock Nature Reserve Management (access, regular maintenance, signposting, information plaques and the financing of all of the above from the entrance fees into the Reserve).
- 7) The Committee should regulate access to caves of a sensitive nature, e.g., bats breeding or roosting, archaeological excavations in progress, or caves located within MOD property.
- 8) The Committee should ensure that all cavers and visitors to caves designated in a high-risk category are covered by adequate personal and unlimited liability insurance.

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7. Heritage

7. Heritage

The presence of man on the Rock of Gibraltar reaches from as far back as the Neanderthals to the present day. Throughout this period the Rock has been visited by Phoenicians, Carthaginians, Greeks, Romans, Visigoths, and colonised by Moors, Spaniards and the British. Vestiges of the occupation by some of these civilizations can be seen around Gibraltar, but only a few, though quite notable, are to be found within the Upper Rock Nature Reserve. These assets form part of the historical wealth of the Nature Reserve, and as such must be conserved and protected for future generations. They should, however, also be developed for their touristic, educational and scientific value. In this respect all historical heritage must fall under the management plan of the Upper Rock Nature Reserve. Some of the most important of these sites are listed next under their corresponding period or locations, together with a brief history of how these constructions came into being.

7.1 Caves

The caves on the Upper Rock Nature Reserve are covered in Chapter 6, and immediate and remedial action for the caves is dealt with there. Only St Michael's Cave has been developed as a tourist site, and this includes a display of a family of 'early man' residing within this cave. Some other caves are in a pitiful state and all have as yet not been cleared of refuse, preserved, developed or incorporated into a management plan.

7.2 Moors

Tarik Ibn Ziyad invaded the region and landed successfully at his second attempt near Gibraltar in the spring of 711 AD. He marched westwards and took the ports of Algeciras and Tarifa, followed by Gibraltar. Arab Chroniclers recorded that the Rock of Gibraltar, '*Mons Calpe*' was renamed 'Jebel Tarik', (Tarik's mountain) after the location close to where he had landed, and this name was corrupted to the name we now know as Gibraltar (Jackson 1987).

In 1068 AD the Arab governor of Algeciras was ordered to build a fort on Jebel Tarik. The Moorish Castle was built and the fort was held until 1146 when the Almohades took over from the Almoravides. In 1160 Abdu-l-Mumin was so impressed by Jebel Tarik's strategic importance that he ordered the building of a fortified city, which he called Medina-al Fath (Jackson 1987). It is difficult to determine how much of the city was built, but most must have been included within the castle walls. During this period, the engineer and mathematician Haji Ya'ysh built a windmill at the top of the Rock (Jackson 1987). No evidence of this construction remains at this site.

The only other historical structures attributed to this period are the 'Moorish' wall, which runs from Genoese Battery along the southern part of Ince's Farm up to the top of the Rock near the Cable Car top station, and a 'Moorish Tower' on the ridge along Douglas Path. However, it has since been revealed that these two constructions may be attributed to the Spanish and British periods (C. Finlayson, *pers. comm.*). The 'Moorish' wall it seems, was the first attempt at the construction of the Charles V Wall that now lies further south, and the 'Moorish Tower' was probably built during the very early British era.

The Tower of Homage (the most noticeable and well-known part of the Moorish castle) and its walls lie on the fringes of the Upper Rock Nature Reserve. Therefore, access to this site is included as part of the payment for entry into the Nature Reserve. A refurbishment programme is presently being carried out at this site by the Gibraltar Tourist Board, under the supervision of the Gibraltar Museum. Tourist access will not be allowed until the works are completed. The site will be extended to include those used presently as the prison, once these facilities are transferred to the new location at Lathbury Barracks. This is welcome news, but continued efforts for restoration should also include those other historical monuments and buildings found within the Upper Rock Nature Reserve.

The 'Moorish' wall, which experts have recently determined to have been constructed within the Spanish period (C. Finlayson, *pers. comm.*) shows evidence that it was once higher than it presently is. For the sake of this document we will continue to call it the 'Moorish' wall, as it is commonly known locally and in all publications so far. The whole stretch of wall seems to have been partly dismantled and used as building material for the Charles V wall, only a few hundred metres to the south. The height along most of the wall is approximately 2m, but nearer the top of the rock the wall almost disappears, as most of the material must have been removed, possibly to build the signal tower at the location where the wall ended. Along its length the wall is totally concealed by the tall vegetation and the visitor is totally unaware of its whereabouts except where the roadway has breached this, and there is but one plaque with a few lines of information that reveals its presence.

There is also a building along the 'Moorish' wall, just above Charles V Road that George

Palao refers to as a 'Visigoth' building, in his account of bat populations in Gibraltar (Palao, *Unpubl.*). This building seems to be of the same age and construction as the 'Moorish' wall, has a pitched roof and very thick walls and might have been a water cistern, although an outlet on the west-facing wall would not seem to indicate this. The entrance to the building is raised above the floor, which is damp and muddy, and the walls are covered in graffiti. The surprising thing is that since this building is not visible from the roadway, not many people know of its location or have ventured inside, and the graffiti that is found there seemingly dates back to the 18th or 19th century, with etchings of the mast sailing ships and man-o-wars of that period.

The 'Moorish Tower' located on Douglas Path has also been determined by experts to have been constructed during the British period, and not by the Moors (C. Finlayson *pers. comm.*). For the purposes of this document it will remain under the Moorish section as it was popularly regarded as Moorish. It is situated at the top of the steps leading up from the viewing platform on St. Michael's Road. It is a small round tower some 2m in height, which can accommodate two standing individuals, and is rugged in its construction. Unfortunately the tower is used as a toilet and for depositing refuse, and there is no information panel at this location indicating the history of this tower.

7.3 Spaniards

In 1462 the Count of Arcos, Rodrigo Ponce de Leon and the Duke of Medina Sidonia captured the Rock of Gibraltar from the Moors and left the Guzmans in possession (Jackson 1987). The town of Gibraltar grew, and with this growth came extensions to the mole. In 1502 Gibraltar received a Royal Warrant granting it new Royal Arms to replace those of Medina Sidonia. The Royal Arms depict the Castle and Key, and can be seen on the Southport Gates. They also form part of the Gibraltar flag.

In 1540, Corsairs landed after dark near Europa Point and raided the town enslaving many of the citizens. Pleas by the residents to improve the defences were answered twelve years later. Charles V, King of Spain and emperor of the Holy Roman Empire sent an eminent Italian military engineer, Giovanni Battista Calvi, to see what could be done. He built the wall known as Charles V wall, to the south, in order to protect the town, but the city was still vulnerable to attack along the Upper Rock. Therefore, another Italian engineer by the name of Frattino extended the wall, just a few hundred metres south of the 'Moorish' wall, to the top of the Rock (Jackson 1987).

During Philip IV's reign, Gibraltar's fortifications were modernised and several gun batteries were built to protect the town. Of these, two were located on the Upper Rock with San Domingo on the site of Ape's Den at the lower end of Charles V Wall, and the other on the site of Genoese Battery, at the lower end of the 'Moorish' wall. Only the foundations of these batteries remain at these two sites.

During the Spanish period many churches and chapels were established. One of these, Nuestra Señora de Guadalupe, was located at Signal Station on the location of 'El Hacho'. There appear to be no remains of this church at this site (Chichon 1983).

7.4 British

On the 4th August 1704, Admiral Sir George Rooke and Prince George of Hesse-D'Armstadt took possession of Gibraltar. The Spanish population fled and based itself on a hill where they founded the town of San Roque. The fortifications were reinforced for the counter offensive and a stable population based mainly on military personnel slowly grew. Thus the British occupation of Gibraltar was firmly established and remains to this day.

Among the many fortifications that were mounted in Gibraltar, some batteries were established towards the northern end of the Rock overlooking the Spanish lines. Willis's Battery, named after a Captain Willis, was built where Princess Royal Battery now stands, and the Salto del Lobo Battery where Princess Caroline's Battery is located (Jackson 1987). No evidence of these batteries remains at these sites, but some of the magazines that are located on Willis's Road form part of a tourist attraction called 'A City Under Siege'. Colonel Green established another battery at a point 200m below Rock Gun, now known as Green Lodge Battery. The cannonballs from this gun reached much further than Willis's Battery owing to its height, so the gunners then installed a new gun at the highest point of the northern end of the Rock thereby establishing Rock Gun Battery.

In 1782 renewed activity within the Spanish lines prompted Elliott to find new ideas from his garrison to counter the Spanish efforts. One such idea came from Warrant Officer Ince, who suggested mounting a gun battery on the notch, which was located half way up the North Face. In order to achieve this, tunnelling was commenced, and after mining approximately 15m an aperture was drilled to provide ventilation. It was then realized that these would make for excellent gun emplacements. Mining continued and the area below the notch was hollowed out allow-

ing for five guns, which together with Lieutenant Koehler's invention of the depressing gun proved successful in countering the Spanish offensive. This set of tunnels is now known as the Upper Galleries and constitutes one of the main tourist sites run by the Gibraltar Tourism Agency.

In the late 1700's, the Governor of Gibraltar, General Charles O'Hara had a tower built at the southern end of the ridge of the Rock in the belief that he should be able to see Spanish ships as they left the port of Cadiz. This proved a total failure, but the tower remained in place until 1888 when the captain of the HMS Wasp fired a shell through it. It was subsequently totally demolished in the 1900's and O'Hara's Battery with its 9.2-inch gun was established there.

Throughout the nineteenth century the Royal Engineers constantly strengthened and modernized the fortifications in Gibraltar, including those gun emplacements and batteries on the Upper Rock. Another two relics of this period, Healy's Mortar and the Lime Kiln on Willis's Road, can also be seen on the Upper Rock. Healy's Mortar can be found close to the Ape's Den. It was excavated from solid rock and was designed to propel over 1000 stones weighing 11b each to the enemy forces attacking Ragged Staff. After several trials, where many of the stones fell short and showered the town, it was decided to abandon the venture (Ellicott 1975).

7.5 World War II

In 1938, on the advent of WWII, the Governor of Gibraltar, General Sir Edmund Ironside began strengthening the Rock's defences, especially those facing north, against the possibility of a land-based attack (Jackson 1987). Naval guns were deployed at Princess Charlottes Battery and 9.2-inch guns around the southern end of the Rock to defend the Strait of Gibraltar. Anti-aircraft gun batteries and searchlight emplacements were also located all around the Upper Rock together with machine gun pill box emplacements to guard the batteries, and these included magazines and accommodation in the form of Nissen huts, usually inside tunnels, for the personnel manning these guns. The location of the main gun emplacements and other WWII buildings and constructions can be seen in Fig. 1.

- WWII fortifications and gun emplacements.
- 'Moorish' wall.
- Charles V Wall.
- Main roads.

Figure 1. Location of the main gun emplacements and other WWII buildings.

After the War, all the smaller guns and searchlights were dismantled. The large guns were left in place until the early 60's when the 9.2-inch gun at Jews' Gate Battery was removed. This was followed in the 1980's by the removal and transportation of the gun at Spur Battery to the Imperial War Museum in London. Levant Battery followed suit and was scrapped in the late 1980's. The three surviving 9.2-inch guns, O'Hara's, Lord Airey's and Spyglass, are all located close to the summit of the Rock. The Royal Gibraltar Regiment's artillery unit manned O'Hara's Battery until the late 1960's, when the gun was last fired. O'Hara's and Lord Airey's Batteries is now in the hands of the Gibraltar Tourist Board and has been opened regularly to tourists by special arrangement. The guns at Princess Caroline's Battery were left in place and this area has also been refurbished, but has remained out of bounds to the public for over a year now. The rest of the fortifications and historic remains do not form part of any management plan and many are deteriorating rapidly.

Serious thought must be given to all other WWII heritage, for some of this is in a poor condition. The



most significant areas where these other gun emplacements and WWII remains can be seen are along the walk up Mediterranean Steps, along Douglas Path and the area immediately south of the Cable Car top station. These three areas are the most frequented by visitors, locals and tourists and to say the least, the state in which they can be found is embarrassing (for recommendations see 8).

To begin with, the area to the south of the Cable Car Top Station is steeped in history. The 'Moorish' wall ends here, and there was possibly was some sort of lookout post or tower similar to that on Douglas Path. After this, in the 19th Century a signal tower was built to communicate with shipping, obviously on clear days. Finally, the military installed an anti aircraft gun battery on the site of the top station with ancillary buildings, smaller guns, accommodation and magazine on the adjacent area. All the tourists who venture on the Cable Car to the top of the Rock visit this area. What they find there is appalling. Although the contracted cleaning company cleans the access road, refuse litters the whole place, especially around the nooks and crannies surrounding the buildings and in particular on the east and west side slopes where people have thrown their rubbish. This is noticeable in the summer months when the vegetation dries and exposes the refuse, which unfortunately also coincides with the peak season for tourism. Recently, a chicken coop has been located there and chickens run about in plain sight of the tourists.

Douglas Path starts 30m up O' Hara's Road on the eastern side where Douglas Cave, after which the path is named, is located. The cave was mainly hollowed out and a shed is located



there. The Gibraltar Services Police refurbished this path in the late 1990's, after it had fallen into misuse and disrepair. They installed a railing to prevent access to 'spotters' (lookouts for tobacco and drug smugglers), on mopeds who littered the place, but this was soon dismantled and the place reverted back to its shameful state.

Figure 2. Railing dismantled at entrance to Douglas Path.

A few metres into the walk there is a small tunnel where accommodation and supplies were kept for the gun that was located outside. The path continues to wind its way north reaching a most magnificent set of gun emplacements with one facing west and the other east, the last accessed through the Rock. Both provide splendid views of the Bay and the eastern side respectively and on the whole the battery is in good condition with its original paintwork. Unfortunately spotters have frequently used this area and evidence of this can be seen in the accumulations of refuse and graffiti found in this place.

7.6 Water Catchments

As part of our recent heritage we consider it would be a good idea to preserve one of the water catchments in its natural state. This is not new for there was the intention of clearing the catchment area by the ticket office at Jews Gate precisely for that purpose. However, we feel that this catchment was developing a good cover of natural vegetation and moreover is relatively featureless and does not provide the same impact as the one a few metres further down the road. Here, the topography of the catchment, with the large rocky outcrops painted in white, displays better the efforts that were undertaken to provide water, and the adjacent lay-by provides ample parking for the tourists. Of course, ample information in the way of graphic panels would enhance this site and provide yet another example of our heritage to the visitors.

7.7 Recommendations

1) Details of remedial action and a management plan on the caves of Gibraltar are dealt with in Chapter 6.

2) The 'Moorish' wall is obscured from view by the dense vegetation that grows on either side of it. The vegetation could and should be cleared 30m either side of the wall, obviously taking due care and under supervision by supervisors who are knowledgeable in the Upper Rock's botany and habitats, thereby revealing the wall and at the same time providing a necessary fire-break in this densely vegetated part of the Upper Rock Nature Reserve. This will also reveal the small building just above the Charles V Road, with its interesting graffiti and the 'Moorish' archway on the wall by Ince's Farm. This graffiti should be protected by covering the walls in transparent perspex and information plaques should be provided on the 'Moorish' wall where this is

breached by one of the four roads that cut through it. In the same way the 'Moorish tower' on Douglas Path should be provided with an information plaque and be cleaned and restored. Access along the path, which is in a dangerous state, must be improved. Railings need replacing and the steps, many of which are crumbling away, must be repaired. The Moorish castle is at present undergoing restoration works.

3) Charles V Wall, a strong construction that has lasted over four hundred years, needs attention. The stairway running along the length of the wall has deteriorated due to constant use and exposure to the elements. Restoration works should commence using appropriate materials that will blend with the wall. The railings along some sections running up the stairway on the wall are missing and are loose in others. This was reported to the Tourist Board as far back as 2002 (Perez 2002). There is no point in disclaiming responsibility with a sign saying 'This staircase and handrail can be dangerous and unsafe. Use is entirely at your own risk'. The staircase and handrail have been unsafe for well over two years now and continue to be dangerous, yet nothing has been done to remedy this situation. There is a moral and legal obligation for the Tourist Board to maintain the condition of the Nature Reserve in an appropriate manner particularly when visitors are charged for entry, and principally when aspects of health and safety are involved. The railings must be replaced immediately and the steps closed to the public until such works commence.



Figure 3. Disclaimer at the top of Charles V Wall.

4) The firebreak along the north side of the wall is cleared annually of vegetation, revealing the full extent of this majestic wall. However, the southern side has grown very high, obscuring most it. This could also be removed to the same extent as the northern side. In addition, plants that can have a destructive effect on the structure of the wall, i.e., woody shrubs, should be removed from the wall itself. The information on the plaques along the wall should be extended to include more details as has been done on the plaque at the top of the wall.

5) The Upper Galleries remain the most significant heritage construction of the early British period. Thankfully, this site has been developed and maintained as a prime tourist attraction by the Gibraltar Tourist Board. It was refurbished in the 1990's by Sights Management and has since been improved upon. Yet the exterior of the site is in a pitiful state, with most of the concrete structure and viewing point suffering considerable deterioration. Accumulations of refuse can be seen

in the summer once the vegetation dries and exposes the same. The ticket office, which lacked an aesthetic appeal, has thankfully been considerably improved. The roadway at the top of this hill was subsiding and has finally being tackled by the Support Services, Highways Section. Unfortunately, the plans for the wall did not progress through the Development and Planning Commission (DPC), where they would have been reviewed by representatives from the Heritage Trust, GONHS and the Heritage and Planning Division. Due to a lack of consultation, a horrendous supporting wall has been built, that does not blend in with the character of the area or any other wall within the Upper Rock. Furthermore, it obstructs the view. It is understood that Government buildings and structures do not require the approval of the DPC. The authors consider that within the Nature Reserve every project should require the consideration of the DPC, including Government structures. Even then, the road still remains closed, since the area of the platform is relatively unsafe and will require extensive repairs. One would have thought that all works would have been carried out at the same time, thereby consolidating the work effort and reducing the disruptive effects to the tourism (see Chapter 20 on Tourist Sites).



Figure 4. The horrendous supporting wall on the approaches to the Upper Galleries.

relatively unsafe and will require extensive repairs. One would have thought that all works would have been carried out at the same time, thereby consolidating the work effort and reducing the disruptive effects to the tourism (see Chapter 20 on Tourist Sites).

6) Toilet facilities were non-existent at the northern end of the Rock and this was of particular concern especially for the workers at the ticket office and visitors to this site. This problem has finally been addressed by the Gibraltar Tourist Board.

7) The 'City Under Siege' exhibition on Willis's Road was heavily criticized during the summer of 2002. The displays were unkempt, with some of the models dirty and bleached by the sun, and the place was strewn with refuse. The site was subsequently closed, cleaned and refurbished. Sites on the Upper Rock should not be allowed to reach this state of neglect whereby adverse publicity from visitors and members of the public could result in a decrease of tourists, and a negative response from tour operators declining to visit Gibraltar on this basis.

8) Many of the batteries, gun emplacements, searchlight positions and other associated buildings of the WWII period are now covered with encroaching vegetation. Most of their structure is deteriorating and corroding, with a few in a dangerous state. Only two sites have received any attention, namely O'Hara's Battery and the combined Princess Caroline's and Princess Charlotte's Batteries. O'Hara's Battery, which until the late 1960's was manned by the Royal Gibraltar Regiment, has undergone several refurbishments. On one occasion this was carried out by a private company who planned to develop the site into a tourist attraction. This was then carried out again when the site was in the hands of Sights Management, and recently in 2002 by visiting military personnel, at the request of the Gibraltar Tourist Board, as part of their initiatives to help out with special local projects. This site offers spectacular views from the top of the Rock but is open to the elements and in particular the salt-laden winds and humid levanter cloud which regularly shroud the gun during easterlies. This has the effect of quickly corroding the metal around the gun with subsequent maintenance required periodically. Unfortunately this maintenance does not take place and the gun is deteriorating rapidly. The other two guns at Lord Airey's and Spyglass batteries have received no refurbishment at all and are therefore in a very poor condition, (see Fig. 5). The three heritage bodies, namely the Gibraltar Museum, the Gibraltar Heritage Trust and the Heritage and Planning Division should identify and create an inventory of all WWII heritage and then consider which of these structures merits restoration on the grounds of historical significance, and in particular cases, touristic value. In such cases a site or structure would benefit from sustainable tourism development programmes.



Figure 5. Lord Airey's Battery rusting away.



9) A serious consequence of the lack of wardening is the proliferation of paintings and graffiti that can be seen on most walls and historical heritage around the Rock. During the last refurbishment that took place in 2002, the military overlooked a huge graffiti display painted on the south facing concrete base of the gun. This is still there and can be seen in its full 'splendour' from the southern end of the Rock, especially Europa Point and from any passing cruise ship in the Strait. The management should remove this and other graffiti around the Nature Reserve.

Figure 6. O'Hara's Battery, sporting the largest graffiti that can be seen on the Upper Rock.

10) All that remains of Spur Battery is the gun emplacement and a few derelict buildings. The area affords magnificent views across the Strait and Gibraltar Bay but has been in a state of total abandonment and has suffered from constant vandalism with shocking graffiti, (see Chapter 5). In mid 2002 the Gibraltar Tourist Board enhanced this site and all the graffiti was painted over. In less than six months graffiti once again appeared on the walls at this site. There are at present no plans to develop this fabulous area, which is within easy reach of all tourists visiting the cave. The views from the walls surrounding the battery are spectacular, but access is difficult. The management should build a viewing platform that would better serve visitors until such time as a development plan for the area is formulated.



Figure 7. Spur Battery.
New graffiti a few months after the site was painted.

11) Levant Battery is in a similar state, but access to this site is difficult, hence the area has not suffered as much at the hands of vandals. This Battery, located further down than Spur Battery again affords wonderful views of the southern end of the Rock and the Straits and should therefore be developed and improved as one of the viewpoints for persons walking the Mediterranean Steps route.

12) The Princess Caroline's Battery, together with Princess Royal and Princess Anne's Batteries lie at the northern end of the Rock on one of the few level areas which exist in the Nature Reserve. It has therefore frequently been used as a picnic and recreational area by the local population, but has not formed part of a maintenance or management plan, with the resulting consequence of accumulations of refuse, together with vandalism and graffiti. A series of refurbishments to improve the area was attempted by the Gibraltar Tourist Board. This was to little avail, since shortly after the place resumed the ram-shackled state it was previously in. In an attempt to improve this situation the Gibraltar Tourist Board has embarked on a serious refurbishment programme, including the installation of CCTV cameras to curtail the acts of vandalism and graffiti. The site is at present closed to the general public and will be opened in due course once the development and management programme of the Lower Galleries, which will run in conjunction with these batteries, is completed (P. Canessa *pers. comm.*). We encourage this, but are concerned that delays will lead to more degeneration and vandalism, as is already the case.

13) The small area south of the Cable Car Top Station could be quickly refurbished with an anti aircraft gun, supplied with replicas of the paraphernalia of the period together with life-size models depicting the soldiers and equipment of the time. This, together with an interpretation centre detailing the historical heritage and natural history of this area, selling appropriate literature and souvenirs and converting the most southerly point into an observation platform would enhance this area and entice the tourists arriving on the Cable Car into the Nature Reserve.



14) The Douglas Path area should be cleaned, and should form part of the pathways management plan.

15) Information panels about the former role of the water catchment area on Engineer Road adjacent to the lay-by should be provided, instead of the incongruous welcome sign that is currently found there.

Figure 8. Engineer road water catchment should have a panel explaining the former role of this structure.

16) The Board of Management of the Upper Rock Nature Reserve should be ultimately responsible for the repairs, maintenance and cleaning of Historical Heritage in consultation with the Gibraltar Museum and the Heritage and Planning Division, or by the establishment of a committee, which would report back to the Board of Management, composed of persons with interest in the subject and related matters; i.e., Museum, Heritage Trust, Heritage and Planning Division, GONHS, Tourist Board, MOD. The committee should The committee should:

(a) develop a works programme to assess the condition of all historical structures on the Upper Rock Nature Reserve.

(b) with the development programme and management plan, to include reparation and periodic maintenance of all historical heritage, this programme to take into consideration the natural heritage of the area.

(c) to focus on ways of enhancing some of these historic sites and developing the same with tourism and in particular interpretation in mind.



Tower of Homage

References

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8. Introduced Flora

8. Introduced Flora

Of the 363 species of vascular plant that occur within the Upper Rock Nature Reserve in a wild state (Linares 2003), 24 species have been introduced from exotic environments. Many of these species were originally introduced from other parts of the former British Empire. Thus, for example, South African plants (which are native to an environment that is very similar to that of the Mediterranean) stand out. Many of these introduced species pose little or no threat to local flora; they have poor reproductive and dispersal abilities and find it difficult to establish local populations. However, a number of introduced species of plants are to be found on the Upper Rock in a wild state, i.e., with a regularly occurring, self-sustained population. Furthermore, a few of these species pose a very real threat to our local flora.

The 'Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations 1993' (L/N 52 of 1993) includes sections dealing with the introduction of faunal and floral species that are not indigenous to the Upper Rock. Section 5.(1)(h) of L/N 52 of 1993 states that it is illegal to 'introduce any animal or plant which is of a kind which is not ordinarily resident or is not a regular visitor to Gibraltar in a wild state or does not grow in the wild in Gibraltar, as the case may be'. Why then are introduced plants to be found within the Upper Rock Nature Reserve?

Firstly, many of these species had established populations within the Nature Reserve boundary prior to the 'Nature Conservation Area (Upper Rock) Designation Order 1993' (L/N 51 of 1993), when the Upper Rock was designated a Nature Reserve. Also, some populations of exotic flora within the Upper Rock have their origins in the gardens belonging to those people who live within the Nature Reserve. Even some of those species that were already established within the Upper Rock prior to its designation as a nature reserve have had their populations augmented by individuals spreading from gardens.

It is interesting to note that, whilst it is illegal to introduce a plant which is not found naturally on the Upper Rock into within the Reserve boundary¹, no legislation has been drafted to ensure that the introduction of exotic plant species to gardens belonging to houses within the Upper Rock is controlled, such as has been done in the case of animals, in section 5.(3) of L/N 52 of 1993. It is considered reasonable by the authors of this report for residents to plant exotics in their gardens, as long as they pose no threat to the local flora. However, more care should be taken with regard to what species are planted in the Gardens within the Nature Reserve, as, at present, there is no control over this whatsoever. Perhaps it would be wise to draft a list of potentially problematic species, and ban the growing of these in gardens within the Nature Reserve.

At present, there is also no legislation concerning the threat that activities in areas peripheral to the Upper Rock could pose to the Nature Reserve. This is rather worrying, given that some, or even most of the species that currently pose, or threaten to pose problems within the Nature Reserve have originated from houses or sites immediately outside the Nature Reserve boundary. This is the case for example with such species as *Lantana camara* and *Senecio angulatus*, as shall be seen further on. In light of this fact, legislation should be provided to ensure that a buffer zone exists around the boundary of the Upper Rock Nature Reserve, where the growing of certain species of garden plants is restricted.

Several introduced species that have become naturalised both within and around the Nature Reserve stand out, either because of their appearance or because they pose a serious threat to local flora (and by implication to local fauna as well) (GONHS 1994), or both. The table on the following page gives a brief account of some of these more prominent and/or problematic species, as well as an assessment of the problems that they may pose. After this, a more detailed account of each problematic species is given, including their identification and their distribution within the Nature Reserve, followed by an identification of 'problem areas' for exotic invasives within the Nature Reserve.

¹ L/N 51 of 1993. Section 5.(1)(h), pp.115.

Table 1. List of the most prominent introduced flora of the Upper Rock Nature Reserve, particularly those invasive species that pose a threat to local flora. A basic assessment of the threat that each species poses is given along with the account.

Species	Account	Threat
<i>Chasmanthe floribunda</i>	Bulbous annual. Grows in some open areas of Upper Rock. Dominates over indigenous species of open ground. Spreads to nearby areas.	P
<i>Carpobrotus acinaciformis</i> <i>x edulis</i>	Creeping succulent. Restricted range within Upper Rock. Poses severe threat to local species where it is widespread.	PP
<i>Ailanthus altissima</i>	Dangerously invasive tree found within PSA gardens. Spreads rapidly.	PP
<i>Senecio angulatus</i>	Creeping invasive that covers local trees and bushes. Large stands within and around Upper Rock. Spreads rapidly and dominates extensively.	VP
<i>Tecoma capensis</i>	A bushy creeper found in PSA and lower Rock gardens. Dominates over and covers local bushes, but does not spread rapidly.	SP
<i>Freesia refracta</i>	Small annual. Widespread within Upper Rock. Threat to local flora probably minimal.	NP
<i>Pelargonium inquinans</i>	Only found at a few sites within Upper Rock. Limited dispersal abilities. Poses minimal threat to local flora.	NP
<i>Opuntia ficus-indica</i>	Large succulent. A few stands exist within Upper Rock. Can form extensive stands that dominate over local flora. Similar <i>O. vulgaris</i> is far less common.	P
<i>Agave americana</i>	Large succulent. Spreads slowly to nearby areas, where can form relatively dense stands. Limited distribution within Upper Rock	SP
<i>Aloe arborescens</i>	Large succulent. Spreads slowly and vegetatively. Forms large stands that dominate over local flora. Localised within Upper Rock.	SP
<i>Oxalis pes-capre</i>	Small annual. Extremely widespread and common on Upper Rock, where naturalised. Almost spread to its full capacity. Initial effect unknown, but excludes native species.	P
<i>Plumbago auriculata</i>	A few bushes on Upper Rock, mainly around Upper Rock gardens and Jews' Gate. Limited dispersal abilities.	NP
<i>Lantana camara</i>	Small to sometimes large bush. Spreading into Upper Rock from peripheral gardens. Seeds spread by birds, giving it strong dispersal ability.	PP

Threat: NP = not problematic
 SP = slightly problematic
 PP = potentially problematic
 P = problematic
 VP = very problematic

8.1 *Senecio angulatus* L.



Figure 1. *Senecio angulatus* in flower.

Description

Commonly known as the Canary Creeper, this climbing perennial has flexible branched and twining hairless stems that can reach heights of over 10 metres on the shrubs and trees where it attaches itself. The leaves are broad and triangular, quite thick and succulent. The flowers, which are out from late November till the end of January, (with a less intense flowering also in June and early July), are 2 cm in diameter, bright yellow and form bunches of up to 12 together in the form of a disc (Cullen *et al.* 2000).

Range

Native to coastal regions of Natal in Southern Africa.

Locally this plant has been a favourite of many gardeners for its ability to cover extensive areas of walls and fencing. It can be found on the East Side of the Rock opposite the entrance to Catalan Bay where the house 'Rockfall' was situated. The plant is also found extensively from the north side of the Casino along the lower Rock all the way to just below Devil's Gap, and around the 'Royal Naval Hospital' at North Gorge.

Within the Upper Rock Nature Reserve this plant has spread from the residential area around Bruce's Farm and now covers an extensive area, which includes the northern part of the old PSA nursery and Upper Bruce's Farm. There is also a small stand above the entrance to St. Michael's Cave.

Threat

Very problematic. The species reproduces vegetatively producing numerous shoots that cover the ground and the surrounding vegetation, reducing the amount of light reaching other plants and thereby restricting and eliminating the competition. This plant is a very aggressive invasive species that has spread from nearby gardens in the Rock Hotel to cover large areas of the Lower



Figure 2. Map showing the distribution of *Senecio angulatus* within the Upper Rock Nature Reserve.

Rock. Here the plant has smothered large olive trees and other shrubs and has spread quickly. Large areas below Devil's Gap Battery have also been colonised with many of the disused chicken runs covered by the vines of the species.



Figure 3. *Senecio angulatus* smothering native wild olives (*Olea europea*) and surrounding shrubs.



Figure 4. *Senecio angulatus* has spread extensively behind the Rock Hotel and Casino area, threatening local flora.

This problem is also apparent on the Upper Rock where again the species has spread from the gardens along Lower Bruce's Farm, across the road to cover a large area of the old PSA nursery and Upper Bruce's Farm. The plant has also recently spread from the entrance to St. Michael's Cave covering just a small area to date.



Figure 5. *Senecio angulatus* has spread extensively within some parts of the Upper Rock.

Senecio angulatus produces large quantities of wind-blown seeds with a pappus of soft, feathery hairs. The seeds germinate readily within gardens, although it is unclear whether they do so in the wild (Cortes & Abrines 1994). However, a large quantity of seeds that were collected from both garden and wild locations during the winter of 2003 were planted at the Alameda Botanic Gardens and none of these germinated, signifying that the spread of this species through seed dispersal is probably minimal at the very most.

Action

This plant needs to be eliminated from all areas in Gibraltar as its invasive characteristic poses a threat to native species on the Rock. The peripheral areas along the Lower Rock pose a threat to the Upper Rock Nature Reserve for the spread of the species has been very rapid and the only barrier preventing the spread at the moment is the line of cliffs forming the perimeter to the Reserve. Volunteers of GONHS are already tackling the area in the old PSA nursery, but the area in question is extensive and will take many years to clear unless the pertinent authorities address the problem and a concerted effort is made to eliminate this and other potentially aggressive species from the Upper Rock Nature Reserve. The Bruce's Farm firebreak should be cleared annually as this would prevent the spread of the species, and the small patch by St. Michael's Cave should be cleared before the situation in this area gets out of hand. Furthermore, the planting of this species in gardens within the Nature Reserve should be prohibited.

8.2 *Chasmanthe floribunda* (Salisbury) Brown



Figure 6. *Chasmanthe floribunda* in flower.

Description

This bulbous, annual plant can grow up to a metre or more. It has long, tapering leaves, about 200mm to 650mm in length and 25mm to 55mm in width. The leaves have a conspicuous false midrib. Flowers are arranged in a spike of 20 to 30 orange-red flowers in two rows (Walters *et al.* 1986). The plant grows well in open areas, where it can form large stands.

Range

Chasmanthe floribunda is native to South Africa.

As with most of the plants in this chapter, *Chasmanthe floribunda* is a popular garden plant locally. Thus, it can be seen growing mainly in areas with gardens. It is common, for example, in some parts of the South District where plants have spread from private gardens, forming small populations.

Chasmanthe floribunda has a widespread distribution within the Upper Rock Nature Reserve. Populations are concentrated around areas where gardens exist, such as Bruce's farm, Ince's Farm and Tovey Cottage, but small stands of this plant can also be found at a distance from these areas. The largest stands occur on the firebreak immediately to the north of St. Michael's cave, where many individuals can be seen.



Figure 7. Map showing the distribution of *Chasmanthe floribunda* within the Upper Rock Nature Reserve.

Threat

Chasmanthe floribunda poses considerable problems within some parts of its local range. This plant spreads well from areas where it has been planted, and so stands can be found outside gardens throughout the Nature Reserve.

Figure 8. *Chasmanthe floribunda* spreads from gardens where it has been planted within and around the Upper Rock Nature Reserve. Here, it can be seen growing outside a garden in the Bruce's Farm residential area.



Judging by its dispersal abilities, *Chasmanthe floribunda* seems to produce fertile seeds that germinate well. Although most of the patches of this species within the Upper Rock are not large, some large, dense patches occur in open areas where this species has been able to spread easily. Nowhere is this more apparent than on the Firebreak to the north of St. Michael's cave, where extensive stands of this plant occur.

Chasmanthe floribunda seems to out-compete indigenous bulbous plants. This is evidenced by the exclusion of native flora, especially bulbous and rhizomatous species, in areas that have been colonised by this invasive species (Cortes & Abrines 1994). Given that this species can cover large areas, as shown by Fig. 9 and 10, the threat that it poses to local flora is very real.

Figure 9. The St. Michael's Cave firebreak holds impressive stands of *Chasmanthe floribunda*. This picture shows the extent of spread that has occurred below the road leading to the cave.



Figure 10. *Chasmanthe floribunda* growing on the firebreak, above the road leading to St. Michael's Cave.

Action

No action is currently being taken to eradicate this species from within the Nature Reserve. Given the threat that the spread of this species poses to local flora, measures should be taken to ensure that feral populations of this species within and around the Nature Reserve boundary are eliminated. This would involve clearing areas where this invasive species grows and uprooting the bulbs to ensure that stands of this plant cannot regenerate. It is also advisable to prohibit or restrict the growing of this plant in private gardens within the Nature Reserve.

8.3 *Lantana camara* L.



Figure 11. *Lantana camara* in flower.

Description

An evergreen shrub, about 1m to 2m, with a rounded appearance, often spreading. Stems are downy, often with small, recurved prickles. Leaves are bristly above and downy or hairless below. They have an oval shape, and are toothed. Flower heads are flattish, and the inflorescence consists of flowers of several colours, mainly white, yellow and pink (Cullen *et al.* 2000).

Range

Lantana camara is native to the West Indies, but it is widely naturalised in the tropics generally (Cullen *et al.* 2000).

In Gibraltar, *Lantana camara* is a popular garden plant. Large numbers can be seen, for example, in the Gardens of the South District. Individuals that have seeded from these gardens can also be found in this area, as they can in other areas where this species is grown.

It is from the gardens of the South District that this species has found its way into within the boundary of the Upper Rock Nature Reserve, in and around the Jews' Gate area, where a growing number of individuals of this species can be found. Large bushes of *Lantana camara* can also be found within the PSA nursery, where they were purposefully planted.



Figure 12. Map showing the distribution of *Lantana camara* within the Upper Rock Nature Reserve.



Figure 13. A large bush of *Lantana camara* growing within the PSA nursery, a site that holds an abundance of introduced flora.

Threat

Lantana camara is a noxious weed in Hawaii and many other areas in the tropics (Cullen *et al.* 2000). The planting of this species in gardens is discouraged in South Africa, due to its invasive ability (A. Abrines, *pers. comm.*).

In Gibraltar, *Lantana camara* has not caused any problems yet. However, seeds germinate readily (Cortes & Abrines 1994) and the species is spreading at an alarming rate in some parts of the Upper Rock, particularly below Jews' Gate where an increasing number of individuals are encountered. *Lantana camara* has the potential to spread extensively, given that it produces berries that are a favoured food-source of local birds, which probably play a role in seed dispersal. The reason that this species has not spread faster and more extensively is that it is likely that this species does not fare well during the summer drought.

Action

As with most invasive species, no action is currently being taken to control the spread of this species within the Nature Reserve. It is advisable to begin to clear and uproot individuals of the species whilst they have still not spread extensively, as this would both reduce the workload and avoid any adverse effect that *Lantana camara* may have on the local flora if it is allowed to spread.

8.4 *Opuntia ficus-indica* (L.) Miller

Figure 14. *Opuntia ficus-indica*, a cactus native to South America, has become naturalised on the Rock. Here it can be seen with *Senecio angulatus* and the native *Ephedra fragilis* outside a garden within the Upper Rock Nature Reserve.



Description

A fleshy, spiny, branching perennial that forms tree-like growths up to 3-4m in height. Branches consist of several joints or pads that are thick, green, flat and oval shaped. These are about 300-450mm long. This cactus produces fairly large, bright yellow flowers that are visible from June to July. The fruit of this plant is edible (Linares *et al.* 1996).

Range

Opuntia ficus-indica is a native of South America.

In Gibraltar, this species has become fully naturalised (Cortes & Abrines 1994). Most large stands of *Opuntia ficus-indica* are found outside the Upper Rock Nature Reserve, the largest population occurring in the Hole-in-the-wall area above Europa Advance Road. However, this plant is found at a number of locations within the Nature Reserve, primarily around areas with gardens such as Bruce's Farm, Ince's Farm and Devil's Gap. It is especially abundant on the cliffs of the western edge of the Nature Reserve.

Figure 15. Map showing the distribution of *Opuntia ficus-indica* within the Upper Rock Nature Reserve.



Threat

Opuntia ficus-indica is a popular garden plant, and it quickly spreads into surrounding areas. Where it forms large stands, this tough and dominating species quickly excludes local flora. Although its distribution is limited within the Nature Reserve, the several patches that occur seem to be spreading steadily. On the cliffs around the Devil's Gap area, this species is already extremely well established and widespread, as can be seen in Fig. 16.



Figure 16. Large stands of *Opuntia ficus-indica* occur on the cliffs of the western periphery of the Upper Rock Nature Reserve, where this species has become firmly established and poses a threat to local flora.

Opuntia ficus-indica already poses a threat to the indigenous plants of these cliffs. There is also a very real possibility that this species may spread into other areas in the lower reaches of the Nature Reserve, as it already seems to be doing at some sites.

Action

So far, no action has been taken to control the spread of this species within the Nature Reserve. Those stands that grow on the cliffs will no doubt prove very difficult to clear, given the inaccessibility of the sites at which they grow. However, in other more accessible areas where this species grows, a concerted effort to eradicate these populations should be made before this plant spreads more extensively, making its control more difficult.

8.5 *Carpobrotus acinaciformis x edulis*

Figure 17. *Carpobrotus acinaciformis x edulis*, a succulent creeper from South Africa, is found at a number of sites within Gibraltar, and it grows profusely at many of these sites. It was introduced into some of these areas to stabilise sand slopes.



Description

Carpobrotus acinaciformis x edulis is a stabilised hybrid of *Carpobrotus acinaciformis* (L.) Bolus and *Carpobrotus edulis* (L.) N.E. Br. that is unable to reproduce sexually (Ernst J. van Jaarsveld, *pers. comm.*). The plant has long stems of about 1.5m, with short lateral branches. The leaves are curved and green, and are broadest at or above the middle. Flowers are

up to 120mm in diameter, and petals are of a bright purple colour, or rarely yellow or white. *C. acinaciformis* grows with great vigour in sandy soil, and is commonly used to prevent erosion (van der Spuy 1971). This is also true of this hybrid.

Range

Carpobrotus acinaciformis and *C. edulis* are native to the Cape Province, South Africa.

In Gibraltar, this hybrid occurs mainly outside the Upper Rock Nature Reserve boundary. It has been grown primarily as a sand and scree stabiliser on the North Front, east sand slopes, Europa Advance Road, Europa Point and cliffs on the south west of the Rock, but it is also a garden escapee in various locations in the Upper Rock (Cortes & Abrines 1994, who give this plant as *Carpobrotus edulis*).



Figure 18. Map showing the distribution of *Carpobrotus acinaciformis x edulis* within the Upper Rock Nature Reserve.

Threat

At many sites outside the Nature Reserve boundary, *Carpobrotus acinaciformis x edulis* causes substantial problems to local flora. Once it has formed a reasonably sized patch, it quickly replaces and excludes local flora (Cortes & Abrines, 1994). This is evident, for example, on the east side sand slopes, where large stands of this plant occur. This can also be seen at Windmill Hill flats, where the only indigenous plant that grows through the dense mats that it forms is *Ephedra fragilis*. In fact, in an area of the Windmill Hill flats where a large stand of *Carpobrotus acinaciformis x edulis* was recently cleared, a large diversity of local flora can now be seen growing (*pers. obs.*).



Figure 19. *Carpobrotus acinaciformis x edulis* poses a severe threat to indigenous flora where it forms large stands. Here, it can be seen growing on slopes on the east side where it has been planted to stabilise scree and sand, and where much displacement of local flora has occurred.



Within the Nature Reserve, only two small patches of this species exist, and they do not signify a threat to indigenous flora at present. The patch at Princess Caroline's Battery is restricted by concrete surroundings and cannot spread any further, but the patch at Governor's Cottage could eventually cause problems if not tackled.

Figure 20. *Carpobrotus acinaciformis x edulis* within the Upper Rock Nature Reserve, at Princess Caroline's Battery.

Carpobrotus acinaciformis x edulis does not set seed, and so propagation is local by means of runners (Cortes & Abrines 1994).

Action

At present, *Carpobrotus acinaciformis x edulis* is only being removed by the MOD in the Windmill Hill flats area. Within the Upper Rock Nature Reserve, no action is being taken to control this problematic species. As previously mentioned *Carpobrotus acinaciformis x edulis* can only spread by means of runners. This is significant in that it cannot spread beyond the patch or mat that it forms. This, combined with the small amount of this plant growing within the Nature Reserve means that control is relatively easy.

Note

The identity of the species of *Carpobrotus* that grows on Gibraltar has long been subject to debate. Although initially identified as *C. acinaciformis* by Linares (L. Linares, *pers. comm.*), the species found on the Rock was later re-identified as *C. edulis* (see, e.g., Linares *et al.* 1996). The authors of this report found that most of the characters exhibited by the *Carpobrotus* spp. of Gibraltar correspond to those of *C. acinaciformis* according to Walters *et al.* (1989) and van der Spuy (1971), with only a few features being more similar to descriptions of *C. edulis*. However, Akeroyd (1994) argues that plants found in Gibraltar belong to *Carpobrotus edulis* L. var. *rubescens* Druce (a purple flowered variety), and that these are often mistaken for *C. acinaciformis*, which Akeroyd had never recorded in the Mediterranean (Akeroyd & Preston 1990). In fact, the identity of this plant has now been established. Ernst J. van Jaarsveld of the National Botanic Garden at Kirstenbosch in Cape Town, South Africa recognised this plant as a stabilised hybrid of these species, and commented that this plant is very vigorous and often causes problems as a weed.

8.6 *Oxalis pes-caprae* L.



Figure 21. *Oxalis pes-caprae* in flower.

Description

This plant is a bulbous, stemless perennial of about 200-400mm. The bulb has a vertical stem that rises to the soil surface, and this bears numerous stalkless bulbils. Leaves are numerous and consist of 3 heart-shaped leaflets. These are bright green, often with dark purple spots. Flowers consist of five petals, and are a deep golden-yellow colour (Cullen *et al.* 1997) although some are double-flowered.

The species only reproduces by bulbils in Europe, as only the short-styled variant was introduced to this region, and therefore fertile seed does not set (Cullen *et al.* 1997).

Range

Oxalis pes-caprae is a native of the Cape Province of South Africa.

In Gibraltar, this species is widespread and abundant, growing mainly in open ground (Linares *et al.* 1996). *Oxalis pes-caprae* is found growing throughout the Upper Rock Nature Reserve, and so a map showing its distribution has not been produced. However, its distribution is patchy, with some areas, such as for example the Rock Gun area having a far lower density of the species than other areas. The areas that are most affected seem to be roadsides and cliffs. On non-cliff habitats, *Oxalis pes-caprae* seems to do best in areas that have recently been disturbed by humans. Thus, the recent intensive clearing of roadsides seems to have caused a proliferation of this species in some areas.

This species seems to do particularly well in areas with little soil. Thus, it is often the first plant to be seen growing on cliffs and in areas of rocky debris, such as tunnelling deposits.

Figure 22. *Oxalis pes-caprae* grows well on walls.



Threat

Being a South African plant, *Oxalis pes-caprae* flowers between December and May (Linares *et al.* 1996). This means that when most local plants begin to flower, this species is already receding. However, this is not exclusively the case. Many local species of open areas flower before this period and competition between these species and *Oxalis pes-caprae* is inevitable. Furthermore, although *Oxalis pes-caprae* recedes in the spring, their bulbils remain in the soil, and it seems that many indigenous bulbous species, such as for example orchids may be excluded from areas where a high density of bulbils are present (Linares 1994).

The problems caused by *Oxalis pes-caprae* within the Nature Reserve are aggravated by the new way in which roadsides are being cleared. When roadsides are cleared vigorously, to the extent that even the soil in between rocky crevices is swept away (*pers. obs.*), *Oxalis pes-caprae* is the first plant to re-colonise the area, to the exclusion of native flora possibly from the odd bulbils that are left behind. Furthermore, the raking and stripping of roadside vegetation assists the distribution of bulbils into nearby areas.



Figure 23. *Oxalis pes-caprae* is particularly successful in areas that have been disturbed by humans, such as recently cleared roadsides, to the exclusion of indigenous flora.

Action

Currently, no action is being taken to control populations of *Oxalis pes-caprae* within the Upper Rock. The extent of its distribution within

the Upper Rock Nature Reserve means that populations of *Oxalis pes-caprae* cannot be eradicated or perhaps even reduced. However, a serious effort should be made to try to limit its spread. This would primarily involve a change in the way that roadsides are cleared. Local flora should not be pruned and trimmed as vigorously as it currently is, and soil should certainly not be swept away from these areas. The measures adopted to limit the spread of *Oxalis pes-caprae* require no extra costs, but rather a change in roadside clearing practice.

8.7 *Ailanthus altissima* (Miller) Swingle



Figure 24. *Ailanthus altissima* is a tall tree that is native to China.

Description

Ailanthus altissima is a narrow deciduous tree that can reach up to 20-30m in height. It has yellow-grey, deeply fissured bark. Leaves are about 450-600mm in length, and carry from 11 to 25 leaflets. The leaflets are lanceolate in shape and have two or three coarse teeth near the base. Flowers are white, and have small petals (Cullen *et al.* 1997).

Range

Ailanthus altissima is native to China.

In Gibraltar, this species is fully naturalised, having spread from gardens by means of suckers and seeds. It is particularly noticeable in and around the gardens

of the South District, but is also found in other areas, such as the sand slopes on the east side of the Rock (Cortes & Abrines 1994).

Within the Upper Rock Nature Reserve, *Ailanthus altissima* occurs in the PSA nursery, where the species is spreading mainly by means of suckers. This species also occurs in a part of the Mount garden that lies just outside of the Nature Reserve, and could easily spread into the southern lower Rock from here.

Figure 25. Map showing the distribution of *Ailanthus altissima* within the Upper Rock Nature Reserve.

Threat

Ailanthus altissima spreads quickly by means of suckers and seeds, and is an aggressive coloniser. Where it does spread, it excludes native trees, such as can be seen in the Mount Garden (Cortes & Abrines 1994). In the PSA garden, this species is spreading quickly, and could conceivably become the dominant tree in many parts of that garden. Furthermore, the danger of this species spreading to different areas of the Upper Rock is a very real one, particularly at sites with a considerable soil depth. Areas immediately surrounding the PSA nursery for example are particularly vulnerable.



Figure 26. *Ailanthus altissima* spreads by means of suckers and seeds. Here, suckers can be seen growing in the PSA nursery.



Gibraltar Neanderthals

Action

At the moment, no action is being taken to control the population of *Ailanthus altissima*, although a group of GONHS volunteers are discussing the possibility of tackling the problem. However, effective eradication of this species is difficult without the necessary resources to tackle the problem effectively. This species needs to be dug up in order to be eradicated effectively. There has been some success in reducing the problem in the Botanic Gardens at the Alameda. Mature trees have been cut and the stumps killed by treating with SBK. This has been followed by regular strimming any seedlings or new growth from surviving suckers and/or spraying these with glyphosphate. In any event, considerable man-power is needed if an effective eradication campaign is to be successful at both the PSA nursery and the Mount.

8.8 *Tecoma capensis* (Thunberg) Lindley

Figure 27. *Tecoma capensis* in flower.

**Description**

Tecoma capensis is a shrub or woody-based herb, sometimes climbing. Leaves consist of 7-11 leaflets arranged opposite to each other. Leaflets are elliptic or almost circular. The inflorescence consists of a raceme or raceme-like panicle. Corolla are 35-50mm, 6-7mm wide at mouth, tubular,

slightly curved, orange-red and mostly hairless. Lobes have marginal hairs. Fruit are 70-110mm x 7-12mm and slightly wrinkled (Cullen *et al.* 2000).

Range

Tecoma capensis is native to South Africa and southern Mozambique.

In Gibraltar, *Tecoma capensis* can be found growing in many gardens, particularly in the south district. Here, individuals sometimes propagate into areas immediately outside of gardens by means of runners (Cortes & Abrines 1994, where this species is given as *Tecoma capensis*). Within the Nature Reserve, *Tecoma capensis* grows mainly within and around gardens, such as in the Bruce's farm area, St. Michael's cabin and the Ince's Farm area. A stand also grows in the area below Jews' Gate, originating from adjacent gardens.

Figure 28. Map showing the distribution of *Tecoma capensis* within the Upper Rock Nature Reserve.

**Threat**

Seed setting in Gibraltar of *Tecoma capensis* is limited, and there is no evidence of successful germination in the wild (Cortes & Abrines 1994). Furthermore, propagation by means of runners only ever results in the extension of stands, and so there is no evidence of true naturalisation of this species in Gibraltar (Cortes & Abrines 1994). This species does not, therefore, pose a large threat to local flora. However, where stands do occur, they can quickly smother and cover native vegetation. This has occurred to a large extent, for example, at the PSA nursery (Wheeler, R., *pers. comm.*). Clearing of stands of *Tecoma capensis* that occur outside of gardens is therefore important.



Figure 29. A stand of *Tecoma capensis* growing within the Upper Rock Nature Reserve. Stands such as these often smother indigenous flora.

Action

Some stands of this species growing at the PSA nursery have been cleared by GONHS volunteers. Manpower is required to ensure that stands that occur outside gardens are cut back and eliminated. Garden owners should be responsible for ensuring that stands of this plant, or any other exotic, do not spread beyond the garden boundary.

8.9 Aloe arborescens Miller



Figure 30. *Aloe arborescens* in flower.

Description

Aloe arborescens is a succulent with stems of 2-3m, each bearing a rosette of leaves. Leaves are numerous on each rosette, widely spreading and curved downwards towards their apices. Leaves are 500-600 x 50-70mm, lanceolate, dull green and with pale, firm teeth on the margins. The inflorescence is usually simple, with flower stalks of 35-40mm and bracts of 15-20mm. The perianth of about 40mm is cylindrical, slightly constricted above the ovary and orange-red (Walters *et al.* 1986).

Range

Aloe arborescens is native to parts of southern Africa, from South Africa north to Malawi.

In Gibraltar, large stands of this species grow where they have been planted, such as in gardens, along Europa Advance Road and the east side. A few stands of *Aloe arborescens* occur within the Upper Rock. For example, there are several stands around Mediterranean Road, where the largest population occurs, and also around Bruce's and Ince's farms. The full range of *Aloe arborescens* within the Upper Rock can be seen on the map in Fig. 31.

Figure 31. Map showing the distribution of *Aloe arborescens* within the Upper Rock Nature Reserve.



Threat

In Gibraltar, *Aloe arborescens* does not set seed and does not spread to new sites by natural means (Cortes & Abrines 1994). Furthermore, most stands of this plant that are found within the Upper Rock Nature Reserve are small. This species does not, therefore pose a significant threat to local flora. However, in the areas where it does occur in large numbers, *Aloe arborescens* forms very dense stands that exclude native flora.

Action

Since this species does not cause problems within the Upper Rock Nature Reserve, no real action needs to be taken against it. However, vigilance is necessary to ensure that stands of this plant do not increase in size dramatically. *Aloe arborescens* incurs no costs, as control of this species within the Nature Reserve is not necessary at this stage.

8.10 *Agave americana* L.



Figure 32. *Agave americana* in flower.

Description

Succulent with a large, trunkless rosette of 2-3m in diameter with 20-60 leaves. Produces suckers. Leaves of about 1-2m x 150-300mm, narrowed towards base, rigidly spreading or reflexed towards the apex. Leaves are smooth and leathery, with toothed margins. Marginal spines are about 8mm in length, curved and blackish brown, later turning to grey. Terminal spine of leaf 30-50mm. Floral spike or panicle of 5-8m, slender with 25-30 branches. Pale yellow flowers of 70-100mm (Walters *et al.* 1986).

Range

Agave americana is native to Mexico, but is widely naturalised elsewhere, including the Mediterranean.

This species has become naturalised in Gibraltar, and is a feature of open areas such as the east side and Europa Foreshore (Cortes & Abrines 1994). Within the Nature Reserve, *Agave americana* grows mainly below the Queen's lookout, with some scattered individuals

elsewhere, and so a map of its distribution has not been produced. The stand that grows at this site seems to be spreading slowly.



Figure 33. *Agave americana* growing within the Upper Rock Nature Reserve, below the Queen's lookout.

Threat

In Gibraltar, *Agave americana* reproduces by means of plantlets developing on flower spikes (Cortes & Abrines 1994) and also seems to produce suckers. Although the possibility that this species might exclude indigenous flora where it grows is a very real one, only very small numbers occur within the Nature Reserve, and the impact on local flora is therefore minimal.

Action

Since *Agave americana* does not cause significant problems at present, little action is necessary against this species within the Nature Reserve. The small stands that currently exist should be eliminated.

Cost

At present, *Agave americana* incurs no costs.

In addition to the plants described above, other introduced species also occur. However, these are not as problematic as those listed above. Examples include *Dracaena draco*, *Pelargonium inquinans*, *Freesia refracta* and *Plumbago auriculata*. There are also several species of exotic invasive that cause problems in other parts of Gibraltar but are not found (or are very rare) within the Upper Rock Nature Reserve. Two of these in particular stand out, as they are both found immediately outside the boundary of the Nature Reserve. The first of these is the Australian tree *Acacia cyanophylla*, which, together with *Acacia retinoides* has caused considerable trouble on the east side sand slopes, where large stands of these *Acacia* occur. *Acacia cyanophylla* can also be found growing elsewhere in Gibraltar, including along the upper reaches of Windmill Hill, from where this species could easily spread into the Jews' Gate area of the Upper Rock Nature Reserve. Two individuals of this species are also found in the PSA nursery, from where it could also spread into neighbouring areas.

The second invasive species that could pose problems in the future is the East African grass *Pennisetum clandestinum*, also known as 'Kikuyu grass'. This is an aggressive species that forms dense mats, smothering and excluding indigenous flora. It also releases allelopathic chemicals that kill most plants. This can be seen for example on Windmill Hill Flats, where a huge mat has formed at the northern end of the flats, excluding practically all local flora. Another large stand of *Pennisetum clandestinum* occurs along the lower reaches

of Engineer Road, where again all indigenous flora is being smothered. This stand of *Pennisetum clandestinum* poses an immediate threat to the flora of the Upper Rock Nature Reserve, given that it presently grows at only about 100m from the southern entrance of the Nature Reserve, and is rapidly spreading.

Although not found within the Nature Reserve yet, individuals or populations of potentially invasive species such as *Pennisetum clandestinum* and *Acacia cyanophylla* that lie within close proximity of the Upper Rock Nature Reserve should be tackled and eradicated as part of an Upper Rock management plan. This would ensure that invasion of the Nature Reserve by these exotic species does not occur.

8.11 Problem Areas

Although some of the exotic, invasive plant species found on the Upper Rock have quite a widespread range within the Nature Reserve, it is evident from the distribution maps that most are concentrated in similar areas, and that some sites within the Nature Reserve can be identified as 'problem areas'. These can be seen on the map of the Upper Rock in Fig. 34.



Figure 34. Map showing the distribution of all invasives on the Upper Rock. Some of the more prominent non-invasive exotics have been included as well.

As can be seen on the map, there are four main 'problem areas' for exotic plants within the Upper Rock. These are the Bruce's farm area, the Ince's farm area, the Jews' Gate and Mount area, and the St. Michael's cave area. These sites are all discussed next.

8.11.2 Bruce's farm



Figure 35. Map showing the density of exotic invasives growing in the Bruce's Farm area, which is contained in the black box.

This area, which includes a number of houses with gardens as well as the PSA nursery, is the area that is most badly affected by exotic invasives in the Upper Rock. *Chasmanthe floribunda*, *Aloe arborescens*, *Lantana camara*, *Oxalis pes-caprae*, *Ailanthus altissima*, *Senecio angulatus*, *Tecoma capensis* and *Opuntia ficus-indica* all occur within the Bruce's Farm area. Additionally, *Freesia refracta*, *Pelargonium inquinans* and *Plumbago auriculata* also occur. It is clear that the problem that this area faces with regard to exotic invasive flora comes as a result of these species having been grown within gardens in the residential area and in the PSA nursery.

8.11.3 Ince's Farm



Figure 36. Map showing the density of exotic invasives in the Ince's Farm area, which is surrounded by the black box.

Ince's Farm has almost as high a density of exotic invasives as the Bruce's Farm area, with *Chasmanthe floribunda*, *Aloe arborescens*, *Lantana camara*, *Oxalis pes-caprae*, *Senecio angulatus*, *Tecoma capensis* and *Opuntia ficus-indica* all occurring. These occur around the fringes of the gardens, and many of these species have now established populations around these gardens. Particularly noticeable are the stands of *Senecio angulatus* and *Opuntia ficus-indica* that occur on the opposite side of the road to Ince's Farm and further down towards Devil's Gap. In fact, the largest population of *Opuntia ficus-indica* occurs in this area; the cliffs below harbour large stands of this species.

8.11.4 Jew's Gate & The Mount



Figure 37. Map showing the density of exotic invasives in the Jews' Gate and Mount area, which is surrounded by the black box.

The exotic invasives that occur in this area are *Chasmanthe floribunda*, *Aloe arborescens*, *Carpobrotus acinaciformis x edulis*, *Lantana camara* and *Oxalis pes-caprae*. *Aloe arborescens* and *Carpobrotus acinaciformis x edulis* occur below the Governor's Cottage, having probably been planted there to stabilise the scree slope. *Chasmanthe floribunda* and *Lantana camara* have spread into the area from the gardens of the Mount and from the garden at the Jews' Gate Field Centre, where a stand has been established for more than twelve years. *Plumbago auriculata* and *Freesia refracta* also occur at this site.

8.11.5 St. Michael's Cave area



Figure 38. Map showing the density of exotic invasives growing in the St. Michael's Cave area, which is surrounded by the black box.

The St. Michael's Cave area, which includes the adjacent firebreak, harbours an array of exotic invasives. The largest stands of *Chasmanthe floribunda* found within the Nature Reserve (or in Gibraltar, for that matter) grow on this firebreak. These have spread to the extent that large parts of the firebreak are now dominated by this species, to the exclusion of local flora. *Senecio angulatus* and *Tecoma capensis* were planted in the small garden behind the cabin, and stands of this species have grown larger and are beginning to spread into adjacent areas. The exotic *Freesia refracta* also occurs.

8.12 Proposed list of exotic plant species that should not be grown in gardens within the Nature Reserve

As can be seen, the areas within the Upper Rock Nature Reserve that have the gravest problem with exotic invasives all include gardens within them, from which these plants spread. It therefore seems logical that the most effective way to control the further spread of exotic invasives within the Upper Rock would be to ban the growing of certain problematic species, particularly those with a high potential for seed dispersal (such as bird or wind dispersed seeds). The authors of this report advise that legislation be put in place to prohibit the growing or keeping of the following exotic plant species in gardens and homes within the Nature Reserve (and within a buffer zone surrounding the Nature Reserve), as these species pose a substantial threat to local flora when feral populations are established:

Pennisetum clandestinum Chiov. ex. Hochst.
Senecio angulatus de Candolle
Chasmanthe floribunda (Salisbury) Brown
Ailanthus altissima (Miller) Swingle
Carpobrotus acinaciformis (L.) Bolus
Carpobrotus acinaciformis x edulis
Carpobrotus edulis (L.) N.E. Br.
Opuntia ficus-indica (L.) Miller
Lantana camara L.

In addition, the management of the Nature Reserve, in conjunction with the Town Planner, should give serious consideration to the implementation of a policy of not allowing garden types or garden plants that are out of character with the rest of the Nature Reserve, particularly when these gardens are visible to those who visit the Upper Rock. It is the authors' opinion, for example, that a garden consisting solely of succulents, attractive as it may look in itself, does very little for the overall aesthetic appeal of the Nature Reserve. Those who enter the Upper Rock are after all visiting a Mediterranean nature reserve and not one in the Sonora or Somali deserts. However, it is recognised that defining a policy regarding the definition of a garden that is deemed to be 'in character' with the Nature Reserve may be problematic, but a discretionary policy (perhaps enforced by the Town Planner) may be a good idea, providing that it is carried out fairly, of course.

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9. Pine Trees

9. Pine Trees

An edited version of this chapter was submitted to the 'Almoraima', the Journal of the Instituto de Estudios Campo-gibraltareses where it appears as Bensusan & Perez (2004).

9.1 Introduction

Two species of pine tree occur on the Upper Rock, both introduced to Gibraltar but probably native to nearby Spain. These are *Pinus pinea* L. (stone pine) and *Pinus halepensis* Miller (Aleppo pine). *P. pinea* is a tall tree that reaches up to 30m in height. It usually has a straight trunk, with an umbrella-shaped canopy, and can most easily be told from *P. halepensis* by its reddish bark with large scales and its rounded cones. *P. halepensis* is generally a smaller tree, reaching about 20m in height, has elongated cones, lacks the large scales of *P. pinea* on its bark and often has twisted branches and trunk (Linares *et al.* 1996). *P. pinea* is a native of light sandy soils in and around the Mediterranean, such as coastal areas, and is the most common pine in the Campo de Gibraltar, where several woods of this species occur. *P. halepensis* is also native to the Mediterranean and is particularly drought resistant (Humpries *et al.* 1981). Photographs showing key features in the identification of both species are shown in Fig. 1 & 2.



Figure 1. *Pinus halepensis*. The photograph on the left shows the structure of a typical individual of this species, whilst that on the right illustrates its elongated cones.



Figure 2. *Pinus pinea*. A tree belonging to this species can be seen on the left. Its umbrella-shaped canopy is a diagnostic feature. The photograph on the right shows this species' rounded cones, a feature that distinguishes it from *P. halepensis* (Photo by L. Linares/GONHS).

Pine trees were originally planted on the Upper Rock by the garrison, and as such, pines are found mainly on roadsides and pathways. We therefore attempted to investigate the age of the trees by searching through Gibraltar Directories, from the 1880s to the 1930s. Although the exact dates when these trees were planted could not be found, Wolley-Dod (1914) mentions that '...in recent years a considerable number of pines and other trees have been planted on the western slopes.' Growth rings were counted on a number of individuals that had been sawed down once dead, and this did indeed show that most pines on the Upper Rock are between 80 and 100 years old. Those whose rings were counted ranged between 84 and 98 years old. Therefore, most pines were probably planted on the Upper Rock some time between the 1900s and the 1920s.

A severe drought occurred in the 1990's, from 1993 to 1996. Table 1 shows total annual rainfall data for Gibraltar from 1988 to 2002.

Table 1. Total annual rainfall in mm for Gibraltar from 1988 to 2002. Total rainfall for each month is also given (data provided by the Gibraltar Met Office).

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
January	70	191	136	61	18	71	55	28	482	212	75	70	111	107	24
February	54	101	0	95	111	102	83	36	57	0	160	40	0	48	112
March	26	22	90	118	42	204	2	21	130	4	54	77	20	1	94
April	23	50	132	64	49	100	58	28	123	24	22	33	145	79	67
May	19	42	10	3	3	58	23	10	80	39	27	10	43	21	22
June	15	1	2	4	147	1	2	27	5	5	4	0	0	1	13
July	8	0	0	0	1	0	1	1	0	2	0	1	0	0	0
August	0	0	0	3	0	5	0	0	1	1	0	0	0	0	0
September	13	15	5	56	15	22	18	9	25	30	30	27	9	39	22
October	102	102	76	195	142	158	49	1	58	70	1	149	86	72	204
November	263	369	55	66	11	143	62	97	161	230	2	43	90	55	260
December	0	556	292	145	112	7	4	357	652	182	64	35	287	306	133
Total	594	1448	799	810	650	869	358	613	1774	799	440	485	791	730	952

As can be seen, rainfall from the end of 1993 to the end of 1995 was extremely low. This is illustrated on the graph in Fig. 2.

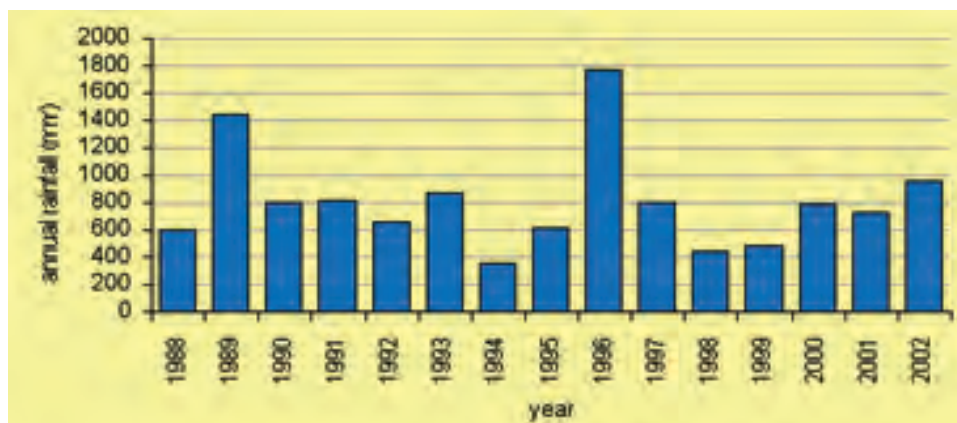
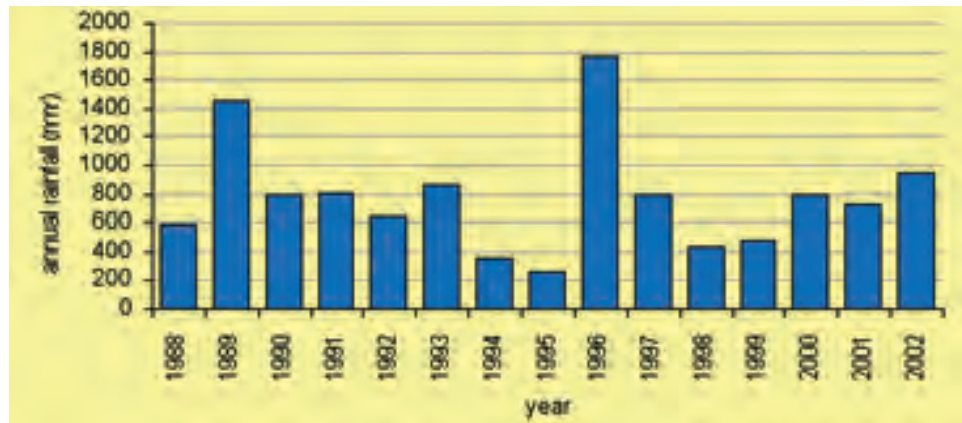


Figure 2. Annual rainfall in Gibraltar, from 1988 to 2002.

During the drought period, the pine tree population of the Upper Rock seems to have suffered dramatically from a lack of water, to the extent that a large number of trees died. As can be seen, 1994 was an exceptionally dry year. There was also a two year period of exceptionally low rainfall during 1998 and 1999, but this seems to have had less of an impact on the pine population of the Upper Rock, given that most of the trees that are found dead today were already dead or dying by then due to the earlier drought (*pers. obs.*). 1995 does not seem, from the bar chart, to have been as dry a year as would be expected during a drought. However, an inspection of the data in table 1 will show that most of the rain recorded during 1995 fell in December, and that month for month 1995 was an even dryer year than 1994. In fact, the data on table 1 shows that the drought began during December 1993 and ended at December 1995, lasting exactly two years. Therefore, in order to show the two-year drought more effectively in Fig. 3, we have changed December 1995's rainfall data for that of 1993, and vice-versa.

Figure 3. Annual rainfall in Gibraltar, from 1988 to 2002. The December rainfall data of 1993 and 1995 have been switched to show the two-year drought period more effectively.



It is evident, when the drought period is correlated to the period during which many trees died that these pines probably did not survive due to the 1993-1996 drought. In discussing this, we considered that the drought may have affected our two pine species differently, and that rates of mortality may differ spatially. With this in mind, we decided to investigate pine tree mortality and distribution on the Upper Rock.

9.2 Methods

Since pine trees are distributed mainly along roadsides and pathways and are clearly visible from a distance, trees were observed and counted by walking along the roads and paths of the Upper Rock, and individual pine trees were recorded on maps. Trees were given a score according to the state or 'health' of their canopy by recording an approximate percentage of foliage cover. The scores given are as follows; 0 = dead, 1 = <15% foliage cover of canopy, 2 = 16 – 30% foliage cover, 3 = 31 – 50% foliage cover, 4 = 51 – 69% foliage cover and 5 = 70%+ foliage cover. Once data were collected, several analyses were carried out. These are listed below:

- Maps were produced to show the distribution of both all of the pine trees counted, and live trees alone.

- Proportions of live and dead pine trees were investigated as percentages.

- Since two species of pine tree are found within the Upper Rock, a chi-square test for differences was used to investigate whether there is a significant statistical difference in the number of individuals that remain alive of each species. Due to our small sample size (with 1 *d.f.*), Yates's correction was applied to the chi-square test.

- The Upper Rock Nature Reserve was divided into eleven separate areas for the purposes of this study, and pine tree mortality was investigated within each individual site. Three types of analysis were carried out; between-species differences in survivorship, differences in the survivorship of pine trees in the area compared to the Upper Rock as a whole and differences in the survivorship of each species compared to the Upper Rock as a whole. Chi-square tests for differences were again used in these analyses. Many of our chi-square tests gave a probability (*p*) value of >0.05. It is customary in such a situation, where more than one test has been carried out, to alter *p* values according to the number of tests used, as the probability of arriving at a figure at random increases with every test. This would render some of our χ^2 values insignificant. However, since sample sizes were very small in most cases, it was decided to consider any χ^2 value with a *p* value of <0.05 significant for the purposes of our analysis.

- Using the 1-5 fitness scores given to live pine trees, the 'fitness' of those pine trees remaining alive was investigated by calculating the number of individuals that fall into each score as a percentage of the total number of live pine trees left within the Nature Reserve.

- Using the number of individuals recorded in each 'fitness' category, chi-square tests for differences were used to ascertain whether there is, a) a difference between fitness levels recorded for each species and, b) whether this difference remains once dead individuals are eliminated from the analysis.

- In order to illustrate the changing nature of the western slope of the Upper Rock from north to south, and relate this to spatial differences in tree mortality, six west-east intersections of the Rock of Gibraltar were produced and the angle of the slope measured at each one.

9.3 Results

The results obtained from the analyses described above are given next.

9.3.1 How many pine trees remain alive within the Upper Rock Nature Reserve?

A total of 307 trees of both species were counted within the Upper Rock Nature Reserve, 108 *P. halepensis* and 199 *P. pinea*. Of these, 113 individuals were alive whilst 194 were dead. This means that 63.2% of pine trees found within the Nature Reserve are dead, with only 36.8% alive. This is best illustrated in Fig. 4, which shows a map of all pine trees found on the Upper Rock (including dead individuals) and another map showing the distribution of live pine trees only on the Upper Rock.

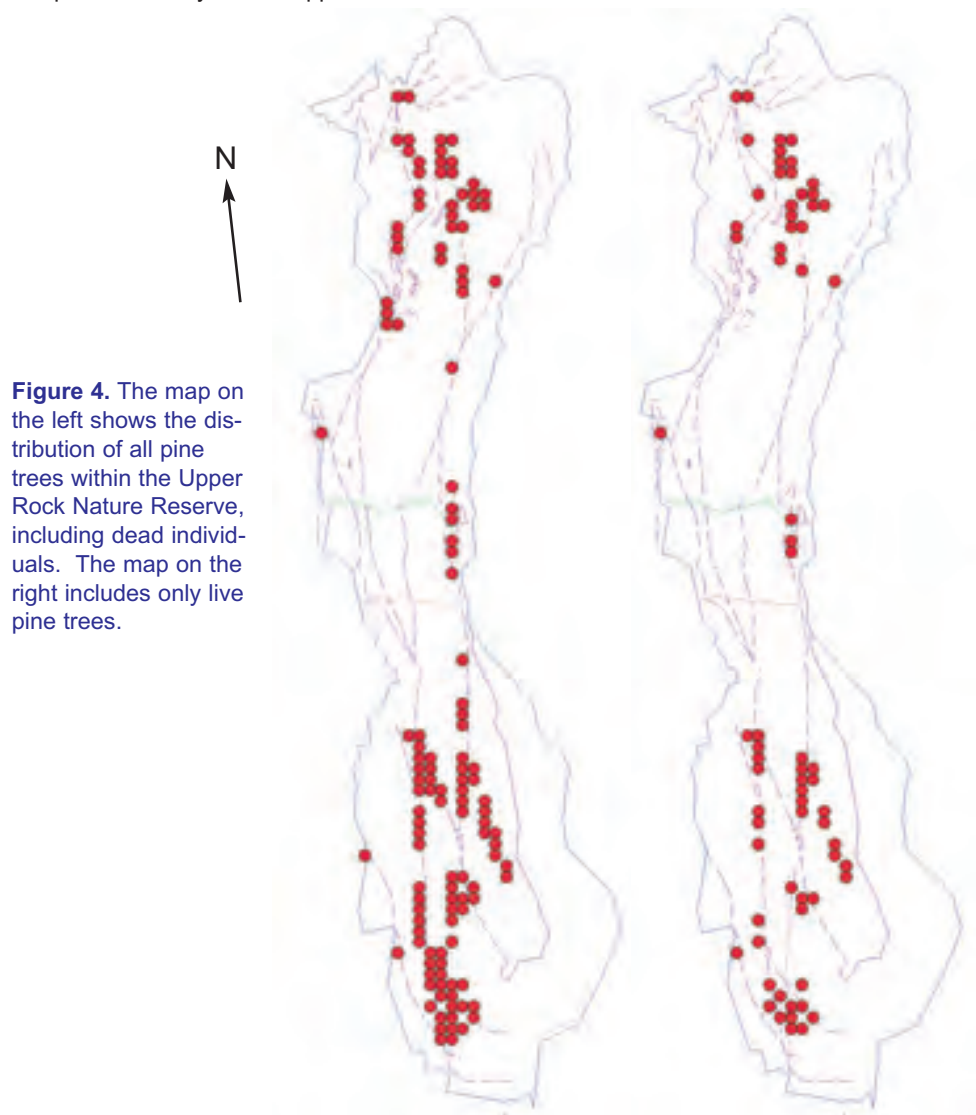


Figure 4. The map on the left shows the distribution of all pine trees within the Upper Rock Nature Reserve, including dead individuals. The map on the right includes only live pine trees.



Figure 5. Many of the pine trees found on the Upper Rock died during the drought of 1994-1996. Shown are some dead stone pines *Pinus pinea*, along Mediterranean Road.

9.3.2 Differences between the survivorship of *Pinus pinea* L. and *Pinus halepensis* Miller

The proportions of dead and live trees differ from species to species. Of the 108 *P. halepensis* counted, 59 were alive and 49 were dead, i.e., 54.6% are alive whilst 45.4% are dead. This contrasts sharply with *P. pinea*. Of the 199 individuals of this species counted, 54 were alive and 145 were dead, i.e., 27.1% are alive whilst 72.9% are dead. There is a marked difference in the probability of survival of both species, with *P. halepensis* having a significantly higher survivorship ($\chi^2 = 21.58$, $d.f. = 1$, $p = <0.001$).

9.3.3 Does pine tree mortality differ spatially?

Different areas of the Upper Rock showed differences in the proportion of pine trees dying, and indeed in the proportion of each species dying. The Upper Rock was divided into 11 separate areas for the purposes of this study. Table 2 shows all of our results.

Table 2. Number of *Pinus halepensis* and *Pinus pinea* found within the Upper Rock. Results have been divided up into 11 separate areas, and we have also recorded whether the trees are alive or dead.

Site	Pinus halepensis		Pinus pinea		Total		Total
	Live	Dead	Live	Dead	Live	Dead	
Martin's Path	6	7	0	15	6	22	28
Mediterranean Road	3	1	1	22	4	23	27
Queen's Road	9	2	8	41	17	43	60
Cave Branch Road	9	20	0	0	9	20	29
O' Hara's Road	5	4	7	12	12	16	28
St. Michael's Rd (Lower)	6	9	2	8	8	17	25
St. Michael's Rd (Upper)	0	3	0	10	0	13	13
Spur Battery Road	2	0	1	10	3	10	13
Signal Station Road	5	0	29	17	34	17	51
Cable Car Area	0	0	2	4	2	4	6
Governor's Lookout	14	3	4	6	18	9	27
Total	59	49	54	145	113	194	307

P. halepensis showed a higher survivorship than *P. pinea* in most cases, and at no site did *P. pinea* show a significantly higher rate of survival than *P. halepensis*. Our findings on each area are given below:

- Martin's Path – Pine trees in this area showed no significant difference to the overall proportion of trees found alive ($\chi^2 = 2.02$, $d.f. = 1$, $p = >0.05$). Survivorship of *P. pinea* is significantly lower than average along Martin's Path ($\chi^2 = 4.10$, $d.f. = 1$, $p = <0.05$).

- Mediterranean Road – With only 4.3% of *Pinus pinea* surviving, the survivorship of this species is significantly lower along this road than within the Upper Rock as a whole ($\chi^2 = 4.59$, $d.f. = 1$, $p = <0.05$). At 14.8%, a significantly lower proportion of both species of pine tree have survived along Mediterranean road than in the whole of the Upper Rock ($\chi^2 = 4.35$, $d.f. = 1$, $p = <0.05$).

- Queen's Road – Survivorship of both species combined along Queen's road does not differ significantly from that of the Upper Rock as a whole ($\chi^2 = 1.23$, $d.f. = 1$, $p = >0.05$).

- Cave Branch Road – Only individuals of *Pinus halepensis* were found along this road, a lower proportion of which remain alive (at 31%) when compared to the whole of the Upper Rock ($\chi^2 = 4.19$, $d.f. = 1$, $p = <0.05$).

- O'Hara's Road – Survivorship of both species does not differ from that of the Upper Rock ($\chi^2 = 0.18$, $d.f. = 1$, $p = >0.05$).

- St. Michael's Road (Lower) – There is no significant difference between the proportion of trees found dead along this road and that of the Upper Rock as a whole ($\chi^2 = 0.38$, $d.f. = 1$, $p = >0.05$).

- St. Michael's Road (Upper) – All of the pine trees found along this stretch of road were dead. It is therefore no surprise that the proportion of dead trees along this road (at 100%) is significantly higher than that of the Upper Rock as a whole ($\chi^2 = 5.87$, $d.f. = 1$, $p = <0.05$).

• Spur Battery Road – The proportion of trees of both species found dead along this road did not differ significantly from the proportion found within the Upper Rock ($\chi^2 = 0.51$, $d.f. = 1$, $p = >0.05$).

• Signal Station Road – at 63%, a much higher proportion of *Pinus pinea* remain alive along this road than within the Upper Rock as a whole ($\chi^2 = 19.93$, $d.f. = 1$, $p = <0.001$). The proportion of both species that remain alive is also much higher than within the whole of the Upper Rock, at 66.7% ($\chi^2 = 14.9$, $d.f. = 1$, $p = <0.001$).

• Cable Car Area – only individuals of *Pinus pinea* were observed along this part of the Upper Rock, a similar proportion of which remained alive to the rest of the Upper Rock ($\chi^2 = 0.02$, $d.f. = 1$, $p = >0.05$).

• Governor's Lookout – at 66.7%, a much higher proportion of pine trees survived around Governor's Lookout than within the whole of the Upper Rock ($\chi^2 = 8.07$, $d.f. = 1$, $p = <0.01$).

We can arrive at some conclusions from these findings, and these are given later.

9.3.4 Pine tree 'fitness' within the Upper Rock Nature Reserve

Although 36.8% of pine trees within the Nature Reserve remain alive, not all of these are in a healthy condition. From the individuals that remain alive, the following fitness scores were recorded: 1 = 6 (5.3%), 2 = 40 (35.4%), 3 = 38 (33.6%), 4 = 24 (21.2%), 5 = 5 (4.4%). As can be seen, only 4.4% of pine trees achieved the highest score, and 74.3% were deemed to have a canopy foliage cover of less than 50%. This means, in fact, that many of the pine trees that remain alive within the Nature Reserve are not in a good condition, and extremely few are in prime condition. However, does 'fitness' (as measured by our 0-5 scale) differ between the two species found within the Nature Reserve? Table 3 gives scores recorded for both species at each of the eleven sites, together with the totals.

Table 3. Pine tree 'fitness' scores (as given in the methods section) within 11 separate areas of the Upper Rock Nature Reserve, together with overall scores for the whole of the Nature Reserve.

Site	P. halepensis						P. pinea					
	0	1	2	3	4	5	0	1	2	3	4	5
Martin's Path	7	0	2	2	2	0	15	0	0	0	0	0
Mediterranean Road	1	0	0	1	2	0	22	0	1	0	0	0
Queen's Road	2	0	1	6	2	0	41	1	4	3	0	0
Cave Branch Road	20	1	4	3	1	0	0	0	0	0	0	0
O' Hara's Road	4	0	1	3	1	0	12	2	3	2	0	0
St. Michael's Rd (Lower)	9	1	1	2	2	0	8	0	1	1	0	0
St. Michael's Rd (Upper)	3	0	0	0	0	0	10	0	0	0	0	0
Spur Battery Road	0	0	0	0	2	0	10	0	0	1	0	0
Signal Station Road	0	0	2	0	2	1	17	1	5	9	10	4
Cable Car Area	0	0	0	0	0	0	4	0	0	2	0	0
Governor's Lookout	3	0	14	0	0	0	6	0	1	3	0	0
Total	49	2	25	17	14	1	155	4	15	21	10	4

Using species totals, a chi-square test showed that there is a significant difference between the distributions of individuals of both species across our 'fitness' scores ($\chi^2 = 18.00$, $d.f. = 5$, $p = <0.01$). However, it is plain to see when looking at the number of individuals under each 'fitness' score that the largest discrepancy between both species occurs at the number of individuals that are dead (45.4% of *P. halepensis*, 72.9% of *P. pinea*). This first chi-square test was probably, therefore, skewed by this large discrepancy between the number of individuals in the '0' category, and may tell us little about differences in live tree 'fitness' between both species. With this in mind, a second chi-square test was carried discarding the '0' category. This showed that there is no significant difference between the fitness of live populations of *P. halepensis* and *P. pinea* ($\chi^2 = 0.55$, $d.f. = 4$, $p = >0.05$).

9.3.5 The western slope of the Upper Rock Nature Reserve

The angle of the western slope of the Upper Rock, that which constitutes the Upper Rock Nature Reserve, changes from south to north. The southern slopes are extremely steep, but these become progressively less steep as we move towards the northern end of the Nature Reserve. Six diagrams of cross-sections of the Upper Rock show the changing angle of the slope from north to south. These correspond roughly to our eleven sites, and are shown in Fig. 5 & 6.

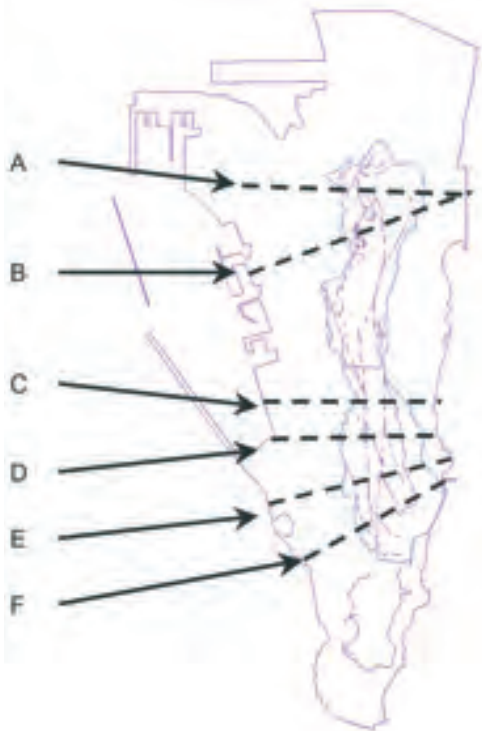
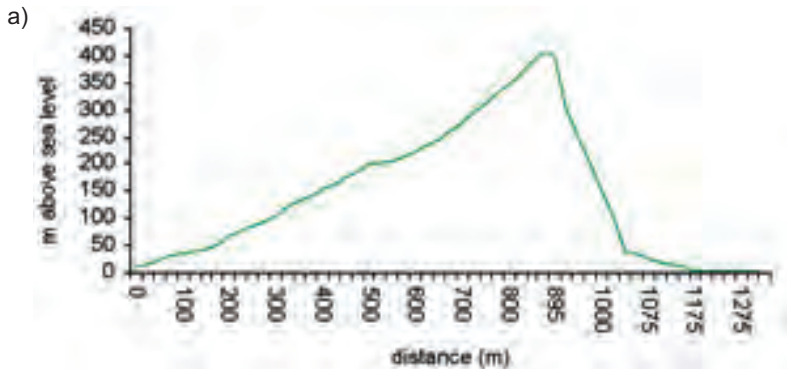
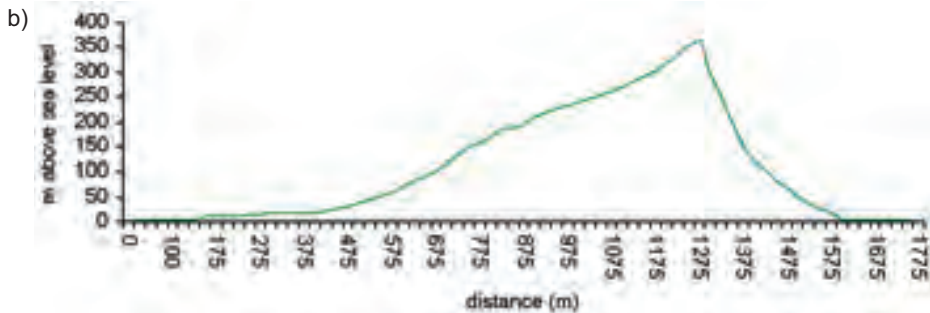


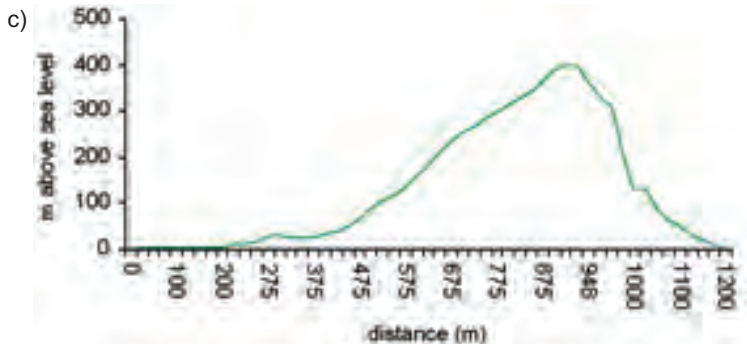
Figure 5. Map of Gibraltar, showing the lines of intersection at which west-east sections of the Rock have been produced. These are labelled A, B, C, D, E & F.



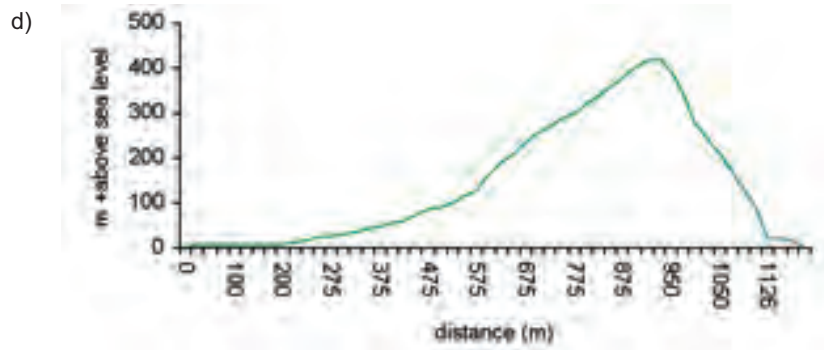
The angle of the slope at this intersection is, on average, about 18°. The angle at Governor's lookout, where most of the pines at this intersection grow, is about 5°.



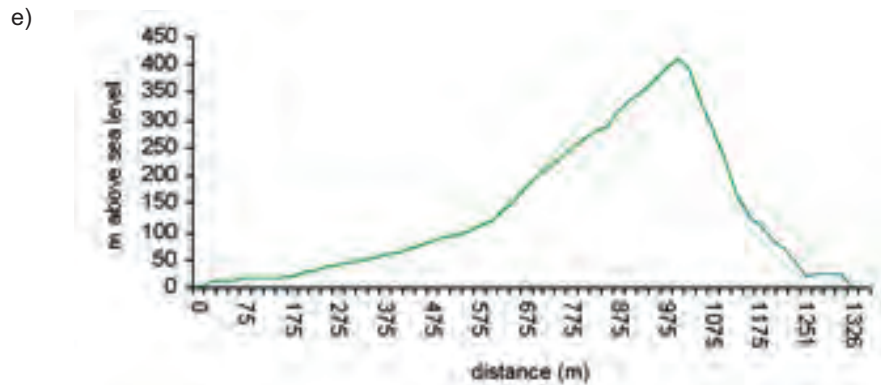
The angle of the slope at this intersection is steeper than the previous, at about 25°.



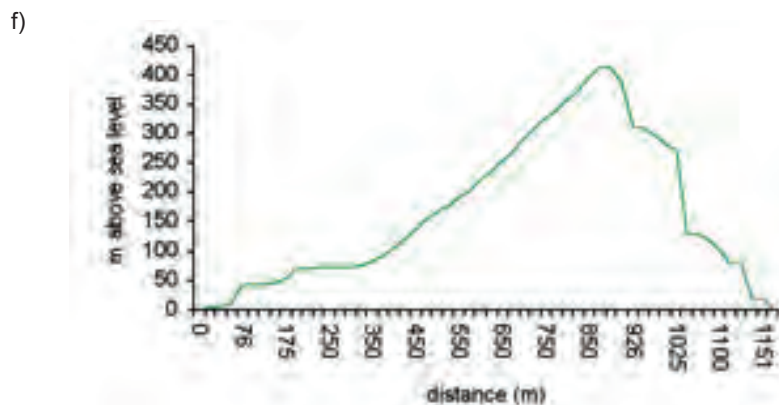
The angle of the slope at this intersection is far greater than the previous two, at about 35°.



The angle of the slope at this intersection is about 36°.



The angle of the slope at this intersection is about 39°.



The angle of the slope at this intersection is about 38°.

Figure 6. West-east sections of the Rock, showing the angle of the western slope of the Rock at different positions from north to south.

Many of our eleven sites cut through more than one of our six intersections of the Rock, and so a correlation between angle of slope and pine tree survivorship cannot be carried out. However, it is plain to see that the angle of the slope at the southern end of the Upper Rock Nature Reserve is markedly steeper than that at the northern end, with slope angles ranging between averages of 18° and 25° at our northern sites, and between 35° and 39° at our southern sites. It is also evident from our results that the two sites at which pine trees have done best, Governor’s Lookout and Signal Station Road, occur towards the northern end of the Upper Rock. There may therefore be a relationship between slope steepness and pine tree survivorship, with pine trees doing better on slopes that are less steep. This may be due to the possibility of two factors; that run-off of water is less drastic on these slopes, and that soil depth is greater. These two factors may aid the continued growth and health of pine trees within the Nature Reserve.

9.4 Discussion

It can be seen from our results that pine tree mortality does not occur at random within the Upper Rock Nature Reserve; rates of mortality differ between our two species, and patterns of mortality differ spatially. Furthermore, it is evident, given that a very large number of trees on the Upper Rock died during or immediately after the drought period of the mid 1990s, that rainfall is a factor that determines pine mortality. Other factors that may affect the health of pines are not

deemed to have contributed significantly to tree mortality during this period. For example, the pine processionary moth *Thaumetopoea pityocampa*, although common in Gibraltar, has never occurred in high enough densities to cause serious damage to pines, as frequently happens in pinewoods in the neighbouring area. Also, it can be argued that the basic nature of the soil on the Upper Rock Nature Reserve favours *P. halepensis* and not *P. pinea*, yet if this were the primary factor, then it would be difficult to explain how many of these trees survived in an apparently healthy state for more than 80 or 90 years.

Another factor to consider is why these trees were affected at this point in time. If they have been around for more than 80 or 90 years, then it seems highly likely that one or more droughts comparable to that of the mid 1990s will have occurred during these trees' lifetime. Why then did the trees perish during this period? A factor that may have affected pine trees on the Upper Rock is the large increase in traffic along all roads over the 1990s. It is not unreasonable to assume that pollution emanating from car exhaust may have affected and weakened trees (particularly since most pines are found along or close to the road), further exposing them to the effect of the drought. What is certain is that pine trees, and more specifically *P. pinea*, are very sensitive to pollution (Quezel 1977; Cortes 1979). Furthermore, the situation may be aggravated during years of low rainfall, when an increased volume of solids originating from car exhaust may accumulate on trees.

Our findings on pine fitness and mortality within the Upper Rock Nature Reserve are discussed next, in relation to their significance to pine tree management on the Upper Rock Nature Reserve.

9.4.1 Are Pine Trees Important to the Upper Rock Nature Reserve?

Before deciding whether or not to recommend the replanting of pine trees in the Nature Reserve, we must examine the role that pine trees have played within the Upper Rock and whether their presence is important.

Pine trees undoubtedly give character to the Nature Reserve; they have over the years lent an aesthetic appeal to the Upper Rock, and in particular its roadsides. Their large canopies, when the majority of pine trees were healthy, provided ample shade for drivers and walkers, and this was particularly important during the summer months when temperatures regularly exceed 30°C. Likewise, pine trees provide shade to picnickers in the Governor's Lookout area. Pines have also provided stability to the sides of roads, and this seems particularly important nowadays given the amount of traffic that passes through the Nature Reserve.

These trees are also beneficial to some of the wildlife of the Nature Reserve. Within the Upper Rock, the pine processionary moth *Thaumetopoea pityocampa*, is obviously only found on pine trees, and the buprestid beetle *Buprestis (Buprestis) magica* is found on *P. halepensis*. Some of the birds that use the Upper Rock also show an association to pine trees. For example, wintering firecrests *Regulus ignicapillus*, are almost always found on pine trees, whilst boot-ed eagles *Hieraaetus pennatus*, (a species which is afforded the SPEC category of 3 and is deemed 'Rare' by BirdLife International (Tucker & Heath 1994)) regularly roost in pine trees during the post-nuptial migration, when prolonged easterlies produce large concentrations of this species on the northern shore of the Strait. Similarly, pine trees are frequently used by passerine migrants such as *Phylloscopus* warblers, and in particular the western Bonelli's warbler *Phylloscopus bonelli*, and also the spotted flycatcher *Muscicapa striata*, and the pied flycatcher *Ficedula hypoleuca*, amongst others.

It seems, therefore, that pine trees have had an important role to play in the Nature Reserve, and that some form of pine tree replanting would be beneficial to the Upper Rock. However, this should be restricted to sites at which these trees were originally planted, and their present range within the Nature Reserve should not be extended. Rather, broad-leaved trees that are known to have occurred on the Upper Rock prior to its deforestation or that occur on nearby limestone mountains should be used in any afforestation programme, as these are known to harbour a higher biodiversity. Such species could include carob *Ceratonia siliqua*, narrow-leaved ash *Fraxinus angustifolia*, round-leaved oak *Quercus rotundifolia*, Algerian oak *Quercus canariensis*, sweet bay *Laurus nobilis*, and possibly nettle tree *Celtis australis* (although the use of this last species must be considered carefully, as it may not in fact be native to this region). For more information on replanting programmes see Chapter 10 and Bensusan & Perez (2003).

9.4.2 Recommendations

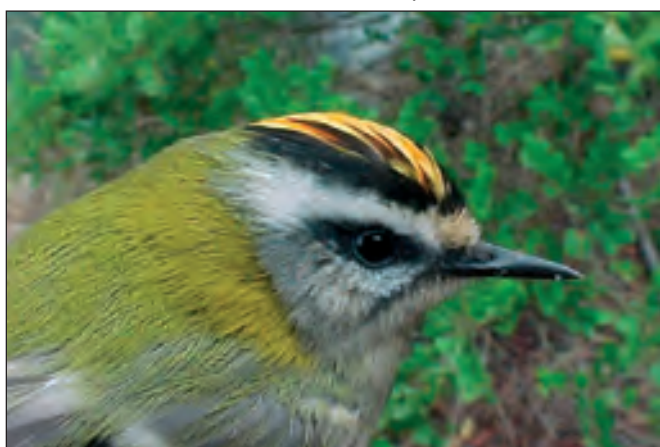
Given the proportion of pine trees found within the Upper Rock Nature Reserve that are dead, it is obvious that an intensive replanting programme is necessary if a pine tree population, which has been characteristic of the Upper Rock over the years, is to continue existing. Some lessons can be learnt from the analysis above, and the following points should be taken into account when replanting pine trees on the Upper Rock:

1) Any dead tree should be replaced with a live tree. This should apply equally to any tree that dies after the implementation of this report.

2) In areas where a good number of pines still remain alive, an additional number of trees should be planted. Pine trees do especially well along Signal Station road and around Governor's Lookout, probably because the slope is less steep at these sites than along most of the Upper Rock. In the event of a tree-replanting programme, a special effort should be made to repopulate these two sites with a good number of trees, as these are most likely to survive here.

3) Many pine trees that are currently found in a live state within the Upper Rock Nature Reserve are not in a good condition. A replanting programme should therefore be quite intensive, as many of the trees that remain alive can perhaps be expected to die in the near future. This should include areas where a good number of pine trees still remain alive.

4) Given that there is no significant difference between the 'fitness' of live trees of both species, the only important factor to consider in a replanting programme is the difference in survivorship between both species. *Pinus halepensis* is better adapted to environments such as that found on the Upper Rock than *P. pinea*. This is shown by the much higher proportion of *P. halepensis* that survived the severe drought of 1994 – 1996, as is evident from our analysis.



Firecrest,
a species associated
with pine trees.

Therefore, in any replanting programme, *P. halepensis* and not *P. pinea* should be used. If any *P. pinea* are to be used, then these should be planted along and around Signal Station Road (on the northern end of the Rock), where survivorship for this species was highest.

5) Pine trees seem to do particularly badly along the road that leads upwards from St. Michael's Cave, Mediterranean Road and Cave Branch Road. It is not surprising that these three sites are located towards the southern end of the Nature Reserve, as the slope is steeper in this area and therefore one would expect a lower depth of soil and greater runoff of water here. In fact, it can be seen clearly from the maps in Fig. 4 that the southern end of the Upper Rock has lost many more pine trees than the northern end. These areas should therefore be avoided in a pine tree-replanting programme. Rather, the planting of drought-resistant, broad-leaved species that provide shade should be looked into for these sites.

6) It is interesting to note that pine trees are very susceptible to pollution (Quezel 1977). This may be one of the reasons why these trees perished; the combination of a severe drought and increased traffic may have provided the deathblow. Restricted use of the roads along the upper reaches of the Nature Reserve would therefore benefit any pine-replanting programme.

7) A total of 194 dead pine trees can be found on the Upper Rock. It is the authors' opinion that these should be felled and left where they are, as they provide a habitat for a large diversity of invertebrates, as well as hibernating reptiles. If any dead tree poses a danger (e.g., if it overhangs a road precariously), then this should be felled and left lying in the same spot where it grew. This will not only provide a habitat for wildlife but also enrich the soil in the decaying process. Dead pine trees within the Nature Reserve are quickly attacked by wood-boring invertebrates, such as the termite *Reticulitermes lucifugus*, and beetles of the families Buprestidae and Cerambycidae. This accelerates the decomposition of dead trees. Although dead pine trees could be seen by some as a fire hazard, they are not any more of a hazard than any dead or live tree within the Nature Reserve. In fact, live pine trees burn for a longer period of time due to their resinous nature. Dead pine tree removal should not, therefore, be justified through these means.

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10. Habitats

10. Habitats

10.1 Introduction

The Upper Rock boasts a rich flora, with 363 species having been recorded within the boundary of the Nature Reserve (Linares 2003). The vegetation of the Upper Rock Nature Reserve is dominated by closed Mediterranean shrubland known as maquis (a tall, thick type of Mediterranean matorral), which consists of a dense community of evergreen, sclerophyllous shrubs that typically replaces evergreen woodland after fire or deforestation (Rocamora 1997), as was the case with the Upper Rock following the initial removal of its Mediterranean woodland. Maquis habitats are not determined by any species of trees or bushes in particular (Tomaselli 1977), but the typical shrub genera that dominate in this habitat, depending on location, soil and other conditions, are *Arbutus*, *Cistus*, *Erica*, *Olea*, *Phyllirea*, *Genista*, *Calycotome*, *Sarothamnus*, *Quercus*, *Ulex*, *Rhamnus*, *Pistacia* and *Myrtus* (Rocamora 1997).

All indications are that the vegetation of the Upper Rock once consisted of Mediterranean woodland. It is certain that *Ceratonia siliqua* and *Olea europea* were once dominant trees on the Upper Rock (Portillo ca. 1620). If the woodland that is found on nearby limestone mountains is taken as an indication of what tree species may have occurred on Gibraltar, then it is likely that *Quercus rotundifolia*, *Fraxinus angustifolia* and *Pinus halepensis* (which is now found on the Upper Rock again, having been introduced during the early 1900s (Wolley-Dod 1914; Bensusan & Perez 2004)) were possibly found on the Rock as well (Bensusan & Perez 2003, 2004). In addition, *Quercus canariensis* and/or *Quercus faginea* may have grown in areas that retain more moisture.

In fact, we know that *Quercus rotundifolia* probably occurred on the Rock until at least 150 years ago. Kelaart (1846) mentions *Quercus ilex* as growing in inaccessible areas of the western slope of the Rock (*Q. rotundifolia* was formally considered a subspecies of *Q. ilex*, i.e., *Q. ilex rotundifolia*, and so Kelaart (1846) presumably refers to this species). These were probably the last vestiges of the woodland once found on the Upper Rock. In addition, the wooded area above the Mount, which still retains a woodland character, harbours a number of apparently indigenous *Fraxinus angustifolia*.

Most of the woodland of the Upper Rock was eventually cleared by the British Garrison during the great siege, when firewood was in demand. Vegetation was subsequently kept very low by the goats that grazed on the Upper Rock (Cortes 1994). It is for this reason that photographs of the Rock taken in the late 1800s reveal a very stony landscape with little vegetation. It was in fact the removal of goats from the Upper Rock that caused the vegetation to develop into the maquis that can be seen today (Cortes 1979).

The maquis species composition that is found in Gibraltar today is unique in the region (Cortes, in Heath & Evans 2000; Galán de Mera *et al.* 2000) due largely to the Rock's basic soils, and includes such species as *Olea europea*, *Osyris quadripartita*, *Pistacia lentiscus*, *Pistacia terebinthus*, *Rhamnus alaternus*, *Jasminum fruticans*, *Lonicera implexa*, *Rubia perigrina*, *Ruscus hypophyllum*, *Calicotome villosa*, *Coronilla valentina* and *Genista linifolia* (Linares 1994). This already dense maquis is made impenetrable in places by the climbing plants *Smilax aspera*, *Aristolochia baetica*, *Tamus communis* and *Clematis cirrhosa* (Linares *et al.* 1996). In addition, scattered individuals of *Laurus nobilis*, *Rhamnus lycioides*, *Clematis flammula*, *Quercus coccifera*, *Celtis australis*, *Anagyris foetida*, *Ceratonia siliqua*, *Crataegus monogyna* and *Phillyrea latifolia* also occur (Linares 1994).

The Upper Rock also holds several smaller areas that hold habitats other than maquis. Some areas are dominated by garigue; a discontinuous, low matorral which on the Upper Rock occurs where soil is thin or covered by scree, or where mismanaged pseudosteppe (which will be described next) is slowly reverting back to maquis (Cortes 1979). Its heterogeneity means that areas that are dominated by garigue-type vegetation are often rich in flora. This is evident, for example, in the southernmost slopes of the Upper Rock; those that lead downward from Governor's Cottage to beyond the initial stretch of the path leading to the Mediterranean Steps. Garigue is in fact fairly rare and localised on the Upper Rock, and decreasing, as we shall see later.

In addition to those vegetation types that can be classified under the broad term 'matorral', open areas such as firebreaks and disused water catchments exist on the Upper Rock, and these support a very wide diversity of flora (about 37% of plant species found on the Upper Rock can be found growing on firebreaks (Linares 1997)). These areas can be classified as pseudosteppe, a mainly herbaceous vegetation with low plant cover that has been caused by man through regular clearing (Cortes 1979). Since roadsides are cleared, these

can be considered as pseudosteppe (albeit extremely small areas of this habitat), and in fact the flora of roadsides on the Upper Rock shares many similarities with those of the fire-breaks.

Although we have a very good knowledge of the species that are found on the Upper Rock (and where on the Upper Rock these are found), the vegetation of the Upper Rock has not been seriously analysed since 1979. Cortes (1979) recorded five different vegetation types on the Upper Rock: High Maquis, Low Maquis, Maquio-garigue, Garigue, and Pseudosteppe and Steppe. However, given that this vegetation is gradually becoming thicker and taller, some features may have changed since then. We therefore set about analysing the vegetation types found on the Upper Rock with a view to comparing our results to those of Cortes (1979) and then taking considerations on the future of the Upper Rock's vegetation, including possible recommendations on the future management of habitats.

10.2 Methods

A comprehensive survey of the Upper Rock's vegetation is a very laborious and time-consuming task. Cortes (1979) carried his study out selecting a number of random quadrats within the Upper Rock. He then analysed their vegetation using the 'Domin Scale', with 'Domin' values ascribed to each of the most characteristic species of the sample area. The Domin scale is shown in table 1.

Table 1. Domin scale, with the definition of each value.

Amount of cover/species	Domin value
cover about 100%	10
cover >75%	9
cover 50-75%	8
cover 33-50%	7
cover 25-33%	6
abundant, cover about 20%	5
abundant, cover about 5%	4
scattered, cover small	3
very scattered, cover small	2
scarce, cover small	1
isolated, cover small	X

Choosing and marking out quadrats is a task in itself. Since our time was limited, we chose to use boundaries defined by the roads of the Upper Rock, as well as by the vegetation itself. Otherwise, our methods were similar to those employed by Cortes in his 1979 study.

The Upper Rock was divided into 57 different sample areas, and the vegetation within each of these was assessed using the Domin Scale. Once this was done, areas were classified according to their vegetation. Cortes identified five different vegetation-types on the Upper Rock using the Domin method. These are given in table 2.

Table 2. Cortes' (1979) classification of vegetation types on the Upper Rock. Domin values are given as approximations, and both these and species compositions may obviously differ slightly from one area to another.

Vegetation Type	Species	(Approximate) Domin Value
High Maquis	<i>Olea europea</i>	8
	<i>Pistacia lentiscus</i>	5
	<i>Rhamnus alaternus</i>	5
	<i>Osyris quadripartita</i>	4
	<i>Chamaerops humilis</i>	3
	<i>Calicotome villosa</i>	2
	<i>Genista linifolia</i>	2
	<i>Acanthus mollis</i>	5
	<i>Pinus pinea</i>	(in some areas) 8-9
Low Maquis	<i>Genista linifolia</i>	9
	<i>Calicotome villosa</i>	5
	<i>Olea europea</i>	5
	<i>Pistacia lentiscus</i>	4
	<i>Osyris quadripartita</i>	3
	<i>Coronilla valentina</i>	3
Maquio-garigue	<i>Olea europea</i>	6
	<i>Oxalis pes-capre</i>	6
	<i>Hyparrhenia hirta</i>	6
	<i>Rhamnus alaternus</i>	5
	<i>Osyris quadripartita</i>	3
	<i>Calicotome villosa</i>	3
	<i>Genista linifolia</i>	3
	<i>Pistacia lentiscus</i>	3
	<i>Coronilla valentina</i>	2
Garigue	<i>bare ground</i>	5
	<i>Oxalis pes-capre</i>	5
	<i>Narcissus papyraceus</i>	5
	<i>Acanthus mollis</i>	4
	<i>Pistacia lentiscus</i>	3
	<i>Asphodelus aestivus</i>	3
	<i>Chamaerops humilis</i>	3
Pseudosteppe & Steppe	<i>bare ground</i>	5
	<i>Dactylis glomerata</i>	5
	<i>Ferula tingitana</i>	3
	<i>Smyrnium olusatrum</i>	3
	<i>Asteriscus maritimus</i>	3
	<i>Asphodelus aestivus</i>	3
	<i>Narcissus papyraceus</i>	3
	<i>Gladiolus communis</i>	2

The vegetation classifications used in this study are based broadly on those recorded by Cortes (1979) and shown in table 2. However, it must be stressed when looking at different habitats on the Upper Rock that vegetation types are very hard to define (Cortes 1979), and that since these tend to develop from one form to another (with pseudosteppe at the bottom of the scale and high maquis on the top, as shall be seen later), it is inevitable that some forms or structures of vegetation will fall in-between the broad categorisations that describe our different vegetation types. This is evident from our study, as some of the vegetation types recorded within the Nature Reserve do indeed constitute intermediate forms of vegetation.

In addition to those recorded by Cortes (1979), four new types of vegetation were recorded, with nine different vegetation-types identified in total. These were High Maquis, Low

Maquis, Maquio-garigue, Garigue, Pseudosteppe, Low Maquis/High Maquis, Pseudosteppe/Garigue, Open, Semi-exotic woodland and Mediterranean Woodland with some Exotics.

Once all sample areas were classified according to their vegetation, Average Domin values were calculated for each species within each habitat. In addition, the number of sample areas in which each species was recorded was also calculated. Average Domin values were calculated only from the number of samples in which the species was recorded. Thus, giving a value for the number of samples in which a species was found gives an idea of distribution (although it is recognised that some samples differ greatly in size), whilst the average Domin value shows the species' dominance within the samples in which it was found. It must be stressed that species may well have been found in more samples than recorded, only not in a high enough density to score a Domin value.

10.3 Results

Our results on each habitat type are given below. The average Domin value (given to 1 d.p.), taken from those samples in which the species was recorded only, is given alongside each species. The number of sample areas in which each species was recorded is given in brackets, and species are listed in order of the number of samples that they were recorded in.

10.3.1 High Maquis; 2.00-5.00m (27 samples)

<i>Olea europea</i>	8.5 (27)	<i>Pinus halepensis</i>	1.8 (4)
<i>Osyris quadripartita</i>	4.6 (27)	<i>Coronilla valentina</i>	2.7 (3)
<i>Rhamnus alaternus</i>	3.2 (26)	<i>Ficus carica</i>	1 (3)
<i>Pistacia lentiscus</i>	2.8 (24)	<i>Crataegus monogyna</i>	1 (3)
<i>Clematis cirrhosa</i>	4 (17)	<i>Senecio angulatus</i>	4 (2)
<i>Smilax aspera</i>	3.4 (15)	<i>Asparagus albus</i>	3 (2)
<i>Pistacia terebinthus</i>	1.9 (15)	<i>Opuntia ficus-indica</i>	2.5 (2)
<i>Aristolochia baetica</i>	3.5 (14)	<i>Ferula tingitana</i>	2.5 (2)
<i>Acanthus mollis</i>	3.1 (13)	<i>Ephedra fragilis</i>	1.5 (2)
<i>Lonicera implexa</i>	2.8 (12)	<i>Laurus nobilis</i>	1.5 (2)
<i>Genista linifolia</i>	2.1 (12)	<i>Ceratonia siliqua</i>	1 (2)
<i>Tamus communis</i>	2.8 (10)	<i>Prunus spp.</i>	1 (2)
<i>Calicotome villosa</i>	2 (10)	<i>Prasium majus</i>	3 (1)
<i>Teucrium fruticans</i>	2.8 (8)	<i>Hyparrhenia hirta</i>	3 (1)
<i>Carthamus arborescens</i>	2 (8)	<i>Asphodelus aestivus</i>	2 (1)
<i>Celtis australis</i>	1.8 (6)	<i>Stipa tenacissima</i>	2 (1)
<i>Bupleurum fruticosum</i>	2.6 (5)	<i>Eucalyptus camaldulensis</i>	2 (1)
<i>Chamaerops humilis</i>	1.6 (5)	<i>Thapsia villosa</i>	2 (1)
<i>Phylliera latifolia</i>	3 (4)	<i>Psoralea bituminosa</i>	2 (1)
<i>Pinus pinea</i>	2.5 (4)	<i>Anagyris foetida</i>	1 (1)
bare rock/open areas	2.5 (4)	<i>Clematis flammula</i>	1 (1)

10.3.2 Low Maquis; 1.00-1.80m (5 samples)

<i>Olea europea</i>	5.4 (5)	<i>Cistus albidus</i>	3 (1)
<i>Osyris quadripartita</i>	4 (5)	<i>Clematis cirrhosa</i>	2.5 (2)
<i>Rhamnus alaternus</i>	2.8 (5)	<i>Hyparrhenia hirta</i>	2.5 (2)
<i>Pistacia lentiscus</i>	4 (4)	<i>Coronilla valentina</i>	2 (2)
<i>Chamaerops humilis</i>	3.8 (4)	<i>Lonicera implexa</i>	1.5 (2)
<i>Calicotome villosa</i>	2.3 (4)	open rock	2 (1)
<i>Pistacia terebinthus</i>	2 (4)	<i>Malva sylvestris</i>	2 (1)
<i>Stipa tenacissima</i>	2.5 (4)	<i>Diploaxis siifolia</i>	2 (1)
<i>Acanthus mollis</i>	3.3 (3)	<i>Psoralea bituminosa</i>	2 (1)
<i>Genista linifolia</i>	2.7 (3)	<i>Teucrium fruticans</i>	2 (1)
<i>Rhamnus lycioides</i>	2 (2)	<i>Carthamus arborescens</i>	2 (1)
<i>Asparagus albus</i>	4 (1)	<i>Bupleurum fruticosum</i>	2 (1)
<i>Jasminum fruticans</i>	4 (1)	<i>Opuntia ficus-indica</i>	2 (1)
grasses	4 (1)	<i>Rosmarinus officinalis</i>	2 (1)
<i>Quercus coccifera</i>	1 (1)	<i>Clematis flammula</i>	1 (1)

10.3.3 Maquio-garigue; 0.50-4.00m (7 samples)

<i>Olea europea</i>	5.7 (7)	<i>Avena spp.</i>	2 (2)
<i>Osyris quadripartita</i>	3.1 (7)	<i>Thapsia villosa</i>	1.5 (2)
<i>Asphodelus aestivus</i>	2.8 (5)	<i>Celtis australis</i>	1 (2)
<i>Stipa tenacissima</i>	5.3 (4)	<i>Galactites tomentosa</i>	3 (1)
<i>Carthamus arborescens</i>	3 (4)	<i>Compositae spp.</i>	3 (1)
open rock	5.3 (3)	<i>Lavandula dentata</i>	3 (1)
<i>Pistacia lentiscus</i>	4.3 (3)	<i>Genista linifolia</i>	3 (1)
<i>Asteriscus maritimus</i>	3 (3)	<i>Acanthus mollis</i>	3 (1)
<i>Calicotome villosa</i>	2.7 (3)	<i>Ephedra fragilis</i>	3 (1)
<i>Hyparrhenia hirta</i>	3.5 (2)	<i>Smyrnium olusatrum</i>	3 (1)
<i>Asparagus albus</i>	3 (2)	grasses	3 (1)
<i>Chamaerops humilis</i>	3 (2)	<i>Euphorbia squamigera</i>	2 (1)
<i>Teucrium fruticans</i>	3 (2)	<i>Rhamnus lycioides</i>	1 (1)
<i>Rhamnus alaternus</i>	2.5 (2)	<i>Aristolochia baetica</i>	1 (1)
<i>Pistacia terebinthus</i>	2.5 (2)	<i>Rosmarinus officinalis</i>	1 (1)
<i>Ferula tingitana</i>	2.5 (2)	<i>Lonicera implexa</i>	1 (1)
<i>Teucrium lusitanicum</i>	2 (2)	<i>Prasium majus</i>	1 (1)
<i>Opuntia ficus-indica</i>	2 (2)		

10.3.4 Garigue; 0.25-0.50m (3 samples)

bare rock/scree	8 (2)	<i>Asphodelus aestivus</i>	3 (1)
<i>Osyris quadripartita</i>	1 (2)	<i>Olea europea</i>	3 (1)
<i>Acanthus mollis</i>	8 (1)	<i>Chamaerops humilis</i>	3 (1)
Grasses/herbs	7 (1)	<i>Genista linifolia</i>	2 (1)
<i>Hyparrhenia hirta</i>	6 (1)	<i>Coronilla valentina</i>	2 (1)
<i>Stipa tenacissima</i>	6 (1)	<i>Prasium majus</i>	2 (1)
<i>Pistacia lentiscus</i>	5 (1)	<i>Carpobrotus acinaciformis</i>	1 (1)
<i>Aloe arborescens</i>	4 (1)	<i>Opuntia ficus-indica</i>	1 (1)

10.3.5 Pseudosteppe; 0.20-0.75m (5 samples)

<i>Acanthus mollis</i>	4.4 (5)	<i>Antirrhinum majus</i>	3 (1)
<i>Carthamus arborescens</i>	3.4 (5)	<i>Reseda alba</i>	3 (1)
<i>Ferula tingitana</i>	2.6 (5)	<i>Euphorbia squamigera</i>	3 (1)
<i>Smyrnium olusatrum</i>	6 (3)	<i>Diploaxis siifolia</i>	3 (1)
bare rock-ground	5.7 (3)	<i>Shinus molle</i>	3 (1)
<i>Galactites tomentosa</i>	5 (3)	<i>Chamaerops humilis</i>	3 (1)
<i>Teucrium fruticans</i>	5 (3)	<i>Pistacia lentiscus</i>	3 (1)
<i>Asphodelus aestivus</i>	2.7 (3)	<i>Echium creticum</i>	2 (1)
<i>Thapsia villosa</i>	3 (2)	<i>Iberis gibraltaria</i>	2 (1)
<i>Convolvulus althaeoides</i>	3 (2)	<i>Verbascum sinuatum</i>	2 (1)
<i>Asteriscus maritimus</i>	2.5 (2)	<i>Foeniculum vulgare</i>	2 (1)
grasses	8 (1)	<i>Celtis australis</i>	1 (1)
<i>Chasmanthe floribunda</i>	7 (1)	<i>Chrysanthemum coronarium</i>	1 (1)
<i>Hyparrhenia hirta</i>	4 (1)	<i>Olea europea</i>	1 (1)
<i>Malva sylvestris</i>	4 (1)	<i>Rhamnus alaternus</i>	1 (1)
<i>Oxalis pes-capre</i>	4 (1)	<i>Nicotiana glauca</i>	1 (1)
<i>Genista linifolia</i>	3 (1)	<i>Eucalyptus camaldulensis</i>	1 (1)
<i>Ecbalium elaterium</i>	3 (1)		

In addition to the above vegetation types, some others were also identified. Two of these were intermediates between two vegetation types; low maquis/high maquis and pseudosteppe/garigue. These are given next, together with their species composition.

10.3.6 Low Maquis/High Maquis; 2.00m (1 sample)

<i>Olea europea</i>	8	<i>Genista linifolia</i>	2
<i>Osyris quadripartita</i>	5	<i>Acanthus mollis</i>	2
<i>Teucrium fruticans</i>	3	<i>Stipa tenacissima</i>	2
<i>Carthamus arborescens</i>	3	<i>Ferula tingitana</i>	2
<i>Pistacia lentiscus</i>	2	<i>Laurus nobilis</i>	1
<i>Aristolochia baetica</i>	2	<i>Smilax aspera</i>	1
<i>Clematis cirrhosa</i>	2	<i>Tamus communis</i>	1
<i>Chamaerops humilis</i>	2	<i>Pistacia terebinthus</i>	1
<i>Rhamnus alaternus</i>	2		

10.3.7 Pseudosteppe/Garigue; 0.40-1.00m (3 samples)

open/bare rock	7 (3)	<i>Avena spp.</i>	2.5 (2)
<i>Psoralea bituminosa</i>	4 (3)	<i>Osyris quadripartita</i>	1.5 (2)
<i>Dittrichia viscosa</i>	4(3)	<i>Pistacia lentiscus</i>	1 (2)
<i>Genista linifolia</i>	2.7 (3)	<i>Rhamnus alaternus</i>	3 (1)
<i>Calicotome villosa</i>	2.3 (3)	<i>Acanthus mollis</i>	2 (1)
<i>Phagnalon saxatile</i>	2.3 (3)	<i>Clematis flammula</i>	2 (1)
<i>Asteriscus maritimus</i>	2 (3)	<i>Coronilla valentina</i>	1 (1)
<i>Foeniculum vulgare</i>	5.5 (2)	<i>Olea europea</i>	1 (1)
<i>Hyparrhenia hirta</i>	3 (2)	<i>Lonicera implexa</i>	1 (1)

Finally, two woodland habitats were identified within our samples. These were 'open, semi-exotic woodland' (PSA Nursery) and 'Mediterranean woodland with some exotics' (Upper Mount Garden). Their species compositions are given next.

10.3.8 Open, Semi-exotic Woodland; 10.00m (1 sample)

<i>Olea europea</i>	5	<i>Plumbago auriculata</i>	3
<i>Senecio angulatus</i>	5	<i>Rosmarinus officinalis</i>	3
<i>Acanthus mollis</i>	5	<i>Eucalyptus camaldulensis</i>	3
<i>Ailanthus altissima</i>	4	<i>Eucalyptus globulus</i>	3
<i>Opuntia ficus-indica</i>	4	<i>Celtis australis</i>	2
<i>Rhamnus alaternus</i>	3	<i>Pittosporum japonica</i>	2
<i>Ficus carica</i>	3	<i>Jasminum fruticans</i>	2
<i>Tecoma capensis</i>	3	<i>Pinus halepensis</i>	1
<i>Osyris quadripartita</i>	3	<i>Cupressus sempervirens</i>	1
<i>Genista linifolia</i>	3	<i>Prunus communis</i>	1

10.3.9 Mediterranean Woodland with some Exotics; 10.00m (1 sample)

<i>Olea europea</i>	7	<i>Cupressus sempervirens</i>	4
<i>Celtis australis</i>	5	<i>Aristolochia baetica</i>	4
<i>Ulmus minor</i>	5	<i>Lantana camara</i>	4
<i>Laurus nobilis</i>	5	<i>Rubus ulmifolius</i>	3
<i>Acanthus mollis</i>	5	<i>Ficus carica</i>	2
<i>Ailanthus altissima</i>	4	<i>Ceratonia siliqua</i>	1

Using the data collected, the habitats of the Upper Rock can be mapped, as shown in Fig. 1. In addition, Figs. 2-8 show examples of vegetation-types on the Upper Rock.

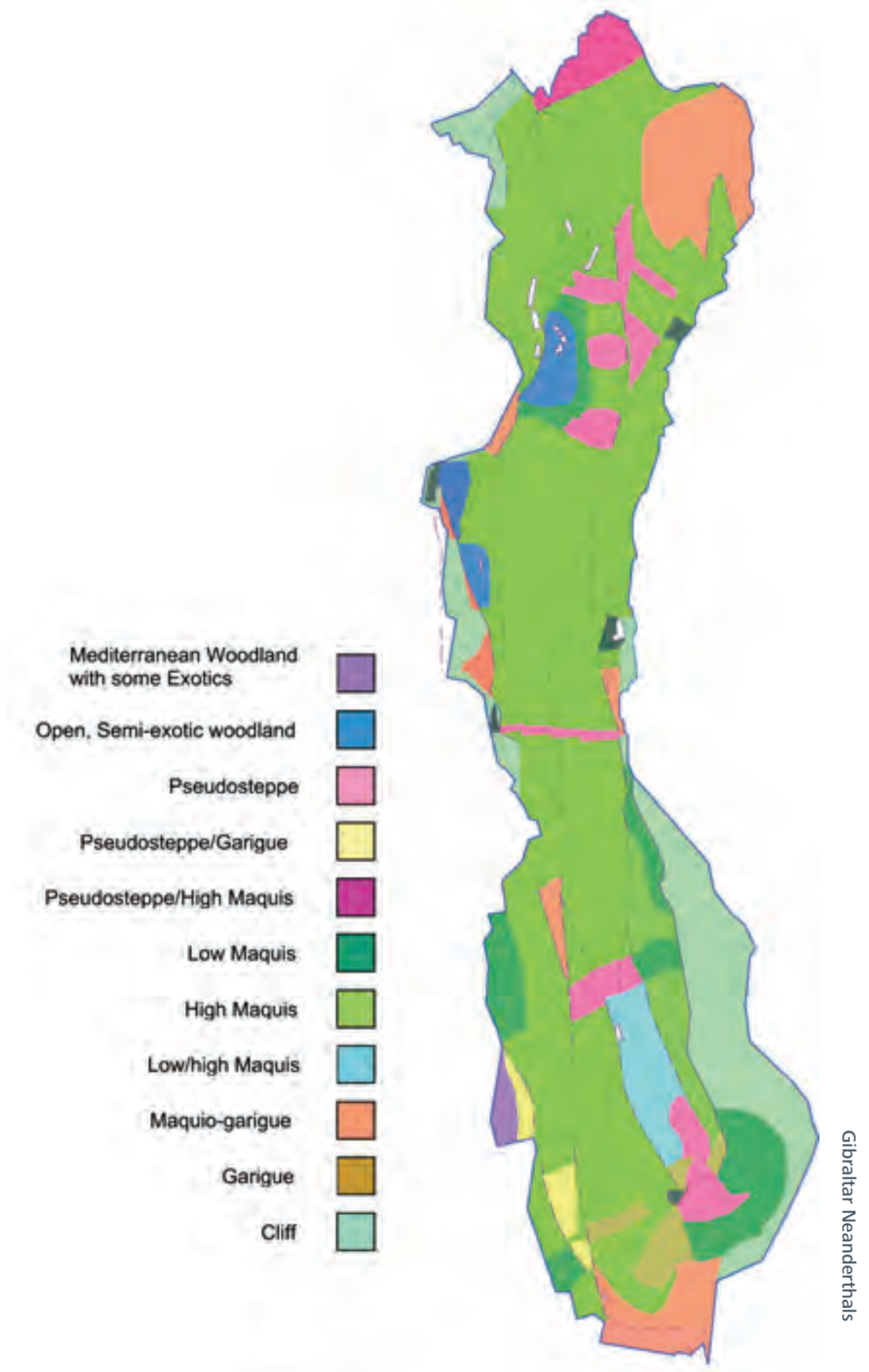


Figure 1. Map of the Upper Rock Nature Reserve showing the extent of each habitat recorded.



Figure 2. High Maquis.



Figure 5. Garigue



Figure 3. Low Maquis, contrasting with High Maquis in the background.



Figure 6. Pseudosteppe.



Figure 4. Maquio-garigue.



Figure 7. Open, semi-exotic woodland at Bruce's Farm.



Figure 8. Mediterranean woodland with *Celtis australis* in the Mount.

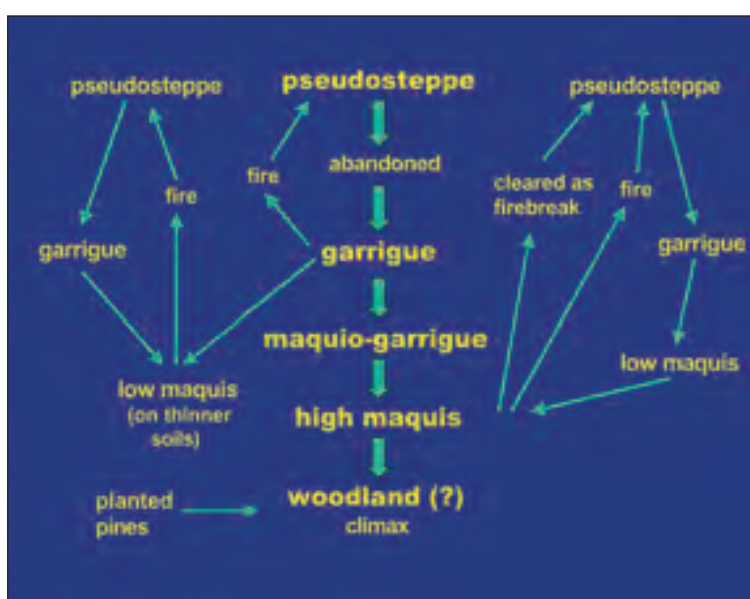
10.4 Discussion

10.4.1 Development and Succession of Vegetation on the Upper Rock

It is evident that the maquis on the Upper Rock has developed considerably since Cortes (1979) carried out his study. A look at Cortes' (1979) results and our own shows that the vegetation of the Upper Rock has progressed to the extent that the composition of the maquis is now different to what it was 24 years ago. Although discrepancies between values recorded for herbaceous plants can be explained through seasonality (i.e., the effect of carrying out two similar studies at different times of the year), it is the dominating, woody shrubs, which are present all year round that provide the most noticeable differences. The taller *Olea europaea* has remained the dominant shrub of the Upper Rock's maquis, but its continued growth has resulted in the gradual exclusion of smaller shrubs such as *Calicotome villosa* and *Genista linifolia*, which, although still not rare, are certainly far less common now than when Cortes (1979) carried out his study. Although an in depth study using an identical methodology to that employed by Cortes (1979) would be welcomed in order to accurately ascertain the development of the maquis on the Upper Rock, the very large differences between our results and his mean that a fairly accurate indication is given on the new status of most species.

Although this next point is not shown in our data, it is evident on visual examination of the Upper Rock's maquis that most of the *Calicotome villosa*, *Genista linifolia* and *Coronilla valentina* that now grows on the Upper Rock does so in two main areas. The first are the neglected firebreaks where the matorral has still not developed to a height that excludes these species. In addition, these species are also common on roadsides and firebreak

edges. In this last case, it is the continued clearing of these habitats that allows these species to maintain a presence in these areas.



Cortes (1979) attempted to schematise the development of vegetation on the Upper Rock. The diagram produced can be seen in Fig. 9.

Figure 9. Vegetation succession as it occurs on the Upper Rock (taken from Cortes (1979)).

It is interesting to note that, whereas the scheme continues to be correct in its progression, there seems to be some disagreement between Cortes (1979) and us over what constitutes each habitat. For example, Domin figures given by Cortes for some of the species in his high maquis correspond to those recorded in our low maquis. This can be easily explained though. Cortes (1979) obviously classified his maquis according, in part, to the highest and lowest maquis found on the Rock, as have we. Thus, for example, shrubs belonging to the Papilionaceae (= Fabaceae or Leguminosae) and Labiatae are far less prevalent in our low maquis than in that of Cortes (1979). In fact, these discrepancies between our results and his illustrate the very dynamic nature of vegetation progression, and how quickly vegetation-types can disappear, being replaced by new ones. If the vegetation on the Upper Rock continues to develop at the rate that it has done since 1979, then it can only be supposed that the already ubiquitous *Olea europea*, being the tallest shrub, will eventually become even more dominant. This may result in the eventual exclusion of species that are still very common components of the Upper Rock's matorral, such as *Osyris quadripartita* and *Pistacia lentiscus*. *Rhamnus alaternus*, which also grows well in shady woodland understories, would possibly remain a common shrub in most areas. At the same time the continued presence on the Upper Rock of some of the species of the more open habitats, such as *Lavandula multifida*, *Lavandula dentata* and *Daphne gnidium* may under threat.

10.4.2 *Acanthus mollis*

It seems that the problematic species *Acanthus mollis* subsp. *platyphyllos* was under-recorded by us within the maquis, but our methodology explains this. Habitats were assessed visually from the sides of roads, and so understorey plants were under-recorded. Cortes (1979) obviously penetrated the vegetation in his efforts to record its composition. We did not have the time to do this. Thus, Cortes gives *A. mollis* a Domin score of 5, whereas this species scored 3.1 on average in our study. It is unlikely that this species has decreased within the maquis, given that *A. mollis* is more common on the Upper Rock now than it was 25 years ago (Linares *et al.* 1996; Linares 1997). In this sense, an analysis of the understorey of maquis habitats on the Rock would be desirable for a full comparison with Cortes' (1979) findings.

A larger discrepancy is noticeable between our Domin values for *A. mollis* and those recorded by Cortes (1979) in areas of pseudosteppe. Neither methodology would have missed its presence and thus this must be a true reflection of the relative position in the two studies. In table 2, we can see that *A. mollis* did not form an important component of the pseudosteppe of the Upper Rock in 1979, to the extent that no value is given for this species at all. This contrasts sharply with our findings. In 2003, *A. mollis* was found to be the most common and most dominant species of the pseudosteppe; it was found growing in all five samples of this habitat, and scored a higher Domin value than any other species. These findings illustrate that the spread of *A. mollis* into open habitats on the Upper Rock has been a recent phenomenon. This is interesting, given that *A. mollis* has always been associated with shaded areas. The reasons behind this recent spread are unclear. However, it is possibly related to the less intense clearing regime to which the pseudosteppe (largely within the fire-breaks) is currently subjected.

A. mollis poses a serious threat to the flora of these open, pseudosteppe habitats. The leaves of this species are large, and thus allow little sunlight to reach the ground. This means that few if any other plants can grow where this species has spread. If left unchecked, this will no doubt cause a reduction in the biodiversity of the Upper Rock Nature Reserve (Linares 1997). *A. mollis* currently threatens all open habitats on the Upper Rock. This includes roadsides, which are also extremely important to the maintenance of floral diversity on the Upper Rock.

Every effort should be made to control the spread of *A. mollis* on the Upper Rock. This could be done as part of the firebreaks and roadsides clearing operation (see section 10.43, and Chapters 5 & 11). Personnel entrusted with the clearing of these areas could be instructed to target this species in particular. However, any programme to control the spread of this species and remove it from open areas should ideally be timed a few months earlier than the actual clearing operation (during the early spring) when these plants are in leaf but have not yet produced seed. Plants could be cleared either manually or with the use of herbicide. If herbicide is used, then the utmost care should be taken to ensure that *Acanthus* leaves alone are sprayed, and that this affects no other species. A herbicide containing glyphosphate would be suitable for this.

It is interesting to note that populations of *Acanthus mollis* in nearby Spain do not show the same tendencies as those on the Rock. This species is not found growing in open areas in southern Spain, and even in shaded areas *A. mollis* does not seem to be as abundant as in Gibraltar. This may suggest that natural enemies (such as large herbivores, see 10.47)

that this species may have in the hinterland are absent from Gibraltar. Certainly, sweep-netting of *A. mollis* in Gibraltar has revealed that this plant does not seem to support an entomofauna on the Rock. A study into the reasons for these differences would be greatly welcomed, as the results and findings of such research would provide some important aid in the control of this species (see Chapter 17, section 9).

10.4.3 Firebreaks and Roadsides

The management of firebreaks on the Upper Rock, including considerations on their vegetation, is dealt with in Chapter 11. The regular clearing of roadsides is also thoroughly important to the maintenance of floral diversity within the Nature Reserve, given the features that these areas share with firebreaks and their importance to herbaceous plants. This is dealt with in Chapter 5, section 9.

10.4.4 Rock Gun

The disused water catchment within the MOD site at Rock Gun and Middle Hill forms the largest open area in the whole of the Upper Rock Nature Reserve. As such, it is of considerable importance to the flora of the Upper Rock Nature Reserve, and the many species that grow at this site include some endemic and near-endemic taxa. Indeed, *Silene tomentosa*, one of the rarest plants in the world, was last recorded growing wild at this site. Rock Gun's importance to local wildlife and its proposed management are discussed in Chapters 18 & 17, and also in Bensusan & Perez (2003).

10.4.5 The Mount and PSA Gardens

The Mount and PSA Gardens form the only stands of woodland within the Upper Rock Nature Reserve. The Mount in particular boasts an array of Mediterranean woodland tree species that, within Gibraltar, either find their stronghold here or are found nowhere else. This is the case, for example, with *Celtis australis*, *Ulmus minor* and *Laurus nobilis*. In addition, the understorey at the Mount, which is composed mainly of *Vinca difformis*, *Acanthus mollis*, *Rubus ulmifolius* and *Hedera helix* has a unique character that gives the site a true woodland feel. This is accentuated by the presence of woodland plant species such as *Arum italicum*, which also grows well in shady areas within some of the taller vegetation of the Upper Rock, such as the Ince's Farm area.

Since both of our woodland sites were once gardens, exotic flora is unfortunately a prevalent feature of these habitats. This is particularly the case with the PSA nursery, which, as can be seen from the results, is composed mainly of exotic species. Some exotic species, such as *Eucalyptus* spp. or *Cupressus sempervirens* pose little or no threat to native flora, given that they rarely or never produce fertile seeds and do not form suckers, and cannot therefore spread. However, other exotics such as *Senecio angulatus* pose a very serious threat given the rate at which they spread and their effect on other flora (this is described in Chapter 8). These exotics should be removed from these habitats. Methods with which to deal with such species as *Senecio angulatus*, *Opuntia ficus-indica*, *Tecoma capensis* and *Ailanthus altissima* are given in Chapter 8. In addition, some of the more common exotic shrubs in the PSA nursery, such as *Pittosporum japonica* and *Plumbago auriculata* should be removed.

The planting of species that are either native to Gibraltar or are thought to have been native prior to the Rock's deforestation should follow the removal of exotic shrubs within these two habitats. Species to be used in such replanting programmes should include *Ceratonia siliqua*, *Fraxinus angustifolia*, *Quercus rotundifolia* and *Quercus canariensis*. In addition, exotic trees or shrubs that have died should be felled and replaced with the species listed above. Felled trees should not be removed, but rather left on the ground, as these provide a habitat for a large diversity of invertebrates, as well as reptiles in winter. In this sense, it would probably be best to cut any felled trunks into lengths of one or two metres.

10.4.6 Cliffs

The vegetation of the cliffs of the Upper Rock was not surveyed in this study. However, cliffs are known to be extremely important to plants in Gibraltar. Of Gibraltar's seven endemic plant taxa, six are cliff-loving species. In addition, other plants that are 'special' to Gibraltar due to restricted ranges grow especially well on cliffs. This includes species such as *Petroselinum crispum*, *Succowia balearica* and *Ephedra fragilis*, which have extremely restricted ranges within the area of western Andalusia and Gibraltar (within this area, the first two species are found in Gibraltar alone) (Valdés *et al.* 1987). As such, the cliffs of the Rock constitute an extremely important habitat for the plants of Gibraltar, making a huge contribution to the Rock's biodiversity. In fact, all of the cliffs of Gibraltar fall under one of two EC Habitats Directive priority categories that require the designation of Special Areas of Conservation. These are Vegetated Sea Cliffs of the Mediterranean Coast (with endemic *Limonium* spp.) and Chasmophytic Vegetation of Rocky Slopes (see Chapter 4, section 5).

Any cliffs adjacent to the Upper Rock Nature Reserve that do not fall within the Nature Reserve boundary should be included within a revised boundary. In addition, all cliffs in Gibraltar should be protected as part of a NATURA 2000 site under the EC Habitats Directive.

10.4.7 Management of Garigue Habitats

Most areas of the Upper Rock should be left to develop naturally, so that apart from those sites mentioned above, habitats on the Upper Rock should remain largely untouched. However, some small areas of garigue (including some which at present consist of maquis-garigue) should be managed, so that these do not gradually develop a maquis vegetation. This is because garigue on the Upper Rock, although not extensive, supports a very large proportion of the Nature Reserve's plant diversity (L. Linares, *pers. comm.*). The continued importance of these sites to floral diversity could be undermined if maquis is allowed to develop here, as the taller shrubs would gradually exclude the smaller plants, including the herbaceous species. It is important to realise that many of the plants found on the Upper Rock are found mainly or solely in garigue habitats, and so these should be conserved on this basis.

In particular, garigue areas to be cleared of taller vegetation should include the slope from Governor's Cottage to Levant Battery, which is one of the most floristically diverse areas of the Upper Rock Nature Reserve. In such areas, shrubs removed should include the more common components of the Upper Rock's maquis, such as *Olea europea*, *Rhamnus alaternus*, *Osyris quadripartita* and *Pistacia lentiscus*. Other, smaller shrubs such as *Chamaerops humilis* and *Ephedra fragilis* should not be removed, as these have always formed part of these areas' vegetation, and lend them a very unique aesthetic appeal. In the case of *Ephedra fragilis*, this species also supports a very distinct entomofauna, and the bushes found from Governor's Cottage to Levant Battery in particular hold an important population of the rare buprestid beetle *Buprestis (Yamina) sanguinea*.

The clearing of tall shrubs in garigue habitats should only be carried out by GONHS-supervised personnel.

10.4.8 Ungulates

As mentioned in Chapter 13, one method of habitat maintenance and management would be the introduction of ungulates. It is particularly interesting to note in this respect that the feral goats that currently roam parts of the Upper Rock seem to enjoy feasting on the problematic *Acanthus mollis*. The introduction of wild goats would probably, therefore, cause an impact on the spread and success of this plant. In addition, wild ungulates with browsing habits would help to control and maintain shrubs and bushes in areas that need clearing, such as the firebreaks and the disused water catchment at Rock Gun.

Three possibilities exist for introduction. These are the Spanish ibex *Capra pyrenaica*, the Barbary sheep *Ammotragus lervia* and the roe deer *Capreolus capreolus*. The roe deer is a browser, whilst the Barbary sheep and Spanish ibex would both browse and graze. The acquisition of these and their possible contributions to the Upper Rock Nature Reserve are discussed fully in Chapter 13.

Apart from helping to manage and maintain habitats, the presence of ungulates in the Nature Reserve would enhance the aesthetic appeal of the Upper Rock for tourists and locals who are keen on observing wildlife.

10.4.9 Habitat Management

The task of managing the vegetation of the Upper Rock as described above is one that is not extremely intensive (given that most of the Nature Reserve's vegetation requires little or no management), but which needs constant, year-round attention. In this sense, it would be desirable to employ a team of 10-12 persons in order to address all aspects of management of the Upper Rock's vegetation. This would include the clearing of the firebreaks and roadsides, management of garigue habitats, clearing and management of the disused water catchments at Rock Gun, control and eradication of exotic flora within the Upper Rock, removal of exotic species from the PSA and Mount Gardens and the replanting, maintenance and care of native species at these two sites. This team should be trained and supervised by GONHS personnel, and should carry out their works in accordance with the guidelines set out in this report. The responsibilities of this team of workers could easily be combined with matters that do not relate to habitat management, as described in the Action Plan (Chapter 24).

10.5 Recommendations

1) Most areas of high maquis, the habitat that dominates on the Upper Rock, should be left to develop naturally.

2) Every effort should be made to control the aggressive species *Acanthus mollis*. This should particularly be the case in open areas, where this species has only recently established itself, and where its impact to other species is greatest. This could be carried out using a herbicide that contains glyphosphate. If this is done, then care must be taken not to eliminate surrounding plants in the process. Alternatively, open areas can be cleared of *A. mollis* manually during the early spring. The introduction of large herbivores, as described in Chapter 13 and section 10.47, would almost certainly cause an immediate negative impact on the success of this plant.

3) Research on the reasons behind the recent success of *Acanthus mollis* in Gibraltar would be greatly welcomed, as the findings would go a long way towards determining suitable methods of control.

4) Firebreaks should be cleared annually using the methods highlighted in Chapter 11.

5) Roadsides should be cleared annually, but only using the guidelines stated in Linares (1997), which are explained in Chapter 5. This will help to maintain the Upper Rock's floral diversity. Given that open areas are being lost, and that even some matorral species now find their strongholds on roadsides, it would also be useful to widen the area of vegetation cleared on roadsides so that three or four metres remain clear on each side of the road. This is also stated in Chapter 5.

6) The disused water catchment at Rock Gun requires immediate habitat management if it is to remain an area of importance to plants and animals of open, rocky areas. All trees and woody shrubs should be removed from this area. The introduction of ungulates to this area would help to maintain the vegetation permanently low. This is discussed in more detail in Chapter 18 and in Bensusan & Perez (2003).

7) The removal of exotic species from both woodland sites (PSA gardens & the Mount) would be an important step in the restoration of the last vestiges of Gibraltar's original woodland habitat. Particularly important is the removal of *Ailanthus altissima* from both sites, as this species spreads extremely quickly through seeds and suckers and excludes native species. The control of *A. altissima* is discussed fully in Chapter 8, section 7.

8) Planting programmes should take place at both woodland sites. Ideally, each exotic tree removed should be replaced with a native tree. Species suitable for replanting are *Quercus rotundifolia*, *Q. canariensis*, *Fraxinus angustifolia*, *Laurus nobilis* and *Ceratonia siliqua*. In addition, there is much scope for replanting at the PSA nursery (in addition to the replacement of exotic species with native ones) where an example of Mediterranean woodland could be planted and managed.

9) The PSA nursery should continue being utilised as a site at which to propagate native species. This is already being carried out by a group of GONHS volunteers, who have grown hundreds of saplings that are suitable for replanting on the Upper Rock. Significantly, this includes many pines, which could be used to replace those that have died (see Chapter 9).

10) All cliffs surrounding the Upper Rock Nature Reserve should be included within the Nature Reserve boundary. Many of these cliffs are already included, but the boundary around cliffs is not clearly defined. In addition, all cliffs in Gibraltar should be designated as Special Areas of Conservation under the EC Habitats Directive.

11) Garigue habitats are amongst the most important areas for flora on the Upper Rock. Therefore, these should be managed to prevent them from developing into maquis. Woody shrubs such as *Olea europea*, *Rhamnus alaternus*, *Pistacia lentiscus* and *Osyris quadripartita* should be removed from these areas, as well as from areas that are currently composed of Maquio-garigue. As ever, GONHS should be consulted before any removal takes place.

12) The introduction of ungulates to the Upper Rock Nature Reserve could prove an effective measure in controlling and maintaining the vegetation of the Upper Rock. This is discussed fully in Chapter 13.

13) A team of 10-12 persons should be employed to tackle every aspect of habitat management within the Nature Reserve. This would include the clearing of firebreaks, roadsides and disused water catchments, the control and eradication of exotic flora and replanting programmes. This team could also tackle other aspects of Nature Reserve management, such as the clearing of pathways, etc. The team should be trained and supervised by GONHS personnel.



Southern polypody, a fern of shady areas of the Upper Rock.

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11. Fire and Firebreaks

11. Fire and Firebreaks

The Upper Rock can become extremely dry during the summer months, and the abundance of dry vegetation during this period makes fires a very definite possibility. Indeed, several large fires have occurred on the Upper Rock, the most recent of which took place during the summer of 1988. Therefore, precautions against fires are extremely important both to the residents of the Upper Rock and to the many thousands of tourists who visit the Nature Reserve every year, as well as to the wildlife of the area.

In spite of the threat that fire causes, not enough precautionary measures are taken to ensure that the risk of fire on the Upper Rock is minimal. A series of firebreaks exists on the Upper Rock Nature Reserve in order to contain any fire to specific areas and limit the spread of the same. However, firebreaks are not cleared as regularly as they should be and some are not cleared at all, as shall be seen later. In addition to this, the visitor is not made adequately aware of the dangers that some of their actions may pose to the Upper Rock during the summer months. Very few signs warning of the danger of fires remain, and the abundance of litter, which includes glass and tin aggravate what is already a serious threat.

11.1 Location of Firebreaks

The location of the firebreaks found on the Upper Rock Nature Reserve can be seen in Fig. 1.

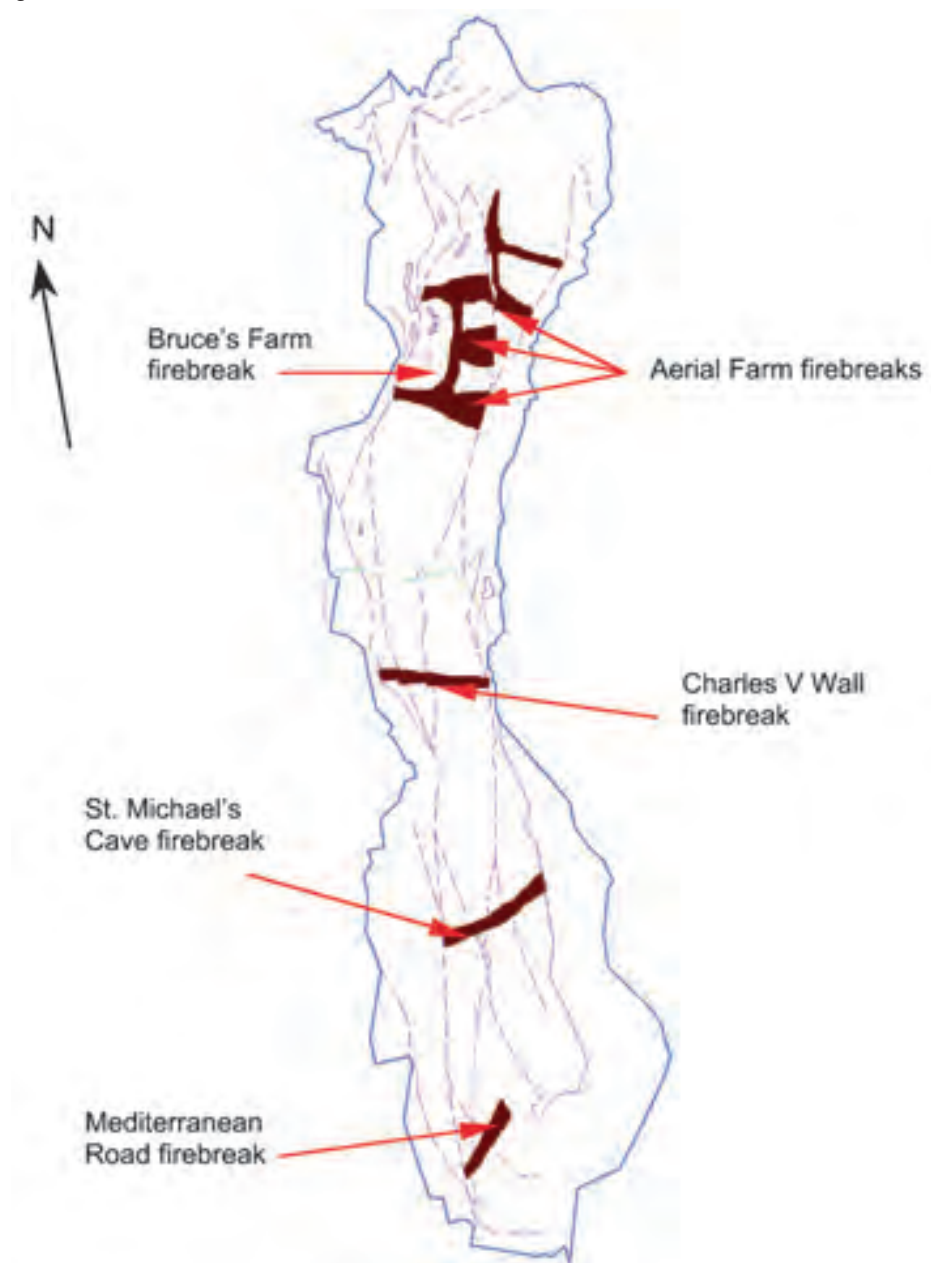


Figure 1. Map of Upper Rock Nature Reserve showing location of firebreaks.

Fig. 1 shows that firebreaks are spread out along the length of the Nature Reserve, with the highest concentration at the MOD aerial farm towards the northern end of the Reserve. These are in fact the best-maintained firebreaks on the Upper Rock. The three southernmost firebreaks are cleared from time to time, but not as regularly as they used to be, or indeed should be if they are to prove effective in the event of fire (A. Almeida, *pers. comm.*). The firebreak behind the Bruce's Farm residential area (labelled 'Bruce's Farm firebreak' on our map) has not been cleared for a number of years.

Firebreaks on the Upper Rock have different histories. Whilst those at Mediterranean Road, St. Michael's Cave, Charles V Wall and Bruce's Farm were created to control the spread of fire generally, those that are found within the MOD's aerial farm are there to protect the military installations and property. It is therefore likely that as these installations are dismantled or vacated, these firebreaks will cease to exist unless responsibility for their maintenance is assumed by the Government.

11.2 Flora and Fauna of the Firebreaks

The firebreaks on the Upper Rock are also extremely important for indigenous flora. They provide large clearings among the dense maquis that covers most of the Nature Reserve, a habitat that limits light penetration to the ground cover resulting in a limited growth of annuals (Linares 1997). Firebreaks therefore help to maintain the impressive diversity of plants found on Gibraltar, and 37% of the Rock's flora (213 species) can be found in these areas (Linares 1994). Some of the plants that grow on the firebreaks grow nowhere else in Gibraltar. Others, although not found exclusively on the firebreaks, find their main populations in these areas. Table 1 illustrates this.

Table 1. Plants that grow mainly or exclusively on the firebreaks. These are categorised as either only or mainly on the third column (taken from Linares 2003).

Species	Common Name	Only or Mainly
<i>Ajuga iva</i>	lesser ground pine	Mainly
<i>Bellardia trixago</i>	bellardia	Mainly
<i>Campanula rampunculus</i>	rampion	Only
<i>Centaurium pulchellum</i>	lesser centaury	Only
<i>Cuscuta planiflora</i>	dodder	Mainly
<i>Daphne gnidium</i>	Mediterranean mezereon	Mainly
<i>Euphorbia exigua</i>	dwarf spurge	Mainly
<i>Euphorbia pterococca</i>		Only
<i>Hypericum perforatum</i>	common St. John's wort	Only
<i>Logfia gallica</i>	narrow-leaved cudweed	Only
<i>Medicago tornata</i>		Mainly
<i>Nepeta tuberosa</i>	greater catmint	Only
<i>Ononis pubescens</i>	hairy restharrow	Mainly
<i>Ononis viscosa ssp. subcordata</i>	sticky restharrow	Mainly
<i>Ophrys fusca ssp. fusca</i>	brown-bee orchid	Mainly
<i>Ophrys lutea ssp. lutea</i>	yellow-bee orchid	Mainly
<i>Orobanche sanguinea</i>		Mainly
<i>Parentucellia viscosa</i>	yellow bartsia	Mainly
<i>Pulicaria odora</i>	fleabane	Only
<i>Sideritis arborescens ssp. arborescens</i>	shrubby sideritis	Only
<i>Trifolium glomeratum</i>	clustered clover	Only
<i>Dulia geniculata</i>		Mainly

Firebreaks are also important for the fauna of the Upper Rock Nature Reserve. Barbary Partridges *Alectoris barbara*, (which are endangered in Europe (Tucker & Heath 1994) and are a Schedule 3 species under the 'Nature Protection Ordinance, 1991' (L/N 11 of 1991)) require open areas in order to survive, and this habitat is becoming less common on the Upper Rock. Similarly, rabbits *Oryctolagus cuniculus*, favour open ground, and the clearing of firebreaks is important to their survival within the Upper Rock Nature Reserve. This is also the case for bats, most reptile species (see Cortes 1982) and invertebrates, being particularly important for phytophagous insects due to the floristic diversity that such areas harbour. Rabbits, bats, reptiles and many species of butterfly that use these sites are protected under Schedule 1 of the 'Nature Protection Ordinance, 1991'.

Despite being of such importance to the fauna and flora of the Nature Reserve, nowadays most of the firebreaks on the Upper Rock are not managed properly, and shrubs and small trees now grow on the majority of the firebreaks that are no longer cleared. Nowhere is this more evident than on the firebreak above the Bruce's Farm area (which is actually the firebreak that is richest in flora) where woody vegetation now reaches shoulder height, as seen in Fig. 2.



Figure 2. The vegetation on the Bruce's Farm firebreak has grown to such an extent that woody plants, some of which reach shoulder height, now dominate it.

If the vegetation on this firebreak continues to grow, the area will eventually lose its importance to indigenous flora. Furthermore, the development of a canopy over this until now open area may facilitate the spread of the exotic invasive *Senecio angulatus*, which already grows profusely in the Bruce's Farm area and the PSA nursery (see Chapter 8, section 8.1), into areas within and beyond the firebreak.

11.3 Fire and Firebreaks

In an interview, Divisional Officer of Operations and Training, Gibraltar City Fire Brigade Mr Tony Almeida expressed serious concerns regarding the threat of fire on the Upper Rock. In particular, Officer Almeida expressed the view that firebreaks are not cleared nearly as often as they should be, and added that the City Fire Brigade had expressed concern about this in the past to the management of the Upper Rock Nature Reserve, the Gibraltar Tourist Board. Officer Almeida also made reference to residential areas, highlighting that these are all surrounded by thick vegetation, and that none of these are protected by firebreaks. This is of particular concern given that some of the older buildings are constructed partly from timber. Particular reference was made to the Bruce's Farm residential area, and the fact that the firebreak surrounding these buildings has become extremely dense and now poses a threat. Surrounding vegetation should therefore be cut back around these buildings to provide firebreaks.

11.4 The Gibraltar City Fire Brigade and the Upper Rock Nature Reserve

The following is based on information received during an interview with Officer Tony Almeida of the Gibraltar City Fire Brigade.

The City Fire Brigade considers that there are two main seasons throughout the year, in terms of the threat of fire on the Upper Rock. These are the low-risk season (from the end of October to the end of May) and the high-risk season (from late May to late October). No checks are carried out on the Upper Rock during the low-risk season. During the high-risk season, the Upper Rock is divided into three main routes, and each one is checked every three weeks. Checks are always carried out on Fridays, and hydrants, tanks, general equipment and hazards are checked on every inspection. A report is produced that is sent to the Gibraltar Tourist Board, which manages the Nature Reserve. This report highlights all fire hazards identified, and suggests improvements to lessen the chances of fire.

The Fire Brigade has a contingency plan in case of fire on the Upper Rock. As soon as there is any indication of a fire within the Nature Reserve, all traffic is stopped at the Casino, and within the Nature Reserve, traffic is moved either on along the road or back towards the entrance, always away from the fire. Help from the cable car is also available to transport

equipment, etc. However, accessibility to the Upper Rock Nature Reserve during peak traffic hours is of grave concern to the Fire Brigade. Whereas before 10am it will only take a few minutes for a fire engine to reach the Upper Rock, this will take substantially longer during later hours of the day given that traffic can be heavy at times, and that roads within the Nature Reserve are narrow and unsuitable to clear such heavy traffic in the event of a fire. The fact that tour operators visit the Upper Rock more often during the high-risk season makes the situation particularly worrying. There are some traffic bottlenecks within the Nature Reserve that are of particular concern to the Fire Brigade, namely St. Michael's Cave, Jews' Gate, Prince Phillip's Arch and to a lesser extent Princess Caroline's Battery.

The Fire Brigade considers that vandalism is a problem within the Nature Reserve, particularly at night. City Fire Brigade equipment on the Upper Rock, such as water tanks, is frequently vandalised. When water tanks were filled with fresh water, people often used this water to wash their cars, with little regard to the dangers that this might pose. Due partly to vandalism, the supply of water hydrants within the Reserve is less than adequate. Many of these are not in a fit state, and it is unclear whom they belong to in any case (i.e., whether they belong to the MOD or the Government of Gibraltar). These should be replaced with fibreglass tanks, which would prove cheaper to maintain. The largest water tank within the Nature Reserve is found at Mount Misery, but the water level was down to about 50%, although the problem is being addressed (at 28/4/03). The supply of water to the Nature Reserve is the responsibility of the Government of Gibraltar.

There should be more signs on the Upper Rock making people aware of possible fire hazards. Cigarette ends and items of discarded litter such as shards of glass and tins can all cause fire. The litter problem on the Upper Rock aggravates the situation, and as a result the number of fire hazards on the Upper Rock is currently higher than it should be. Likewise, derelict cars, some of which can be found within the Nature Reserve, are of some concern. Whilst a smoking ban within the Reserve would be impossible to police, people should be advised or encouraged not to smoke by being made aware of the dangers that this may pose. The density of some of the vegetation on the Upper Rock, and in particular dry vegetation during the summer months is of concern to the Fire Brigade, which would favour a policy of vegetation clearing in some areas.

In addition to fires, the City Fire Brigade also carries out rescues, including cliff rescues, and has a small team that is trained for these purposes. In the event of a fire on the Upper Rock, the whole Fire Brigade Staff is called in, as is the Services Fire Brigade. As long as there are sufficient fire-fighting capabilities, half the battle is won, so availability and protection of equipment within the Nature Reserve is particularly important.

11.5 Management of the Firebreaks

Originally, all firebreaks within the Upper Rock Nature Reserve were managed by the MOD. This is no longer the case, and the MOD now clear only those firebreaks that form part of the aerial farm at Rock Gun and Middle Hill. This will presumably cease after 2004 as these areas are being handed over to the Gibraltar Government. The firebreak at Bruce's Farm, which at present falls within MOD land (see Bensusan & Perez 2003, and Chapter 10, section 10.33), is no longer cleared, and as such has developed dense, woody vegetation such as has already been described. The rest of the firebreaks on the Upper Rock fall under the responsibility of the management of the Upper Rock Nature Reserve, the Gibraltar Tourist Board.

11.6 Clearing of the Firebreaks

It is the authors' view and that of the City Fire Brigade, that firebreaks on the Upper Rock are mismanaged. This is especially the case with regard to those that are the responsibility of the Government of Gibraltar, but the state of the Bruce's Farm firebreak, which currently belongs to the MOD, is particularly worrying. The responsibility for maintaining these firebreaks will soon pass to the Gibraltar Government. All firebreaks should be cleared every year. Furthermore, the timing for clearing the firebreaks is crucial to the maintenance of floral diversity at these sites. The majority of the important plant species found on firebreaks will have gone to seed by the middle of July (this may vary somewhat depending on the length of the rainy season), and so clearing should not take place before this time (Linares 1997). This in fact ties in with the beginning of the high-risk season as defined by the City Fire Brigade.

Most of the important plants grow in fairly well defined areas within the firebreaks, and so with the right instruction and direction, clearing can begin sooner than mid-July, providing that these areas are avoided and left until the end. Linares (1997) highlights that if a certain order is adhered to, the clearing of the firebreaks can begin as early as the beginning of June without endangering any species. The order of clearing recommended by Linares (1997) is given next.

- 1st St. Michael's Cave firebreak and sections A, B, C and D of Bruce's Farm firebreak, in that order (Bruce's Farm firebreak sections are shown in Fig. 3).
- 2nd Charles V Wall firebreak.
- 3rd Mediterranean Road firebreak
- 4th Sections E to G of Bruce's Farm firebreak (as shown in Fig. 3). These are the most important areas for plants on any of the firebreaks, and should be cleared in alphabetical order (E, F, G).

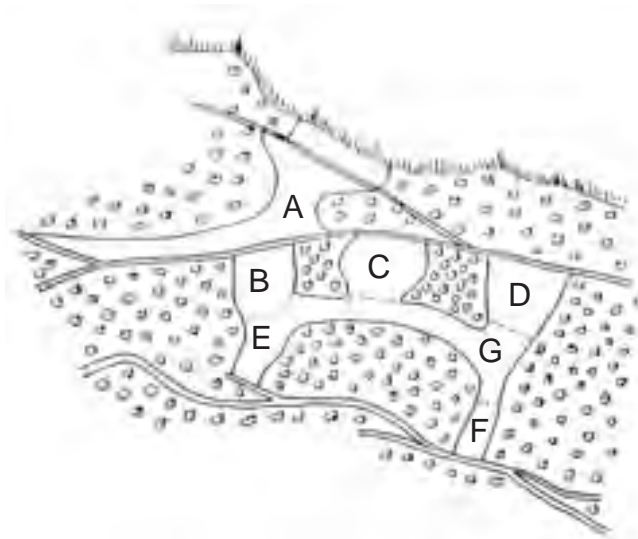


Figure 3. Diagram of the firebreak and aerial farm above Bruce's Farm. This is divided into seven sections, A-G, which should be cleared in succession to ensure the maintenance of the site's floral diversity (taken from Linares 1997).

When this clearing takes place, it is important that all woody vegetation be removed. The amount of woody vegetation varies from one firebreak to another. Some have little, whilst others, in particular the Bruce's Farm firebreak, are covered in bushes and small trees, namely *Calicotome villosa*, *Coronilla valentina*, *Olea europea*, *Osyris quadripartita*, *Pistacia lentiscus*, *Pistacia terebinthus*, *Rhamnus alaternus*, *Rhamnus lycioides* and *Genista linifolia*. These should be cut down, with stumps treated with a wood killer such as SBK to prevent these from sprouting again. The rest of the vegetation can be cleared with the use of rakes or shears, but care should be taken not to remove the topsoil, as this contains both the nutrients and the seeds that are necessary for the continued survival of interesting plant communities (Linares 1997). It is also important that the shrubs and bushes on the fringes of the firebreaks be cut back when firebreaks are being cleared, as these are encroaching on the open areas with the result that firebreaks, even when cleared, are gradually becoming smaller and smaller.

Further to the clearing of firebreaks, an effort should be made to open up the vegetation in some areas. This would lessen the threat of fire in these areas, and would assist the development of the vegetation and promote floral diversity within the Nature Reserve. It would also be useful to introduce ungulates such as Spanish ibex *Capra pyrenaica*, or Barbary sheep *Ammotragus lervia*, to keep vegetation down on the firebreaks once these have been adequately cleared, as is also discussed in Chapter 13. This should in no way detract the importance of the maquis, which is a unique habitat not only in Gibraltar but also in southern Iberia, where the existence of this type of vegetation is relatively unique to the Rock.

11.7 Recommendations

- 1) The visitor to the Upper Rock Nature Reserve should be made more aware of the dangers of fire within the reserve. Signs should be erected highlighting that the deposition of matches, cigarette ends, glass bottles, tin cans, etc., all pose a serious fire hazard. Visitors to the Nature Reserve should be encouraged not to smoke, particularly during the summer months.
- 2) Collection and clearing of litter should be more effective to ensure that glass, tin and other objects that could pose a fire risk do not accumulate and are removed promptly.
- 3) Those firebreaks that currently exist within the MOD's aerial farm should not cease to exist once the military installations at these sites have fallen out of use. Rather, these should continue to be cleared by the managers of the land, be they the MOD or the Government of Gibraltar. This would be beneficial to both fire safety and the maintenance of biodiversity within the Nature Reserve.
- 4) Traffic on the Upper Rock is of some concern to fire safety. If a fire occurs during peak

hours, the heavy congestion of traffic at certain bottlenecks within the Nature Reserve will cause problems; it will make access difficult for the fire Brigade and will also make a quick evacuation of the Upper Rock problematic. This is just one of the reasons why the traffic problem within the reserve, including the use of the upper roads, needs to be tackled.

5) There is an insufficient number of water hydrants in some areas of the Upper Rock, and this should be increased in order to tackle large fires effectively.

6) Water tanks within the Nature Reserve are sometimes vandalised, rendering these useless. What is more, they are rarely replaced. Any damaged tanks should be replaced with fibreglass tanks, which would prove cheaper to maintain.

7) All firebreaks on the Upper Rock should be cleared on an annual basis. This is particularly important in the case of the Bruce's Farm firebreak, which has not been cleared for many years now and which was originally intended to protect a still active residential area from the threat of fire. As land owners within the Nature Reserve, the MOD should not be any less responsible for the safety of residents and visitors than the Government of Gibraltar, and as such should ensure that all of the firebreaks within their land, including the Bruce's Farm firebreak are cleared effectively on an annual basis.

8) Shrubs and bushes growing along the edges of the firebreaks should be cut back annually to ensure that these do not encroach on the firebreaks, reducing their size as they currently do.

9) Firebreaks should be cleared during the time of the year highlighted above, and in the sequence described in detail above.

10) In relation to the risk of fire on the Upper Rock the authors propose an 'Upper Rock Disaster Exercise' whereby the pertinent authorities would put into practice their Upper Rock Disaster Plan and enable the necessary planned infrastructure and strategy to tackle a major fire, serious traffic accident or any other serious incident that may occur on the Upper Rock. This exercise would highlight the problems and deficiencies, and enable the authorities to provide solutions in the event of a real disaster.



yellow-bee orchid

Leslie Linares / GONHS

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12. Birds

Gibraltar Neanderthals

12. Birds

The Upper Rock Nature Reserve boasts an impressive diversity of birds. This is largely due to its geographical position; the Strait of Gibraltar provides the most important bottleneck for migrating birds in Western Europe. An estimated 250,000 raptors cross the Strait in a season, and many passerines and near-passerines use the Rock as a stop-over site (Heath & Evans 2000). The number of these that cross the Strait undoubtedly exceeds that of soaring birds by many thousands (Moreau 1961). As well as this, a number of species that BirdLife International deem to be of European conservation concern (SPECs) breed regularly within the Upper Rock. These include the lesser kestrel *Falco naumanni*, which is of global conservation concern (Tucker & Heath 1994; Heath & Evans 2000). This chapter highlights the importance of the Upper Rock Nature Reserve to both migrant and resident birds and discusses the challenges that these species face within the Nature Reserve.

12.1 Directives and Conventions

In addition to local legislation, several international conventions relevant to birds have been ratified by the United Kingdom Government on behalf of Gibraltar, and European Union Directives and Regulations also apply here (Heath & Evans 2000). The following all apply to Gibraltar (as given by Heath & Evans 2000):

- ‘Biodiversity Convention: Convention on Biological Diversity (CBD)’. This convention has three objectives, namely the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the use of genetic resources. This convention applies not only to birds, but also to all other forms of life.

- ‘Bonn Convention: Convention on the conservation of migratory species of wild animals (CMS)’. This aims to protect migratory species in recognition of the fact that these species need adequate protection throughout all parts of their migratory range if they are to be conserved, and that this requires international cooperation and action. Again, all migratory species, not just birds, are included under this convention. In Gibraltar, this would include birds, butterflies and moths, dragonflies, fish, marine turtles and cetaceans.

- ‘EC Birds Directive’: Council Directive on the conservation of wild birds (79/409/EEC). This Directive concerns the conservation and protection of all wild bird species in the European territory of the Member States of the European Union. All member states are committed to providing a variety of habitats and to preserve, maintain or restore an adequate proportion of these for all wild bird species in their territory. The number and the area of habitats to be designated as Special Protection Areas should be determined on the basis of the protection requirements and the conservation status of the species involved. One of the requirements of this Directive is the classification of Special Protected Areas that are considered the most suitable for the conservation of species or subspecies listed under Annex 1 of the Directive. These species include the lesser kestrel *Falco naumanni*, peregrine *Falco peregrinus* and Barbary partridge *Alectoris barbara*, all of which breed within the Nature Reserve. In addition to this, many of the migrant birds that occur within the Upper Rock are listed under Annex 1 of the Directive, and as such the Nature Reserve merits classification on this basis.

- ‘EC Habitats Directive’: Council Directive on the conservation of natural habitats of wild fauna and flora (92/43/EEC). The main aim of this Directive is to create a coherent ecological network (Natura 2000) of Special Areas for Conservation (SACs), setting a minimum standard for biodiversity conservation within the EU. The network should be designed to maintain the distribution and abundance of threatened species and habitats, and member states are required to take necessary and appropriate conservation measures for SACs. Member states are required to avoid significant disturbance and habitat deterioration within SACs. Any plans within or around SACs are also to be considered in accordance to the aims of the Natura 2000 Network, and works that affect the integrity of these networks should not be considered.

- ‘World Heritage Convention: Convention concerning the Protection of the World Cultural and Natural Heritage’. The aim of the World Heritage Convention is the protection of natural and cultural areas of outstanding universal value. The Convention imposes a legal duty on each party to do its utmost to protect designated sites.

12.2 How are these applied in the Gibraltar?

Although the Government of Gibraltar is committed to those directives and conventions listed above, most of these have so far not been fully implemented. Most of the provisions of the Birds Directive were incorporated into the Nature Protection Ordinance (1991), but no "special protection areas" (SPAs) have yet been declared; and for example, although the Habitats Directive was transposed into Gibraltar law in 1995 (L/N118/95), nevertheless 'special areas of conservation' (SAC's) have not yet been designated. In fact, the European Union has considered initiating infraction proceedings against the United Kingdom due to the lack of implementation of the EC Habitats Directives, 'Natura 2000' Network in the UK, including specifically Gibraltar (given that Gibraltar is a member of the EU under the UK). This has prompted the Government of Gibraltar to initiate once again the implementation of this aspect of the Directive, although progress on this and on similar requirements relating to its sister Directive, the EC Birds Directive, had so far been slow. Similarly, no significant measures have been taken to conserve Gibraltar's biodiversity in accordance with the Biodiversity Convention. However, an effective implementation of the Habitats Directive that designates a wide cross-section of the habitats found in Gibraltar under the 'Natura 2000' Network, which also covers the requests of the Birds Directive, would also be seen as a measure taken in the spirit of the Biodiversity Convention, thus killing two (proverbial) birds with one stone.

The World Heritage Convention is similarly not adhered to. Both cultural and natural heritage, both within the Upper Rock and outside, are largely neglected. Historic buildings and sites within the Nature Reserve are largely in a state of neglect (except in a few cases where they provide direct money-earners for the management of the reserve), and a management plan for the natural aspects of the Upper Rock simply does not yet exist. This last point in particular is rather striking, given that the Upper Rock is after all a *Nature Reserve*, and was designated without any appropriate plan.

The only convention that can be said to have been implemented is the Bonn Convention, which aims to protect migratory species (be they birds or others) throughout the whole of their ranges. This convention has been implemented in that all migratory birds and cetaceans are protected in Gibraltar (in fact, all birds are protected in Gibraltar) under the 'Nature Protection Ordinance, 1991' (L/N 11 of 1991)), and should any illegal action be taken against such birds, this would no doubt result in prosecution.

12.3 International Importance of Gibraltar for Birds

The whole 600 ha. that comprise the Rock of Gibraltar is considered an Important Bird Area by BirdLife International, being classed as Gibraltar IBA 001 (the Strait is Gibraltar's second IBA, 002). It is important to stress that sites selected as IBAs have true significance for the international conservation of bird populations (Heath & Evans 2000). The criteria for international importance of IBAs is as follows:

- A = site of global importance
- B = site of European importance
- C = site of importance within the EC

Gibraltar is afforded the IBA criteria A1, A4iv, B1iv, B2, C1 and C5* (Heath & Evans 2000).

12.4 Migrants

The Rock of Gibraltar, and in particular the Upper Rock Nature Reserve is dominated by a dense cover of mostly maquis, with some garrigue, and these habitats include many important fruit-bearing shrubs that support large passerine populations during passage periods and in winter (Heath *et al.* 2000). The slopes of the Rock also serve as a staging site for large numbers of passerine and near-passerine migrants. Most migratory western European species can occur at Gibraltar during the northward or southward migration periods (Cortes 1996). The passerine and near-passerine species that occur within the Nature Reserve on migration are listed in table 1, which shows that a number of these birds have an unfavourable conservation status within Europe.

In addition, many migratory birds of prey and storks congregate at the Strait of Gibraltar on their way towards their wintering grounds in Africa. When westerly winds blow across the Strait, Gibraltar itself sees the majority of raptor passage during both the pre-nuptial (northerly) and post-nuptial (southerly) migrations, and most of these birds fly directly over the Upper Rock Nature Reserve. The species that can be observed over the Rock on migration are listed in table 2. It is interesting to note, as can be observed from the table, that most of these birds have an unfavourable conservation status.

During the post-nuptial passage, when prolonged easterlies create windy, cloudy conditions, large congregations of raptors often form on the northern shore of the strait. The most

* A1= The site regularly holds significant numbers of a globally threatened species, or other species of global concern.

A4iv= The site is known or thought to be a 'bottleneck' site where at least 20,000 storks (Ciconiidae) raptors (Accipiteriformes and Falconiformes) or cranes (Gruidae) regularly pass during spring or autumn migration.

B1iv= The site is a 'bottleneck' where over 5,000 storks, or over 3,000 raptors or cranes regularly pass on spring or autumn migration.

B2= The site is one of the 'n' most important in the country for a species with an unfavourable conservation status in Europe (SPEC 2, 3) and for which the site protection approach is thought to be appropriate.

C1= This site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.

C5= The site is a 'bottleneck' site where at least 5,000 storks and/or at least 3,000 raptors and/or 3,000 cranes regularly pass on migration.

(Taken from Heath *et al.* (2002).)

noticeable species during these periods is the booted eagle *Hieraaetus pennatus* (a bird with an unfavourable conservation status (Tucker & Heath 1994)), of which flocks of several hundred birds can occur, but many other species are also common. During these days, a varying number of birds, particularly booted eagles and Eurasian sparrowhawks *Accipiter nisus* roost on the Rock, particularly on taller trees such as those that line many of the roads. It is useful to point out that the number of birds roosting on the Rock has decreased substantially since the Upper Roads have been used by ordinary traffic, contrary to the requirements of what are rare and declining birds.



Eurasian sparrowhawk



Barbary partridge

John Cortes / GONHS

Table 1. Migrant passerines and near-passerines of the Upper Rock Nature Reserve, together with their frequency of occurrence and conservation status and category attributed to them by BirdLife International.

Common Name	Scientific Name	Frequency of Occurrence	SPEC Category	European Threat Status
stone curlew	<i>Burhinus oedicanus</i>	O	3	V
woodpigeon	<i>Columba palumbus</i>	O	4	S
turtle dove	<i>Streptopelia turtur</i>	R	3	D
great spotted cuckoo	<i>Clamator galandrius</i>	R		S
common cuckoo	<i>Cuculus canorus</i>	O		S
European scops owl	<i>Otus scops</i>	R	2	D
common nightjar	<i>Caprimulgus europaeus</i>	R	2	D
red-necked nightjar	<i>Caprimulgus ruficollis</i>	R		S
common swift	<i>Apus apus</i>	R		S
pallid swift	<i>Apus pallidus</i>	R		S
alpine swift	<i>Apus melba</i>	R		S
European bee-eater	<i>Merops apiaster</i>	R	3	D

CONTINUE >>

Common Name	Scientific Name	Frequency of Occurrence	SPEC Category	European Threat Status
European roller	<i>Coracias garrulus</i>	O	2	D
Eurasian hoopoe	<i>Upupa epops</i>	R		S
Eurasian wryneck	<i>Jynx torquilla</i>	R	3	D
short-toed lark	<i>Calandrella brachydactyla</i>	R	3	V
woodlark	<i>Lullula arborea</i>	O	2	V
common skylark	<i>Alauda arvensis</i>	R	3	V
sand martin	<i>Riparia riparia</i>	R	3	D
crag martin	<i>Ptyonoprogne rupestris</i>	R		S
barn swallow	<i>Hirundo rustica</i>	R	3	D
red-rumped swallow	<i>Hirundo daurica</i>	R		S
house martin	<i>Delichon urbica</i>	R		S
tawny pipit	<i>Anthus campestris</i>	R	3	V
tree pipit	<i>Anthus trivialis</i>	R		S
meadow pipit	<i>Anthus pratensis</i>	R	4	S
yellow wagtail	<i>Motacilla flava</i>	R		S
grey wagtail	<i>Motacilla cinerea</i>	R		S
white wagtail	<i>Motacilla alba</i>	R		S
rufous bush robin	<i>Cercotrichas galactotes</i>	O		S
European robin	<i>Erithacus rubecula</i>	R	4	S
common nightingale	<i>Luscinia megarynchos</i>	R	4	S
black redstart	<i>Phoenicurus ochruros</i>	R		S
common redstart	<i>Phoenicurus phoenicurus</i>	R	2	V
whinchat	<i>Saxicola rubetra</i>	R	4	S
stonechat	<i>Saxicola torquata</i>	R	3	D
northern wheatear	<i>Oenanthe oenanthe</i>	R		S
black-eared wheatear	<i>Oenanthe hispanica</i>	R	2	V
rock thrush	<i>Monticola saxatilis</i>	O	3	D
ring ouzel	<i>Turdus torquatus</i>	R	4	S
Song thrush	<i>Turdus philomenos</i>	R	4	S
redwing	<i>Turdus iliacus</i>	R	4	S
zitting cisticola	<i>Cisticola juncidis</i>	R		S
grasshopper warbler	<i>Locustella naevia</i>	R	4	S
sedge warbler	<i>Acrocephalus schoenobaenus</i>	O	4	S
European reed warbler	<i>Acrocephalus scirpaceus</i>	R	4	S
olivaceous warbler	<i>Hippolais pallida</i>	O	3	V
melodius warbler	<i>Hippolais polyglotta</i>	R	4	S
Dartford warbler	<i>Sylvia undata</i>	R	2	V
spectacled warbler	<i>Sylvia conspicillata</i>	R		S
subalpine warbler	<i>Sylvia cantillans</i>	R	4	S
Orphean warbler	<i>Sylvia hortensis</i>	R	3	V
common whitethroat	<i>Sylvia communis</i>	R	4	S
garden warbler	<i>Sylvia borin</i>	R	4	S
blackcap	<i>Sylvia atricapilla</i>	R	4	S
western Bonelli's warbler	<i>Phylloscopus bonelli</i>	R	4	S
wood warbler	<i>Phylloscopus sibilatrix</i>	O	4	S
common chiffchaff	<i>Phylloscopus collybita</i>	R		S
willow warbler	<i>Phylloscopus trochilus</i>	R		S
firecrest	<i>Regulus ignicapillus</i>	R	4	S
spotted flycatcher	<i>Muscicapa striata</i>	R	3	D
pied flycatcher	<i>Ficedula hypoleuca</i>	R	4	S
Short-toed treecreeper	<i>Certhia brachydactyla</i>	O	4	S
golden oriole	<i>Oriolus oriolus</i>	R		S
woodchat shrike	<i>Lanius senator</i>	R	2	V
Spanish sparrow	<i>Passer hispaniolensis</i>	O		S

CONTINUE >>

Common Name	Scientific Name	Frequency of Occurrence	SPEC Category	European Threat Status
chaffinch	<i>Fringilla coelebs</i>	R	4	S
brambling	<i>Fringilla montifringilla</i>	O		S
European serin	<i>Serinus</i>	R	4	S
greenfinch	<i>Carduelis chloris</i>	R	4	S
goldfinch	<i>Carduelis carduelis</i>	R		S
siskin	<i>Carduelis spinus</i>	R	4	S
linnet	<i>Carduelis cannabina</i>	R		S
common crossbill	<i>Loxia curvirostra</i>	O		S
Ortolan bunting	<i>Emberiza hortulana</i>	R	2	V

Frequency of Occurrence:

R = regular (every year)

O = occasional

SPEC category (Taken from Tucker & Heath (1994)):

1 = species of global conservation concern

2 = concentrated in Europe and with an unfavourable conservation status

3 = not concentrated in Europe but with an unfavourable conservation status

4 = concentrated in Europe and with a favourable conservation status

European Threat Status (Taken from Tucker & Heath (1994)):

E = Endangered

V = Vulnerable

D = Declining

R = Rare

S = Stable

Table 2. Raptor, stork and crane species that can be seen from the Upper Rock Nature Reserve on migration, together with their frequency of occurrence and conservation status and the category attributed to them by BirdLife International (which follow those of table 1).

Common Name	Scientific Name	Frequency of Occurrence	SPEC Category	European Threat Status
black stork	<i>Ciconia nigra</i>	R	3	R
white stork	<i>Ciconia ciconia</i>	R	2	V
honey buzzard	<i>Pernis apivorus</i>	R	4	S
black-winged kite	<i>Elanus caeruleus</i>	O	3	V
black kite	<i>Milvus migrans</i>	R	3	V
red kite	<i>Milvus milvus</i>	R	4	S
griffon vulture	<i>Gyps fulvus</i>	R	3	R
cinereous vulture	<i>Aegypius monachus</i>	O	3	V
short-toed eagle	<i>Circaetus gallicus</i>	R	3	R
marsh harrier	<i>Circus aeruginosus</i>	R		S
hen harrier	<i>Circus cyaneus</i>	R	3	V
Montagu's harrier	<i>Circus pygargus</i>	R	4	S
goshawk	<i>Accipiter gentilis</i>	O		S
sparrowhawk	<i>Accipiter nisus</i>	R		S
common buzzard	<i>Buteo buteo</i>	R		S
Spanish imperial eagle	<i>Aquila adalberti</i>	O	1	E
booted eagle	<i>Hieraaetus pennatus</i>	R	3	R
Bonelli's eagle	<i>Hieraaetus fasciatus</i>	R	3	E
osprey	<i>Pandion haliaetus</i>	R	3	R
lesser kestrel	<i>Falco naumanni</i>	R	1	V
common kestrel	<i>Falco tinnunculus</i>	R	3	D
merlin	<i>Falco columbarius</i>	O		S
hobby	<i>Falco subbuteo</i>	R		S
Eleonora's falcon	<i>Falco eleonora</i>	R	2	R
lanner	<i>Falco biarmicus</i>	O	3	E
peregrine	<i>Falco peregrinus</i>	R	3	R
European crane	<i>Grus grus</i>	O	3	V

In addition to passage migrants, many migrants arrive from northern Europe every year to spend their winter in Gibraltar, augmenting the passerine density on the Upper Rock considerably. Species that winter on the Rock are listed in table 3.



common kestrel

Juan Tébar/GONHS

Table 3. Birds that occur on the Upper Rock Nature Reserve during the winter, together with their frequency of occurrence and conservation status and the category attributed to them by BirdLife International with which they can be seen and conservation status criteria attributed to them by BirdLife International (which follow those of table 1).

Common Name	Scientific Name	Frequency of Occurrence	SPEC Category	European Threat Status
short-toed eagle	<i>Circaetus gallicus</i>	O	3	R
common buzzard	<i>Buteo buteo</i>	O		S
booted eagle	<i>Hieraaetus pennatus</i>	R	3	R
Eurasian woodcock	<i>Scolopax rusticola</i>	O	3w	Vw
tawny owl	<i>Strix aluco</i>	O	4	S
crag martin	<i>Ptyonoprogne rupestris</i>	R		S
grey wagtail	<i>Motacilla cinerea</i>	R		S
white wagtail	<i>Motacilla alba</i>	R		S
Duncock	<i>Prunella modularis</i>	R	4	S
alpine accentor	<i>Prunella collaris</i>	R		S
European robin	<i>Erithacus rubecula</i>	R	4	S
black redstart	<i>Phoenicurus ochruros</i>	R		S
Stonechat	<i>Saxicola torquata</i>	R	3	D
song thrush	<i>Turdus philomelos</i>	R		S
Redwing	<i>Turdus iliacus</i>	O		S
Blackcap	<i>Sylvia atricapilla</i>	R	4	S
common chiffchaff	<i>Phylloscopus collybita</i>	R		S
Firecrest	<i>Regulus ignicapillus</i>	R	4	S
coal tit	<i>Parus ater</i>	O		S
common starling	<i>Sturnus vulgaris</i>	R		S
common chaffinch	<i>Fringilla coelebs</i>	O	4	S
European serin	<i>Serinus serinus</i>	R	4	S
European greenfinch	<i>Carduelis chloris</i>	R	4	S
European goldfinch	<i>Carduelis carduelis</i>	R		S
Siskin	<i>Carduelis spinus</i>	O		S



Although most of the birds that winter within the Nature Reserve have a secure conservation status, some habitat management measures could ensure that parts of the Upper Rock provide an optimal habitat for these species. Opening up some of the vegetation and regular clearing of the firebreaks (as discussed in Chapters 10 & 11) would benefit most of these species, including the stonechat *Saxicola torquata* which is declining in Europe, and which can no longer be seen on the Upper Rock as often as it used to due to the increasingly dense vegetation.

European bee-eater

12.5 Breeding Birds

Table 4. Breeding birds of the Upper Rock Nature Reserve, together with frequency with which they breed at the site and conservation status and criteria attributed to them by BirdLife International (which follows that of table 1).

Common Name	Scientific Name	Frequency of Occurrence	SPEC Category	European Threat Status
lesser kestrel	<i>Falco naumanni</i>	R	1	V
common kestrel	<i>Falco tinnunculus</i>	R	3	D
Peregrine	<i>Falco peregrinus</i>	R	3	R
Barbary partridge	<i>Alectoris barbara</i>	R	3	E
yellow-legged gull	<i>Larus cachinnans</i>	R		S
barn owl	<i>Tyto alba</i>	O	3	D
European scops owl	<i>Otus scops</i>	O	2	D
little owl	<i>Athene noctua</i>	R	3	D
Pallid swift	<i>Apus pallidus</i>	R		S
alpine swift	<i>Apus melba</i>	R		S
crag martin	<i>Ptyonoprogne rupestris</i>	O		S
winter wren	<i>Troglodytes troglodytes</i>	R		S
European robin	<i>Erithacus rubecula</i>	R	4	S
Nightingale	<i>Luscinia megarhynchos</i>	O	4	S
blue rock thrush	<i>Monticola solitarius</i>	R	3	V
Blackbird	<i>Turdus merula</i>	R	4	S
Sardinian warbler	<i>Sylvia melanocephala</i>	R	4	S
Blackcap	<i>Sylvia atricapilla</i>	R	4	S
western Bonelli's warbler	<i>Phylloscopus bonelli</i>	O	4	S
blue tit	<i>Parus caeruleus</i>	R	4	S
Great tit	<i>Parus major</i>	R		S
common raven	<i>Corvus corax</i>	O		S
spotless starling	<i>Sturnus unicolor</i>	R	4	S
house sparrow	<i>Passer domesticus</i>	R		S
common chaffinch	<i>Fringilla coelebs</i>	O	4	S
European serin	<i>Serinus serinus</i>	R	4	S
European greenfinch	<i>Carduelis chloris</i>	R	4	S
European goldfinch	<i>Carduelis carduelis</i>	O		S
rock bunting	<i>Emberiza cia</i>	O	3	V

As can be seen from the table 3, twenty species of birds breed regularly (i.e., every year) within the Upper Rock Nature Reserve. This number is augmented by some 9 species that, although not breeding every year, breed occasionally. Of these 29 species, 9 have an unfavourable conservation status, with the lesser kestrel *Falco naumanni*, being a species of global conservation concern, and the Barbary partridge *Alectoris barbara*, being endangered within Europe (as well as being a Schedule 3 species).

One of the species that breeds regularly within the Nature Reserve, the peregrine *Falco peregrinus* is given a European Threat Status of 'Rare' by BirdLife International, as well as hav-

ing a globally unfavourable conservation status. It is significant to point out that this species occurs in Gibraltar at a far higher density than in most parts of the world, due to the amount of food that occurs in the Strait area in the form of migrant birds. Within our two and a half square miles, 4-6 pairs of this species nest, with 4-5 of these nesting on the cliffs of the Upper Rock Nature Reserve. In the spring of 2002, six pairs nested on the Rock, five of these within the Nature Reserve (V. Robba & S. Olivero, *pers. comm.*).

Three of these 29 species are attributed a European Threat Status of 'Vulnerable'. These are the lesser kestrel *Falco naumanni*, the blue rock thrush *Monticola solitarius*, and the rock bunting *Emberiza cia*. Of these three species, the first two breed within the Nature Reserve every year. The blue rock thrush is found breeding on the cliffs in some numbers, and the population size has remained fairly stable over the years. This is not the case with the lesser kestrel however. This species breeds on the Cliff at North Front, directly below Princess Caroline's battery, where a colony of this bird finds itself in steady decline. Irby (1895) recorded vast numbers breeding here in 1895, and these had dropped to about 15 pairs by 1980 (Cortes et al. 1980). The count in 2002 recorded seven pairs (P. Rocca, *pers. comm.*) whilst five pairs were recorded in 2003 (V. Robba, *pers. comm.*), but the number of pairs has gone down to four in some years. The cause of decline seems to be a combination of habitat loss (given that its hunting grounds in the Spanish hinterland have been reduced due to increased urbanisation in the La Linea area) and competition for nesting sites with the larger and more robust feral pigeon, an introduced species. This is significant in that habitat loss and loss of nest sites is a problem that this species faces throughout the whole of its range (Heredia et al. 1996). The second factor seems to be a problem at many lesser kestrel breeding colonies in the vicinity, such as that at the castle at Vieja Castellar, where an increasing number of nest holes are being taken by pigeons, resulting in a decrease in lesser kestrel numbers (*pers. obs.*).

The Barbary partridge *Alectoris barbara*, is seen by many as Gibraltar's 'National bird', the reason for which it is depicted in various local artefacts, most notably on Government of Gibraltar one-penny coins and twenty pound notes. Gibraltar is the only place in mainland Europe where this species is to be found, and the only place in Europe where the hunting of this species is banned (this bird is also found in Sardinia and the Canary Islands, where it is hunted extensively (Tucker et al. 1994)). Our partridge is given a European Threat Status of 'Endangered', and has an unfavourable global conservation status. Although the population of partridges on the Rock is small when compared to those of Sardinia and the Canaries, it is a population of European importance, not only because it is located on the mainland, but also because it is unique in that it is free of human persecution.

There are however some problems which face the local population of the Barbary partridge, a large proportion of which is found within the Upper Rock Nature Reserve. The first of these is that there has been a notable reduction in suitable habitat for this species due to the pronounced neglect that some of the firebreaks have suffered from. Secondly, and equally serious problem is that there has been a marked increase in the feral population of the domestic cat *Felis catus*, with up to sixteen counted at one time at St Michael's cave, for example. Cats have a strong predatory instinct, and partridges, and in particular their chicks are easy prey for these animals. A female Barbary partridge lost seven chicks within the space of 24 hours, having its brood reduced from nine to two (J.P. Acolina, *pers. comm.*). Although the cause of death of these chicks is unknown, it is likely that domestic cats were responsible for at least some of them. An added problem is the rise in illegal chicken coops on the Upper Rock with one at St. Michael's cave, another beside the Cable Car Top Station and chickens around Bruce's Farm and Princess Caroline's Battery. These wildfowl can transmit diseases to the Barbary partridge and may compete for food. Predation by yellow-legged gulls *Larus michahellis*, is also a possibility and they may take some chicks from time to time (GONHS 1994).

The last confirmed nesting record of common raven *Corvus corax* in Gibraltar was back in 1972. However, a pair of ravens recolonised the Rock in 2000 and nesting was attempted at Anglian Way in 2001 and the cliffs above Catalan Bay in 2002 and 2003, although the raising of fledglings was unlikely on both occasions. Apart from further enhancing Gibraltar's biodiversity, there is one very clear benefit to the presence of ravens on the Rock; they are undoubtedly a nuisance to the gulls. These birds will readily feed on unattended eggs and chicks, and they have in fact been observed feeding on feral pigeon chicks and eggs as well (V. Robba, *pers. comm.*). The role of the raven in controlling both gull and, perhaps more effectively, feral pigeon reproductive success could in fact be an important one, since they have been seen to raid feral pigeons nests on the cliffs above Catalan Bay, (V. Robba, *pers. comm.*).

A number of bird species were lost as residents of the Upper Rock at the beginning of the Twentieth Century, either due to habitat loss or disturbance in WWII, during the quarrying of rock for the creation of the runway. Species that were lost include Bonelli's eagle *Hieraetus fasciatus*, Egyptian vulture *Neophron percnopterus*, western jackdaw *Corvus monedula*, Dartford war-

bler *Sylvia undata*, and black wheatear *Oenanthe leucura*. Of these, two species disappeared due to habitat loss; the Dartford warbler due to the changing nature of the vegetation on the Upper Rock and the black wheatear due to both this and the development of the water-catchments on the sand slopes of the east side of the Rock. The other species, all of which bred on cliffs, were lost during the disturbance that the development of the runway caused.

It is significant to note that on the 19th June 2003, a female, hand-reared Bonelli's eagle was released in Gibraltar, after having been expertly trained by Vincent Robba and Stanley Olivero of the GONHS Raptor Rehabilitation Unit. The bird had been fed on yellow-legged gull carcasses and had been trained to hunt and attack gulls. For at least eight weeks the bird remained in Gibraltar, relying on the large yellow-legged gull population for food. However, as gulls began to undertake their post-breeding dispersal, the eagle moved away from the Rock. It was hoped that this bird would return to Gibraltar once the gulls did so, but it has not been seen since and the possibility that it found a mate in the territory in nearby Spain seems feasible. It was successful in disrupting the gull colony during its short stay and it might be an idea to acquire a pair of captive-bred Bonelli's eagles in order to try to establish a breeding pair. This would probably go a long way towards controlling the gull population, as these birds would predate on both adult and young gulls, and provide a source of constant disturbance to the gulls.

12.6 Recommendations

1) It is strongly advised that all Directives and conventions that Gibraltar is committed to, be fully implemented as soon as possible. Apart from avoiding infraction proceedings against the UK, these would be of unquestionable benefit to Gibraltar's wildlife. It would also ensure that Gibraltar is seen within these Directives and conventions as a responsible, respectable partner who is equally committed to conservation issues as other partners in these international efforts. The 'Natura 2000' Network in particular is important in that it covers many of the aspects of other conventions and Directives, as well as the Habitats Directive. A diverse cross-section of habitats in Gibraltar should therefore be protected on this basis. In addition, action plans should also be considered for species with unfavourable status (both locally and internationally), in order to ensure that important elements of our biodiversity are conserved.

2) There should be a co-ordinated programme for the control of the feral pigeon within and around the Upper Rock Nature Reserve. This would allow the globally threatened lesser kestrel to make maximum use of breeding sites available at the North Face of the Rock.

3) Heredia *et al.* (1996) recommend that all lesser kestrel colonies should be designated as protected areas. The cliffs of the North Face of the Rock and most of the cliffs along the Nature Reserve boundary are not included within the Upper Rock Nature Reserve. These cliffs should certainly be included within the Nature Reserve especially the North Face, given that it hosts an extremely vulnerable colony of lesser kestrels, as well as a range of Gibraltar's rare plants. In addition, other cliff sites that hold breeding lesser kestrels, peregrines, or other birds with an unfavourable status should be protected.

4) Heredia *et al.* (1996) also recommend that colonies of lesser kestrels should be protected from accidental and deliberate disturbance. This applies to work carried out at Princess Caroline's Battery, which, when close to the colony, should take place outside the lesser kestrel's breeding season. This should also apply to any occurrences in Devil's Tower Road and its vicinity. It is also noted that a scrap-yard is located directly below the colony, and an effort should be made to create awareness of these birds amongst those who run and work at the scrap-yard, and to keep disturbance to a minimum. Rock climbing on any of the cliffs of Gibraltar should also be restricted during the breeding season. It is interesting to note that under the 'Nature Protection Ordinance, 1991' (L/N 11 of 1991) it is illegal to 'deliberately disturb any wild bird'. In keeping with amendments of the UK Wildlife and Countryside Act (2000), this should be amended to include the word recklessly as well as deliberately, as for example, an excess of disturbance in the vicinity of a lesser kestrel colony, whilst not deliberate, could result in the loss of this bird as a breeding species on the Rock. It is worth noting that lesser kestrels frequently breed within town centres, in old buildings such as churches, and are therefore tolerant of some disturbance. People within the vicinity of a lesser kestrel colony can therefore go about their business normally, providing an excess of disturbance is not produced.

5) An effort should be made to increase the number of lesser kestrels breeding at the North Front colony or within the Nature Reserve through a reintroduction programme.

6) As has been said, one of the factors that has led to the sharp decline in lesser kestrels has been habitat loss. These birds once fed on the isthmus, and the habitat in this area has all but disappeared. It is interesting to note that one of the last vestiges of isthmus habitat is the MOD Aerial Farm on Devil's Tower Road. Aerials at this site are being dismantled, and the site will eventually be, in MOD parlance, 'alienated', i.e., released to the Government of Gibraltar. Given

¹ Pp.919,2A.(d).

the site's potential importance to the maintenance of our lesser kestrel colony, it would be wise to include this area within the 'Natura 2000' network, under the EC Birds Directive (of which the lesser kestrel is an 'Annex 1' species) and EC Habitats Directive, a system that is designed to conserve globally threatened species such as the lesser kestrel, and to which Gibraltar, under the UK, is committed. Not only this, but the site can be actively enhanced and restored back to its original state, with invertebrate, reptile and amphibian reintroductions (the spiny-footed lizard *Acanthodactylus erythrurus*, and western spadefoot toad *Pelobates cultripes*, were once found in this area), This would undoubtedly improve the site immensely for the lesser kestrels. Being an 'Annex 1' species, the Government of Gibraltar is required to participate actively in lesser kestrel conservation efforts.

7) An action plan should be drawn up for the conservation of lesser kestrels on the Rock, taking all of the above points into consideration. This is currently being prepared.

8) Regular clearing of the firebreaks should be carried out outside of the Barbary partridge's breeding season. This would ensure that partridges are not disturbed whilst they are breeding. It would also ensure that enough habitat is available to maintain a healthy population of Barbary partridges.

9) Stray cats provide a serious threat to much of the Upper Rock's fauna, not just birds. A serious attempt should be made to eradicate this pest species from within the Nature Reserve.

10) Deliberate release of this and any other animal and the feeding of the same should be made illegal, and the law enforced.

11) The establishment of chicken coops within the Upper Rock should be prohibited and the introduction and/or rearing of any wild animal or plant even in residential areas should be allowed only through the express permission of the Board of Management after consultation with the Scientific Authority.

12) The regeneration of the east side sand slopes means that a reintroduction programme for the black wheatear could prove successful, and is recommended, as the highly sedentary nature of this species makes natural recolonisation unlikely. This should extend to the cliffs of the Upper Rock and other suitable areas within the Nature Reserve, such as the area immediately below Rock Gun.

13) A possible reintroduction of the western jackdaw could be looked into, as these could possibly control the gull population in some areas with some success, given that gull eggs would provide a major food-source. However, these birds formally bred at the site where the lesser kestrels are to be found, and so any plans for reintroduction should be treated with caution, as this species could compete with the lesser kestrels for nest sites, and the lesser kestrels could also suffer from egg-theft as a result of the introduction. Should a reintroduction take place therefore (albeit after careful consideration), it is recommended that this be carried out at a different site to their former nesting site. A possibility for this could be the Moorish Castle, where, as well as being away from the lesser kestrels, the jackdaws would have easy access to the nests of those gulls that breed in the town area.

14) As well as tackling those species that are endangered at a European or global level, it is important to point out that BirdLife International recommends that 'absence of species from the SPEC list or its allocation to a low European Threat Status does not automatically justify its exclusion from national conservation action' (Tucker, *et al.*, 1994). It is therefore justifiably recommended that measures be maintained to protect the whole of the Upper Rock's breeding avifauna.

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13. Mammals

13. Mammals

Mammals are not well represented within the Upper Rock Nature Reserve. The list of species that are found within the Nature Reserve is therefore small, and is given in table 1, together with IUCN classifications. This is followed by a brief account of the status of each species within the Nature Reserve.

Table 1. Mammals currently occurring within the Upper Rock Nature Reserve, together with their IUCN classifications, which are as follows: DD = data deficient, LC = lower concern, VU = vulnerable. Classifications taken from Rowe (1996) and Palomo & Gisbert (2002).

Common Name	Scientific Name	IUCN Classification
Greater white-toothed shrew	<i>Crocidura russula russula</i>	LC
Greater mouse-eared bat	<i>Myotis myotis myotis</i>	
Mediterranean pipistrelle	<i>Pipistrellus mediterraneus</i>	
Schreiber's bat	<i>Miniopterus schreibersii</i>	
European free-tailed bat	<i>Tadarida teniotis teniotis</i>	
Barbary macaque	<i>Macaca sylvanus</i>	VU
black rat	<i>Rattus rattus alexandrinus</i>	DD
house mouse	<i>Mus domesticus</i>	LC
Rabbit	<i>Oryctolagus cuniculus</i>	LC

As can be seen in table 1, none of the European bats are given a category by the IUCN. However, both the Schreiber's bat *Miniopterus schreibersii*, and the large mouse-eared bat *Myotis myotis*, are protected by European law, under 'The Convention on the Conservation of Migratory Species of Wild Animals' also known as the Bonn Convention, and more specifically in the 'The Agreement on the Conservation of Bats in Europe (1994)' (see Chapter 4, European Directives).

The status of each species within the Upper Rock Nature Reserve is given below.

- Greater white-toothed shrew *Crocidura russula russula* – small numbers can be found within the Nature Reserve, where it seems to be relatively common. Feral domestic cats *Felis catus*, are a threat to this species, as are discarded empty bottles and cans which these animals frequently enter in search of prey, only to find themselves trapped subsequently.

- Greater mouse-eared bat *Myotis myotis myotis* – large numbers formally occurred in the caves of the Upper Rock, where roosts of up to about 1000 were recorded in the 1960s (Palao *Unpubl.*) (a breakdown of the number recorded within each cave can be seen in table 2). The status of this species within the Nature Reserve (and in Gibraltar) is now uncertain, but numbers have certainly declined dramatically, and this bat has not been recorded for a number of years (although this may also be due to a lack of observers). Disturbance at roosting sites such as Martin's Cave is undoubtedly one of the reasons why this species has declined, as may be the loss of feeding habitat, although population patterns observed at Gibraltar may also mirror regional trends.

- Mediterranean pipistrelle *Pipistrellus mediterraneus* – this species is fairly common within the Nature Reserve, and throughout Gibraltar as a whole.

- Schreiber's bat *Miniopterus schreibersii* – caves in Gibraltar formally held large populations of this endangered species; about 6800 were recorded in caves within the Upper Rock in the 1960s (Palao *Unpubl.*) (a breakdown of the number recorded within each cave can be seen in table 2). However, like the greater mouse-eared bat, numbers have dropped substantially, and the largest number recorded recently has been 210 in 2002. These included two individuals that had been ringed at a roost about 200km northeast in Málaga province, Spain. Reasons for this sharp decline in numbers are likely to be similar to those for the greater mouse-eared bat, with disturbance to roosting sites and possibly loss of feeding habitat, being important factors, although another reason is disease, which has been noted in this species in Iberia in 2003 (A. Hutton. *pers. comm.*).

- European free-tailed bat *Tadarida teniotis teniotis* – this large bat is common within the Nature Reserve, and can frequently be heard at night. It roosts on cliffs, ledges and buildings in the Town, and is present throughout the year. Since it does not rely on caves and tunnels as roosting sites, it does not seem to suffer the same threats as the greater mouse-eared and Schreiber's bats.

- Barbary macaque *Macaca sylvanus* – the Barbary macaques found within the Upper Rock Nature Reserve are the only free-ranging non-human primates in the whole of Europe, and a population of 209 can currently be found within the Nature Reserve. Chapter 11 deals with the macaques at length.

- House mouse *Mus domesticus* – small populations of this species are located around human habitation, and some can be found at the Ape's Den.

- Black rat *Rattus rattus alexandrinus* – the black rat, originally introduced, is abundant within the Nature Reserve. Although these will feed on practically anything, within the Nature Reserve they seem to be mainly frugivorous in nature, with a particular taste for pine seeds (pine cones that have been attacked by rats are a common sight on the Upper Rock). The black rat is preyed upon by some of the predators of the Nature Reserve, particularly the larger snakes such as the horseshoe whip-snake *Coluber hippocrepis*, Montpellier snake *Malpolon monspessulanus*, and ladder snake *Elaphe scalaris*. It was also no doubt an important source of prey for the red fox before this species disappeared from Gibraltar.

- Rabbit *Oryctolagus cuniculus algirus* – a small population of rabbits can be found on the Upper Rock. Although found mainly in clearings, rabbits can also be seen within the scrub. Numbers fluctuate according to the prevalence of the *Myxomatosis virus*, but are never high. Another problem is that of pet rabbits which are often released on the Upper Rock. These have the potential to interbreed with the indigenous population, and can have a negative effect on the local genetic stock. Since numbers have in the past been hit hard by *Myxomatosis*, and given that the population on the Upper Rock is completely isolated, a reintroduction and captive breeding programme would help to maintain a healthy population.

Table 2. Breakdown of bat totals at different caves within the Upper Rock during the 1960s (taken from Palao *Unpubl.*).

Site	Species	Number
Goat's hair Twin Caves	<i>Miniopterus schreibersii</i>	300
Martins Cave	<i>Miniopterus schreibersii</i>	5000
	<i>Myotis myotis</i>	1000
Spider Cave	<i>Miniopterus schreibersii</i>	100
Old Hut, top of Med. Steps	<i>Miniopterus schreibersii</i>	50
Tunnel below O'Hara's Battery	<i>Miniopterus schreibersii</i>	200
Lower series, St Michael's Cave	<i>Miniopterus schreibersii</i>	500
Leonora's Cave	<i>Miniopterus schreibersii</i>	300
Breakneck Battery	<i>Myotis myotis</i>	30
Haynes Cave	<i>Pipistrellus spp.</i>	100
Ancient Moorish lookout	<i>Miniopterus schreibersii</i>	5
Ancient Visigothic guardhouse	<i>Miniopterus schreibersii</i>	200
Devil's Gap Battery, south magazine	<i>Miniopterus schreibersii</i>	20
Poca Roca cave	<i>Miniopterus schreibersii</i>	100
Willis's Magazine	Unknown sp.	200

In addition to these, several species occurred until relatively recently (*i.e.*, the last few hundred years). These are listed in table 3 together with their IUCN classifications, and an account of each species follows.

Table 3. Mammals that have become extinct within recent history, together with their IUCN categories.

Common Name	Scientific Name	IUCN Classification
Algerian hedgehog	<i>Atelerix algirus algirus</i>	DD
red fox	<i>Vulpes vulpes silacea</i>	LC
small-spotted genet	<i>Genetta genetta</i>	LC
wild boar	<i>Sus scrofa boeticus</i>	LC
Spanish ibex	<i>Capra pyrenaica</i>	VU

Of these five species, the red fox, small-spotted genet and probably the Algerian hedgehog survived on the Rock into the twentieth century. The other two species disappeared long before this.

- Algerian hedgehog *Atelerix algirus algirus* – it is not certain whether this species ever actually formed a part of our fauna (at least in recent times). However, hedgehogs of this species were at one time seen or recovered from the Upper Rock with some frequency, although this is no longer the case. This species was in fact introduced to the Iberian Peninsula by man (Palomo & Gisbert 2002), and so is not native to the region, the native species being the western hedgehog *Erinaceus europeus*. However, this species does better in drier maquis and garrigue habitats than does its European counterpart, and is therefore more suited to the Rock's conditions.

- Red fox *Vulpes vulpes silacea* – the red fox was once found on the Upper Rock but became extinct in the 1980s. There are some who believe that foxes were originally introduced to Gibraltar by the British for the purposes of hunting. Jackson (1987) states of the early 1800s that 'it was at this time that the Reverend M.A. Mackereth, chaplain to the Duke of Kent, and a local lawyer, Mr. Ralph, imported the first two English foxhounds to hunt foxes on the Upper Rock'. This suggests that foxes already occurred on the Upper Rock naturally, and so the British decided to hunt them. However, the possibility of importations of foxes to bolster the local population cannot be ruled out.

- Small-spotted genet *Genetta genetta* – this animal, which was probably introduced to Iberia by the Moors, was certainly present in Gibraltar in recent history, possibly as late as the early 1900s, when genets were reportedly a nuisance to those who kept chickens (Miles 1920).

- Wild boar *Sus scrofa baeticus* – wild boars disappeared from the Upper Rock in the late 1700s.

- Spanish ibex *Capra pyrenaica* – records of ibex in Gibraltar are prehistoric, and it is not known exactly when these animals disappeared from the Rock. Records of wildlife in Gibraltar before the 1700s are not good, and it may be that these animals were still present a few hundred years ago.

13.1 Mammal Reintroductions

Some scope exists for the reintroduction of certain species of mammals into the Upper Rock Nature Reserve. As mentioned previously, it would be a good idea to release rabbits on the Upper Rock in order to replenish the local population. Wild rabbits are bred in nearby Spain and can be easily obtained by GONHS.

A red fox breeding programme was attempted by GONHS based on the rationale that a fox population within the Nature Reserve would go a long way towards controlling the gull population of the Rock, and restricting these birds to cliffs (foxes would feed on adult gulls, young birds and even their eggs). This began in 1995, using animals from nearby Spain that had previously been kept in captivity. Unfortunately, due possibly to the fact that the male fox was profoundly imprinted these animals did not breed, and have not bred to this day. Although this was indeed a considerable setback, the option of a red fox reintroduction still remains open for the Upper Rock Nature Reserve. This would be beneficial, not only to the Nature Reserve, but to the whole of Gibraltar in the sense that a red fox reintroduction would go some way towards reducing the gull population of the Upper Rock effectively. GONHS have access to foxes from nearby Spain (which are frequently trapped and even culled in some areas) and so would have no problem in obtaining animals for the purposes of reintroduction. Furthermore, rather than embark on another attempt to breed foxes in captivity, it would be preferable to bring wild animals in from Spain, screen these for diseases, vaccinate them against any disease that might pose a danger to the public and then release them immediately.

Vegetation succession presents a serious problem to open areas in the Upper Rock, particularly given that areas such as firebreaks are not cleared as often as they used to be (some are not cleared at all). One solution to this problem would be to introduce large herbivores into these open areas. If this is carried out following the clearing of the area, then these animals will keep the vegetation permanently low. Perhaps this could be done using livestock such as cattle, sheep or goats. However, these animals would lend very little to the aesthetic appeal of the Nature Reserve. In this sense, it would seem far better to introduce wild ungulates such as Spanish ibex *Capra pyrenaica*, or Barbary sheep *Ammotragus lervia*. Both of these species are considered vulnerable by the IUCN (Palomo & Gisbert 2002), and so maintaining a population of any of these two species on the Rock would also assist in the conservation of these animals. The Spanish ibex would perhaps be the favoured option, given that this animal once occurred on the Rock and is still found in the mountains to the north of Gibraltar. However, there is no reason why both species cannot be introduced. These animals would help to both clear the vegetation and provide a natural attraction with-

in the Nature Reserve. Both Spanish ibex and Barbary sheep are readily available to GONHS. However, the two herds of domestic goat that are currently found on the Upper Rock (one at Royal Anglian Way and the other at Rock Gun) should be eliminated before this occurs to ensure that these do not interbreed with the introduced animals, as they are certainly capable of doing with the ibex.

The possibility of introducing roe deer *Capreolus capreolus*, to Gibraltar has been considered in some detail. Discussions with Spanish roe deer expert Dr Cristina San Jose Huguenot, which included a visit to the Upper Rock, have reached the conclusion that the habitat is suitable for the species. Many of the components of the Gibraltar maquis are known food plants for these small deer. Dr San Jose however recommended that in order to maintain a population of these animals, a number of watering points would be needed on the Upper Rock, with running water. She supported the initiative as this would set up a new population of the relatively uncommon Andalusian form of the Roe Deer.

Initial consideration is being given to the area above Bruce's Farm and the proposed Middle Hill/Rock Gun Biological Reserve as the most suitable in which to locate a source of water for these animals, and the possibility of setting up a number of watering points with running water is being studied. A number, probably four, young Roe Deer, which would be made available by the Cádiz Conserjería Provincial de Medio Ambiente would then be released on the site, fitted with radio collars, and their movements monitored by GONHS.

Since the roe deer is a largely solitary browser that lives in low densities (compare a few smaller, solitary animals to a whole herd of the larger and more voracious ibex or sheep), then this herbivore would probably have a limited effect on vegetation control, but the main purpose of the introduction would be to enhance the diversity and interest of the fauna of the Upper Rock. There is no doubt that the chance of seeing a roe deer on an early morning or late evening walk would enhance the appeal of the Upper Rock Nature Reserve considerably to both tourist and local nature enthusiasts. However, given that the species is hard to see in its native habitats due to its secretive habits, the roe deer would not be an animal that most visitors to the Upper Rock would be able to observe. Furthermore, introducing roe deer would incur the cost of constructing and maintaining several watering points. The advantages and disadvantages of introducing this animal must be seriously weighed out before a firm decision is made on the possibility of its introduction to the Upper Rock Nature Reserve.

13.2 Recommendations

1) A more effective system of litter control and clearance (taking in the whole of the Nature Reserve and not only the roadsides) is needed on the Upper Rock, as cannot be stressed enough. Discarded cans and bottle pose a serious threat to shrews, and is just one of the many reasons why the litter problem on the Upper Rock should be addressed effectively.

2) Although grilles and fences have been erected close to the entrances of some of the caves and tunnels that bats use as roosts, the actual management of the Nature Reserve should take a more active part in the conservation of bats, and in particular bat roosts on the Upper Rock. This should include erection of and repairs to fences and grilles when these are needed, as well as monitoring of bat populations. Monitoring should always be carried out in a responsible manner, and should not take place without the advice and supervision of experts (such as GONHS members).

3) Some thought should be given to the introduction of wild rabbits in the Nature Reserve in order to replenish the depleting local population. These can be obtained by GONHS from nearby Spain, where wild rabbits are bred in large numbers. This would, for example, make the local population less vulnerable to extinction due to factors such as severe outbreaks of the *Myxomatosis virus*, which sometimes affects the local population dramatically (although it is now a number of years since large numbers of rabbits suffering from this disease were last observed). Steps should also be taken to remove released domestic rabbit and to prevent future releases of this type.

4) The reintroduction of red foxes to the Upper Rock Nature Reserve should be attempted once again. Young animals can be procured from Spain, screened for diseases and vaccinated against any possible disease such as rabies, canine distemper, etc. Those animals that are clear of disease should be released after a small period of familiarisation, within the current fox pen. This release could be carried out at a time during which gulls are common on the Upper Rock, such as the gulls' breeding season. An abundance of food would certainly make the animals adapt to the Upper Rock more quickly (although foxes are highly adaptable creatures, and food sources such as rats, berries etc. are always available).

5) Large grazers such as Spanish ibex or Barbary sheep should be introduced to areas

of the Nature Reserve where vegetation is low, such as the firebreaks and the Rock gun water catchment. If this is preceded by a clearance of the vegetation, then these ungulates will help to maintain the vegetation permanently low. Since the ibex was formally found on the Rock and is still native to southern Spain, then this would possibly be the preferred option. However, it must also be considered that the Barbary sheep is an animal that is seriously threatened with extinction within its native range. The maintenance of a herd on the Upper Rock would then justifiably serve as a case of *ex situ* conservation. The possibility of introducing a herd of each species, perhaps with ibex introduced to the disused water catchment at Rock Gun and sheep introduced to the lower firebreaks, could also be considered. Access to these animals would present little problem. Barbary sheep can be readily obtained from Jerez zoo, whilst, as in the case of the roe deer, the Cádiz Consejería Provincial de Medio Ambiente would make ibex available to us.

6) The introduction of the roe deer is a more complex issue, and one that requires serious consideration before making any decision. This animal would undoubtedly enhance the appeal of the Upper Rock Nature Reserve, and the chance of catching an elusive view of one of these animals during the early morning or late evening is something that would excite any person with a love or appreciation of nature. However, it must also be considered that roe deer need a constant supply of water, and any attempted introduction must take into account that a water supply must be properly maintained, and that this will undoubtedly incur some sort of cost.

7) The population of feral cats *Felis catus*, that currently exists on the Upper Rock should be eradicated, as these pose a serious threat to smaller mammals such as shrews and rabbits, as well as birds, reptiles and amphibians, and may compete with introduced red foxes.

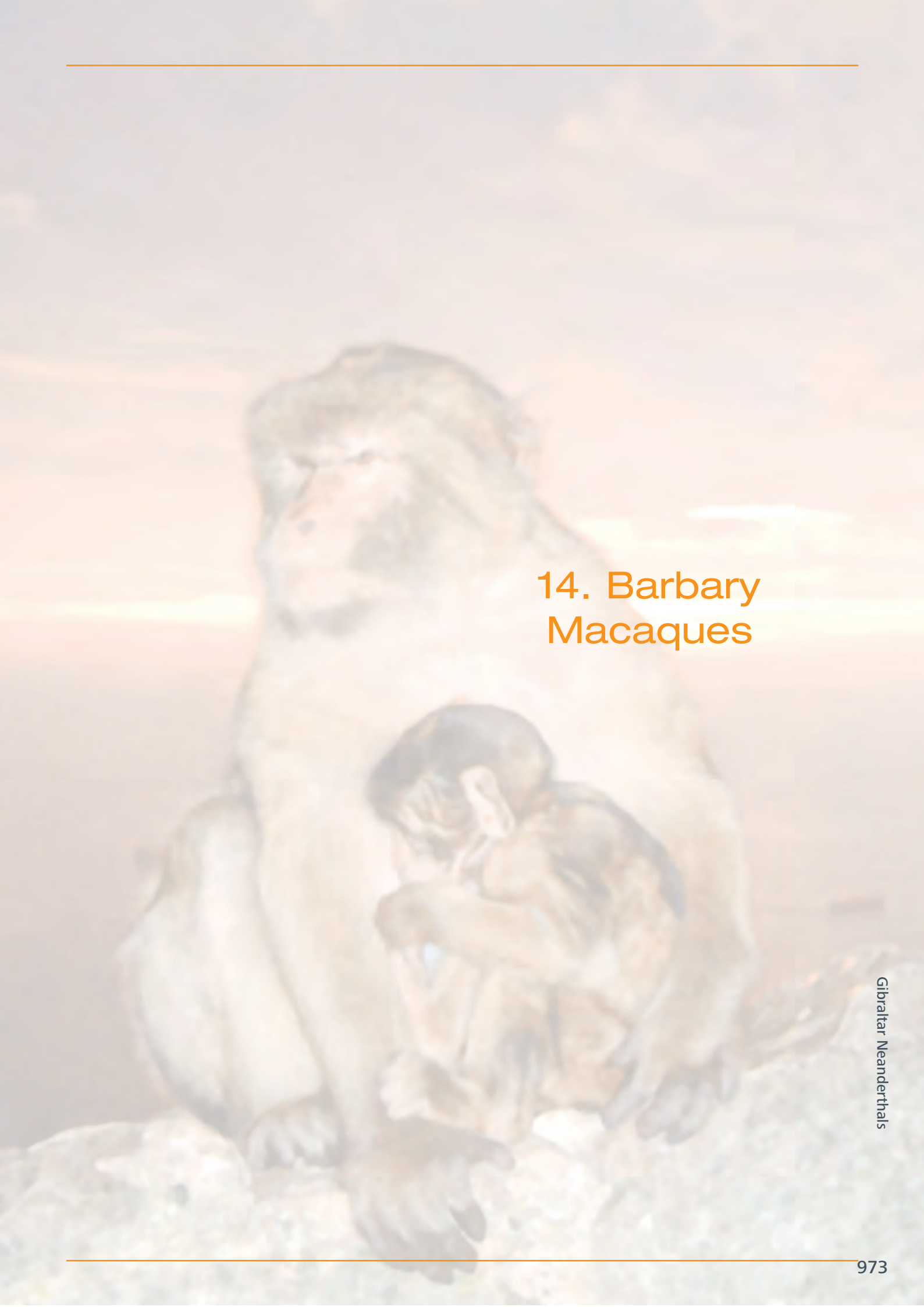


red fox

Eric Shaw / GONHS

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14. Barbary Macaques

14. Barbary Macaques

The Barbary macaque *Macaca sylvanus*, known locally as the Rock Ape, is the only free-ranging wild primate in Europe. Its European range is restricted to the Rock of Gibraltar, where they have possibly been present since the Moorish occupation of the Iberian Peninsula from 711ad. Records of their presence during the British occupation date back as far as 1740 (Burton 1972; Dawn Carroll 2001).

In 1915, the Armed Forces in Gibraltar took on responsibility for the Barbary macaques on the Rock, with the Gibraltar Volunteer Corps managing the population (MacRoberts & MacRoberts 1966; Dawn Carroll 2001). This consisted of regular feeding, allegedly in order to prevent the macaques from wandering down to town in search of food, and maintaining the population at a fixed number through culling. Initially, the population was maintained at twenty-five animals, and then at a minimum of thirty-four as from 1955 (Burton & Sawchuk 1974; Dawn Carroll 2001). Between 1939 and 1945 the population was restocked repeatedly with animals from North Africa (MacRoberts 1970, Burton & Sawchuk 1974; 1984, Dawn Carroll 2001, Cortes & Shaw 2003 *in press*). At one time during this period the population was critically low and was restocked at the request of the Prime Minister of the United Kingdom at the time, Sir Winston Churchill, on the basis of the legend that Gibraltar would only remain under British rule as long as there were Barbary macaques on the Rock of Gibraltar (Cortes & Finlayson 1988).

Originally, the macaques were restricted to one group at Queen's Gate, also known as the 'Apes Den'. At a later date a second group became established at Middle Hill. These two packs remained under the responsibility of The Gibraltar Regiment until 1990, when the Gibraltar Tourism Agency, owned by the Gibraltar Government, took over the responsibility of the Queen's Gate group at the 'Apes Den'. The management of this group was contracted out to 'MEDAMBIOS' from 1990 until 1992, after which the Gibraltar Tourism Agency took over the management of the site, together with responsibility over the entire population. In 1992 Sights Management Ltd. was contracted by the Gibraltar Tourism Agency to manage the Barbary macaques (Fa & Lind 1996; Isola & Isola 1993; Dawn Carroll 2001). This arrangement continued until 1997 when the Gibraltar Tourism Agency ended the contract and took over responsibility for the management for the next two years. In 1999, after lengthy discussions, the contract was awarded to the Gibraltar Ornithological & Natural History Society (GONHS). At present the responsibility for the feeding and management of the Barbary macaques still lies with this organisation.

14.1 Documentation & Research

In 1915 the Army took over responsibility for the Barbary macaques, but it was not until 1920 that a record of numbers was kept, although this was not consistent until the early 1940's (MacRoberts & MacRoberts 1966; Dawn Carroll 2001). All the observed births since World War II were recorded in the Regimental Records up to 1992, with the names of different personalities in Gibraltar bestowed on new macaques. Twice a year the Regiment would carry out a census of the Barbary macaques. Obviously identification of individuals was not always conclusive and inaccuracies in this and exact numbers were possible (Burton & Sawchuk 1974; Dawn Carroll 2001), but since only one person of the Regiment was charged with the task of looking after the macaque's interests, the possibility of error was greatly reduced. Only four persons, usually sergeants, were tasked with this appointment between 1935 and 1990. The last two were Sergeant Alfred Holmes and Private Kenneth Asquez.

In 1992 Sights Management took over the responsibility of the macaques on contract from the Gibraltar Tourism Agency. During this period, the Barbary macaque population increased from the two groups at Queen's Gate and Middle Hill, the former splitting into three to form a new group at Anglian Way and another at Prince Philip's Arch, and the latter forming the groups at Farringdon's Battery, Princess Caroline's Battery and Middle Hill. The feeding staff in charge of the macaques, now headed by Mr. Mark Zammitt, recorded newly born individuals. However, documentation for this period is sparse.

During the early 1980s Dr John Fa researched the Barbary macaque in Gibraltar for his doctoral thesis. His research and subsequent papers (e.g., Fa 1984; Fa and Lind 1986), on this subject made him a world authority on this particular animal. Based on his wide knowledge and experience on the subject he was awarded the contract for the management of the macaques, under the company name 'MEDAMBIOS', from 1990 to 1992. During this time he introduced a rudimentary interpretation centre at Queen's Gate with the introduction of wardens to control traffic and provide information to tourists at the site. He also improved the feeding of the animals and focused on the conservation of the species.

When the contract between both parties was rescinded in 1997, the Gibraltar Tourism Agency took over management for a period of two years, using the same feeding staff. In 1999 GONHS was awarded the contract for the management of the macaques. This organisation's background and knowledge, together with contacts with various institutions have provided a constant flow of students researching different aspects of the biology of the species, which will ensure that the future of the Barbary macaque in Gibraltar is secure.

Apart from Fa's work, research on the Barbary macaque population at Gibraltar has been ongoing since the 1960's. Before the 1960's only general descriptions and a brief population study was published (Anonymous 1834; Kenyon 1938; Hooton 1942). In the 1960's, MacRoberts and MacRoberts (1966) studied the Macaques' social behaviour and reproductive cycles (Dawn Carroll 2001). In addition, Burton and her colleagues conducted initial research in a variety of disciplines of the biology of the macaques between the 1970s and early 1980s (Burton 1972; Burton & Sawchuk 1974, 1984, 1982, 1984; Burton & de Pelham 1979; Burton & Underwood 1987; Zeller 1980, 1986; Dawn Carroll 2001).

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Links were established by GONHS with the Anthropological Institute of Zurich in the early 1990s. This led to the establishment of an ongoing research relationship between Professor Robert Martin of Zurich University and GONHS, based at the 'Bruce's Farm Research Centre', which has produced numerous studies of the biology of the Barbary macaque with particular emphasis on genetics. After numerous visits Professor Martin presented GONHS with a proposed management plan, known popularly as 'The Martin Plan' (Martin 1997) that helped GONHS secure the contract for the management of the macaques in 1999. As part of the research and monitoring of the macaques, GONHS, together with the Veterinary Clinic initiated a programme to tattoo and microchip all the macaques. This project, together with a population control scheme is continuing at present.

After Professor Martin's departure to the Chicago Field Museum, research contact was established with the German Primate Centre, under Professor Keith Hodges. Other institutions currently active in research in Gibraltar under the GONHS co-ordinated "Gibraltar Barbary Macaque Project" are Notre Dame University, Indiana, USA and the University of Vienna, Austria.

14.2 Feeding

One of the reasons that the Army was tasked with the management of the Barbary macaques in 1915 was that these animals would venture down to the town in search of food, and were becoming a nuisance, frequently raiding kitchens and taking fruit from gardens in close proximity to the Upper Rock. It was thought, erroneously as it turned out, that if they were fed up the Rock they would not venture into areas of human habitation. Initially, the Army was tasked with maintaining the population to within twenty-five animals and after 1955 to a minimum of thirty-four (Burton & Sawchuk 1974). Fa (1984) distinguishes four distinct periods of provisioning, distinguished by type and volume. From 1936 to 1946 only a proportion of the daily food requirement was provided, and some of this consisted of refuse from the cookhouse, resulting in widespread enteritis. The rest was obtained by the macaques through foraging. A similar volume of food was provided from 1946 to 1960, but in this case no cookhouse refuse was given. The absence of cooked and waste food during this period was responsible for the revival of the colony (Zeuner 1952; Fa 1984).

There was an increase in the size of the population between 1960 and 1967, resulting in the macaques being promoted as an important tourist attraction. This resulted in an increase in the volume of food provided. The provisioning of the second group took place at Princess Caroline's Battery, but this was later moved to Middle Hill. The quantity of food was increased a second time in 1970 with the aim of preventing animals wandering down to town. In 1980, culling of the population, which had been carried out by the Army without publicity, ceased (Fa & Lind 1996). This resulted in an increase in the population from 33 in two groups in 1970, to 105 in 1993 and 190 in 2001 (see Fig 1 & 2).

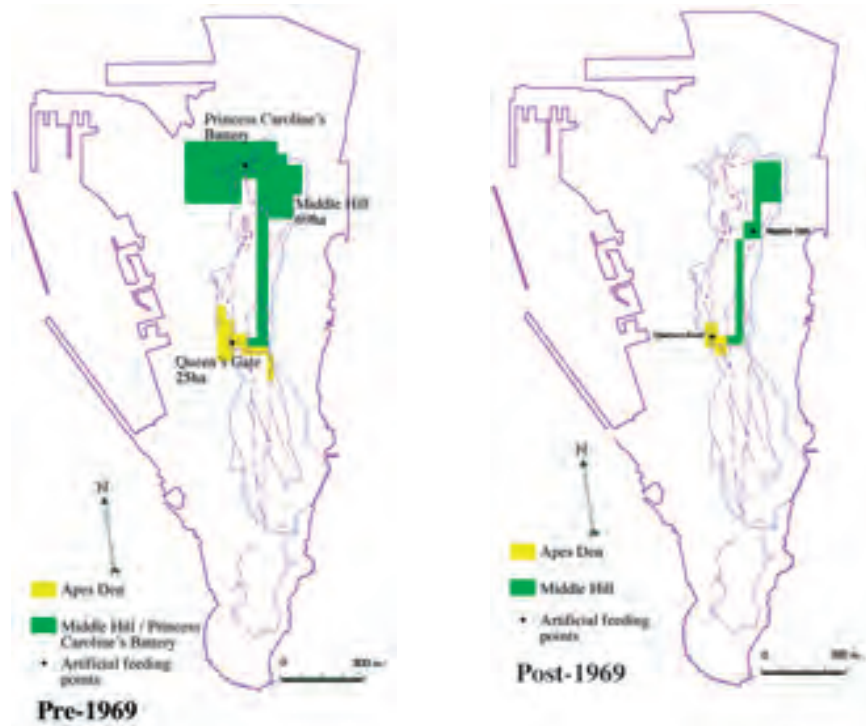


Figure 1. Home range sizes for both Barbary Macaque troops in Gibraltar before and after 1969. Data from MacRoberts and MacRoberts (1970) and Fa (Unpublished data).

The amount of food given throughout this period is difficult to quantify, but the actual expenditure on provisioned food found in the 'Gibraltar Government, Revenue and Expenditure Estimates' gives us an insight into the history of the management of the macaques. This started with £10 from 1940-50, and increased to £81 per animal per year in 1981 (Fa 1984). Roaming and foraging of the macaque groups was reduced (but not halted), possibly as a result of the increase in food supplied. Significantly, the Queen's Gate group greatly reduced its home range, presumably as a result of this and the considerable interaction and feeding by tourists. This is in stark contrast to the Middle Hill group, which although also experiencing a reduced home range, still foraged for extra sustenance.

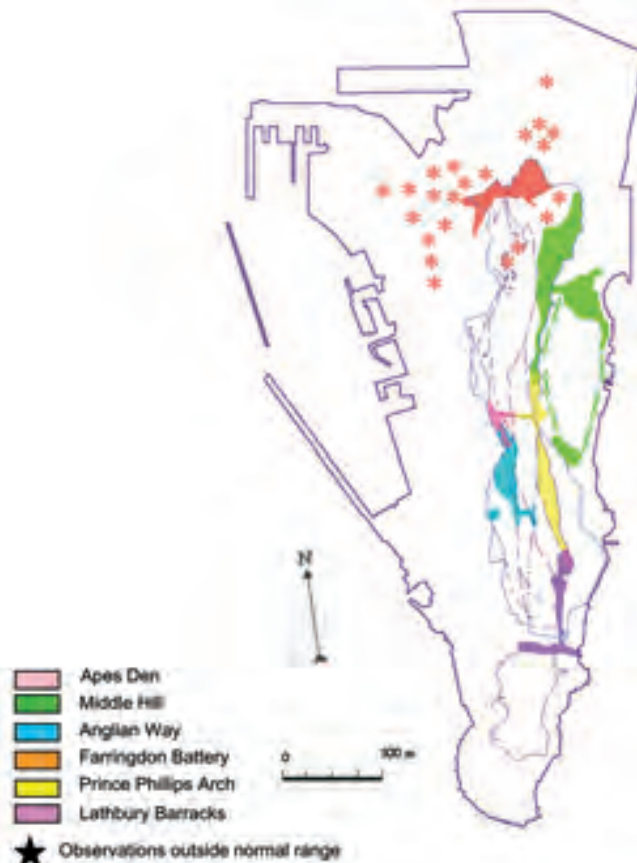


Figure 2. Current home ranges of the macaque groups (2004).

In his conclusions, Fa (1984) stated that there were current problems in overfeeding and overall disturbance from people visiting, and that the effect of this was proving detrimental to the breeding of the species and could present further problems in the future. Although this might be true, what in fact happened was an increase in the population coinciding with a huge increase in visitor numbers. Sights Management made considerable dietary improvements, on advice from GONHS, by providing a range of fruits and vegetables in the early morning and sunflower seeds and peanuts in the afternoon. Water was supplied daily but no vitamin or mineral supplements were provided, although the animals showed no deficiencies (Lewis 1997).

When GONHS took over the feeding, emphasis on “natural foods” and ensuring a nutritionally complete diet in accordance with the ‘Martin Plan’ (Martin 1997) was adopted. Additional nutritional advice was obtained from Dr. Jutta Küster, the biologist responsible for the captive population in Salem and later Daun in Germany. A minimum of 500g per animal per day was introduced on her recommendation. A breakdown of food provisioned during 2000 and 2001 is shown in Table 1 as an example. Recommendations on the feeding and routine management of the sites were undertaken where possible but not all sites have running water for adequate cleaning of the feeding area.

Table 1. Breakdown of food in kg /yr. for the years 2000 and 2001.

Total Amount In kg /year			
2000		2001	
<i>Potato</i>	9042.5	<i>Potato</i>	4512.5
<i>Carrot</i>	6305.0	<i>Carrot</i>	7280.0
<i>Swede</i>	1360.0	<i>Red Cabbage</i>	23.0
<i>Orange</i>	5639.0	<i>Orange</i>	2491.0
<i>Cabbage</i>	3901.5	<i>Cabbage</i>	5176.5
<i>Onion</i>	3627.0	<i>Onion</i>	3655.0
<i>Sweet Potato</i>	899.5	<i>Sweet Potato</i>	67.5
<i>Pear</i>	2607.0	<i>Pear</i>	2085.0
<i>Celeriac</i>	818.0	<i>Cauliflower</i>	486.0
<i>Tomato</i>	1552.0	<i>Tomato</i>	4829.0
<i>Turnip</i>	45.0	<i>Pumpkin</i>	6.0
<i>Apple</i>	5934.5	<i>Apple</i>	7467.0
<i>Cucumber</i>	1552.5	<i>Cucumber</i>	1322.0
<i>Aubergine</i>	10.0	<i>Melon</i>	3180.0
<i>Banana</i>	50.0	<i>Celery</i>	1300.0
<i>Green Bean</i>	20.0		
<i>Total</i>	43363.5	<i>Total</i>	43879.5

It must be stated that the amount of food given in Table 1 supplements the diet of the Barbary macaque. The macaques tend to forage frequently in search of their dietary preferences. This includes berries and wild fruit, roots and leaves and occasionally invertebrates.

14.3 Illegal Feeding

The problems caused by unauthorised feeding of the macaques dates back to the early 1900's when a law was passed prohibiting feeding. This was also incorporated in the 'Nature Protection Ordinance, 1991' (L/N 11 of 1991), but some taxi drivers and tour operators have continued this practice. They entice macaques to their vehicles using a variety of highly calorific and attractive foods such as chocolates and sweets, in the hope of receiving a substantial tip at the end of the tour. Many visitors and even locals do likewise and this has led to overweight and unhealthy individuals displaying lethargic behaviour and developing such diseases as diabetes. Nowhere is this more obvious than with the Ape's Den group, which until recently received the greatest number of visitors. The macaques also then associate humans, and their bags, with food, and tend to accost visitors and grab backpacks, etc., expecting the usual titbits.

Notices at all the sites warn of the dangers that these wild animals could pose, and signs bring to the attention that feeding is illegal and harmful to the animals. However, since there has been no enforcement of this law, many tour operators, taxi drivers and visitors have turned a blind eye. In 2002, the penalty for feeding macaques was substantially increased to £500, and larger signs were erected. There has been a subsequent improvement, but most people continue to feed the macaques. Many of those who chose to continue this prac-

tice have nevertheless realised the detrimental effects that chocolates and sweets were having on the animals due to concerns voiced by GONHS in the press. Now most people tend to feed them pasta, nuts and fruit, which although better food is still unacceptable (pasta and nuts in particular have very high carbohydrate contents and the problem of associating visitors with food continues). In addition, the problem posed by disease transmission through direct interaction is independent of the type of food presented. It must be highlighted that, since macaques are closely related to humans, both species potentially share many diseases.

One can understand the enjoyment of feeding a wild animal, and it also makes for better photographs. So what is the solution? Since there is no enforcement, despite the penalties being increased, the best solution would be to have food packets with appropriate nutritional items on sale to visitors at *only one site*, preferably the Ape's Den. This would supplement the daily requirements of the macaques and would provide an income to support the feeding costs and improve the nature of interactions between the animals and visitors. This of course excludes direct feeding, and food items must be placed on the ground to eliminate the possibility of disease transmission to and from the macaques.

Feeding outside the Upper Rock Nature Reserve, or at sites other than the Ape's Den should still be prohibited. This causes severe problems with groups wandering down to town, establishing themselves around areas where they can access rubbish bins and close to schools and restaurants, where they also receive handouts. They delight the public until such time when they enter dwellings with open windows and raid kitchens, damage and soil cars and washing and try to snatch bags from shoppers and schoolchildren, etc., which they associate with food. When this happens, the authorities have to call out the macaque management staff, which is faced with the unenviable task of luring the macaques back to the Reserve, in the knowledge that there will be a repetition of the problem the following day. Urbanised macaques will not readily become un-urbanised and will ultimately need to be culled. This has been done on several occasions since 1998, and has been the cause of considerable controversy.

This situation could be further aggravated in the future, as the Gibraltar population grows the demands for housing will put pressure on areas of the lower rock for development. This will inevitably mean more interactions with groups of macaques and the residents with an increase in the problems outlined above.

14.4 Population Control

The 'Martin Plan' recommended that the Rock of Gibraltar could accommodate a managed population of 400 macaques in 10-11 groups. With adequate feeding sites and a thinning of the vegetation to provide more foraging and ranging of the groups, it was envisaged that the macaques would be restricted to the Upper Rock Nature Reserve without ranging down to the town area. He estimated that without proper controls the population could reach 400 in 2001 and 800 in 2006. GONHS agreed that the potential population on the Rock could be 400 individuals but the clearing of vegetation would have an adverse effect on other wildlife and erosion would damage sensitive plant life. With this in mind, the suggested 'manageable' population would be in the region of 180 - 200 macaques in a maximum of six groups, and this is roughly the number of the population at the end of 2003 (see Table 2). So how can this number be maintained at a stable level?

Table 2. Status of the Barbary Macaque population on 1st Jan 2004.

Site	Males	Females	Total
<i>Prince Phillip's Arch</i>	31	31	62
<i>Royal Anglian Way</i>	15	24	39
<i>Apes Den</i>	19	18	37
<i>Middle Hill</i>	35	25	60
<i>Farrington Battery</i>	14	12	26
Total	114	110	224

14.4.1 Culling

The number of Barbary macaques in Gibraltar was in the past maintained artificially by the British Army, including the Gibraltar Regiment. This was done by culling animals that allegedly presented a threat to people or property. Also, since numbers had to be kept low, any fragmentation of a group or aggression between young males resulted in the culling of these. Obviously, no publicity was given to this and for years the general public was unaware of this fact, assuming that the population was naturally stable. This clandestine methodolo-

gy only became clearer once culling ceased, with the transfer of management to the Gibraltar Tourism Agency, after which the population levels rose considerably. In recent years, approximately seventy-five animals have been culled as a result of a lack of demand for zoos or wildlife parks to take the surplus animals, and also because of aggressive behaviour on the part of some individuals.

In 1998 a group of macaques from the former Rock Gun/Princess Caroline's group took up residence in the Moorish Castle Estate area, remaining there as they were fed by residents. A decision to cull was taken and about 19 animals were put down.

In 1999 the increase in population levels resulted in a group establishing themselves at Catalan Bay outside the Caleta Hotel. They remained there because of the frequent illegal feeding on the part of tourists and the general public and because of lack of enforcement of the feeding laws. After all attempts to relocate/export the group had been exhausted, the decision to cull them was taken, and the twenty-four animals were regrettably put down.

In 2003 a section of the Middle Hill group again settled down at Catalan Bay outside the Caleta Hotel, as a result of enticement with food items and the presence of the Hotel's refuse bins, that provided the macaques with additional titbits. The macaque management officials were frequently called out to tackle the problem, but the group would descend on a daily basis. They would also frequently make their way across to the sand slopes above Sandy Bay, where workers were dismantling the MOD area of the water catchment's corrugated metal sheets. The problem came to a head in late July, a period when the beaches and the Hotel are full to the brim. This provided the macaques with the greatest interaction with people. There were frequent letters in the Gibraltar Chronicle complaining about this issue, especially by the residents of the area beside the hotel. This led to the controversial decision on the part of the Ministry for Tourism, who instructed the Gibraltar Veterinary Clinic to cull the animals. The Ape Management officials and the GONHS were not fully informed. By the time GONHS had intervened, 27 macaques had been culled, including whole family lineages and mature animals, leaving many females with young on the basis that they were cute. This endeavour was illegal. It was not licensed under the Nature Protection Ordinance and was carried out at random, not respecting the family lineage and hierarchy. It also destroyed very valuable, ongoing data collection and the work of two postgraduate students from Zurich University.

This action led to cancellation, in protest, of the visit of the co-organiser and speaker Prof. Bob Martin to the Barbary Macaque conference in November 2003. In a press statement, Prof. Martin complained about the action taken by the Gibraltar authorities against the group of macaques that had been the focus of an ongoing study for more than two decades. This major setback resulted in a loss of confidence in academic students visiting Gibraltar, an embarrassment to GONHS, particularly on the eve of the conference, and the resulting financial implications, which include £2500 *per annum* in lab fees.

14.4.2 Re-location

The first option to be considered, and the most desirable is exportation. The 'Martin Plan' favoured this, with the possibility of exporting macaques to zoological parks in North America. Another possibility was to re-introduce some animals back into the wild in Morocco (Martin 1997). This is a costly affair, which involves a great deal of time and trouble, but the rewards would outweigh the problems. GONHS embarked in such a project in 1999 when the Farrington group was captured and shipped in a specially chartered Antonov plane to the Wildpark, Daun, in Germany, (see Fig. 1). The cost was borne by the Gibraltar Government and received much publicity in the local press, but at £32,000 it was expensive, and the public purse could ill afford to spend such large sums regularly.



Figure 3. Barbary macaques from Gibraltar, foraging in their new home at Wildpark, Daun, Germany.

Other attempts at exportation have met with political impediments at the land frontier with Spain. Here, the Spanish authorities have blocked attempts to introduce the macaques into the country, even when in transit to other countries, although the animals had their veterinary certificates and CITIES papers in order. A recent export to Portugal was faced with such problems, and the animals eventually had to be transported by air via London. As a result of this, other avenues of population control were investigated, with the possibility of contraception favoured. This would certainly have more public acceptance than culling. In addition, the possibility of re-introduction to Morocco remains and is currently being investigated by GONHS as part of GIBMANATUR, an EU co-funded project under the INTERREG IIIA Gibraltar – Morocco programme.

14.4.3 Contraception

GONHS accepted the recommendations of the 'Martin Plan' to attempt to implant some female macaques with contraceptives every year. This would involve trapping from September to November, and would require about five people dedicated to this operation on a full time basis for the duration of this period. An estimate of the costs was prepared by GONHS for one of the groups and is reproduced in table 3.

Table 3. Implanting of females at Middle Hill 1998 (taken from Martin (1997)).

Staff & Equipment	Duration (weeks)	Cost (£)
Feeding cage		2,500.00
Veterinarian from Salem	1	1,000.00
Dr. Walter Angst (Salem).	1	1,000.00
Travel costs for Salem team.		1,000.00
Accommodation for Salem team	1	500.00
GONHS personnel (5 including one veterinarian)	3	5,000.00
Transport, etc	3	1,000.00
Tranquilliser darts, and related equipment etc.	3	5,000.00
Total		17,000.00

Dr Walter Angst, the Managing Director of the macaque park at Affenberg, Salem, would train GONHS personnel, who would be able to carry out the work in future years, and the veterinarian from Salem would do likewise with the local vet. These costs and the construction of the feeding cage would not be incurred in future years. Initially, only a representative from Zurich University would be needed for the collection of samples for the ongoing genetic work and to supervise the operation. The recurrent expenditure would be in the region of £13,000. This, multiplied by the number of groups, works out to between £50,000 and £65,000 *per annum* plus the cost of the contraceptives. It was felt that the cost should be borne from the entrance fees to the Upper Rock Nature Reserve. Bearing in mind that the Barbary macaques are the main attraction for tourists visiting the Rock, the Gibraltar Tourism Agency should re-invest whatever is necessary into maintaining a healthy and well-managed macaque population, which after all is its key product in the Nature Reserve. Unfortunately this project never got off the ground.

Recently, in early 2003 GONHS, together with the Veterinary Clinic, managed to acquire a new contraceptive that was effective for a period of two years. These implants could be applied at any time of the year, even to pregnant females that would, after giving birth, remain sterile for the rest of the period. Females from all the groups are presently being implanted with the contraceptive, leaving a few to rear young so as not to disrupt the cohesion provided by the interactivity of sexes and ages within the groups. The ability to work throughout the year and the duration of the implants has reduced the cost of the exercise and made it viable. At the time of writing eleven females have been implanted.

14.5 Routine Management

In the 'Martin Plan', Prof. Martin made a number of suggestions that GONHS listed as a number of recommendations. These are reproduced here together with the action that has been taken.

a) Feeding of the six groups should be in set locations. At present the sixth group (Formerly at Rock Gun) has no set location. This should now be relocated at the bottom of Green Lodge Road. The MOD is now considering the acceptability of this option as regards radiation hazards.

The sixth group moved down from Rock Gun to the Upper Galleries and was then enticed down to a fixed feeding point at Farrington Battery. This group was exported to Wildpark, Daun, Germany in 1998, but re-formed from some animals that had evaded capture and a

few additions apparently from Middle Hill. They are still provided for at Farringdon's.

b) Feeding should be twice a day, at 07:00hrs and 16:00hrs.

This practice was not fully adopted. The need to have staff on duty further hours was costed, but the funds were not provided. Instead, a second feeding of seeds and grain is carried out at 13:00hrs.

c) Only natural foods should be used and should include native species such as figs *Ficus carica*, and the fruit of the strawberry trees *Arbutus unedo*, when in season.

Natural foods have been encouraged since then whenever possible, and when in season. Figs have been supplied but strawberry tree fruits are not grown for commercial purposes, and therefore it has been impossible to find these. The groups have been provided with fresh fruit and vegetables and this has been augmented with grain that the macaques quite enjoy.

d) Two of the groups should be out of bounds to tourists and other visitors except for approved research purposes.

Obviously, it is very difficult in a Reserve the size of the Upper Rock Nature Reserve to restrict visitations to not one, but two groups, particularly as there is no direct on-site management or wardening. The only group that fulfils this criterion is at Middle Hill, where the security fences erected by the military have shielded the interaction of this group with humans to a large extent. This does not restrict the movement of this group within that area and interactions with tourists and other visitors do occur outside. However, this is limited. This group, therefore, is considered the most suited for research purposes that do not involve interaction with man, as they remain in a fairly wild state. Since the summer of 2003, members of this group have been frequenting the east side down by the Caleta Hotel where they interact with humans. Twenty-seven members of this group were culled between July and August 2003. Despite this, individuals of this group continue to visit the area.

e) One group should be accessible to visitors only on foot.

This would have been an ideal concept were it not for the fact that Sights Management and the Tourism Agency allowed the taxis access to all the upper roads on the Rock, which had been exclusively for essential military vehicles, and the only area where visitors could walk free of traffic pressures. The few groups that could have been accessed on foot, the Anglian Way group and the remnants of the Farringdon Battery group, were enticed with food away from those areas by taxi drivers and can now be found at the road by Hayne's Cave pumping station and the lookout and entrance to Princess Caroline's Battery.

f) Three groups should be visited in rotation only for one month at a time.

So as to avoid too much visitor pressure, GONHS recommended that all visitors should be allowed access to only one site for a month at a time. This proposal was never adopted, as it would have involved too much traffic congestion at the single site and would not have been favoured by the tour operators, although the proposal was sound.

g) Feeding of the monkeys is at present contracted out to Sights Management Ltd. This will have to continue while the contract lasts, but direct supervision of this should now be contracted out to GONHS in a manner similar to the gull cull arrangement where GONHS supervises a team from Community Projects Ltd. The post of Ape Keeper, recently vacated by resignation, should therefore not be filled by Sights Management and the money saved should be redirected to GONHS to employ a person to supervise year round macaque management.

Shortly after this report was submitted to GONHS the Tourist Board ended its contract with Sights Management Ltd. The Tourist Board continued the management of the monkeys, engaging the staff employed to feed the macaques for a further two years, after which management of the Barbary macaques was contracted out to GONHS. The experienced feeding staff was kept on and Mr. Eric Shaw, who had formed part of the MEDAMBIOS management plan back in the 1990, was appointed to take charge of supervision, feeding and management. This arrangement continues at present with the support of the Gull Cull unit, which supplies manpower to provide cover at weekends.

h) GONHS should also be entrusted, under contract, to establish an interpretation centre exclusively on macaque biology, to produce an up to date brochure on the macaques and to provide trained guides.

An interpretation centre in at least one or two of the most visited sites is essential. At the Queen's Gate site there is sufficient area to build a covered/indoor centre that would provide all the required information on the history, biology and future of the macaques. This should also focus on the commercial aspect of these animals, where you have the opportunity to sell souvenirs and additional information on the biology and natural history of the macaques. It is unfortunate that the Gibraltar Tourist Board has not taken this recommendation on board and has not budgeted for this. Indeed, creation of interpretation facilities should have been

provided for by the Gibraltar Tourist Board as part of the current management contract with GONHS. Instead, we still have the old souvenir vendor at his rundown wooden kiosk at the Ape's Den.

14.6 Other Recommendations

1) Steps should be taken, always in consultation with the Anthropological Institute of Zurich, to import a number of macaques from Morocco in order to introduce new genetic material.

This is a step that should be taken, given that recent studies have demonstrated that the population of macaques on the Rock are beginning to show the effects of inbreeding, although there still is a high level of genetic variability, showing that there is still time to counter its effect before it is too late.

2) It is proposed that the British Government, through the Convent, formally make contact with the Government of the Kingdom of Morocco to attempt to organise a re-introduction programme of Gibraltar animals to Morocco.

This proposal should counter the problems of inbreeding and ensure genetic variability that will maintain future populations of macaques in a healthy state. With the right contacts, GONHS should be able to achieve this venture and there should be fewer problems and a greater chance of success than that endured at the Spanish frontier, with exportation problems. There should ideally be a two-way exchange of animals to increase genetic variability in both populations. This is now being studied by GONHS and the Institut Scientifique in Rabat as part of the INTERREG IIIA Programme.



Eric Shaw / GONHS

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A photograph of a Yellow-legged Gull perched on a branch, with another gull visible in the background. The gull is white with a yellow beak and legs. The background is a blurred landscape with a body of water and a distant building.

15. The Yellow-legged Gull

15. The Yellow-legged Gull

*This chapter consists of a summary of the history and current situation regarding the status of the yellow-legged gull, *Larus michahellis*, in Gibraltar. A more complete appraisal of the current status of this species in Gibraltar can be gathered from Cortes et al. (2004) and the annual reports that the GONHS prepares for the Ministry for the Environment.*

15.1 History

The yellow-legged gull *Larus michahellis* (formerly *Larus cachinnans*) is the most common, and certainly most conspicuous bird that nests in Gibraltar, but this has not always been the case. Although it was recorded in the 19th and early 20th Century by several writers, amongst them Saunders (1871), Irby (1895) and Verner (1909), it was not until 1934 that Rait-Kerr mentions definite breeding (Cortes et al. 2004). Since then, the population of this species has slowly increased, mainly breeding on inaccessible sea cliffs around the ridge of the Upper Rock and the south district.

In the 1970s the nesting population was estimated to be 600 breeding pairs (Cortes et al. 1980). Nesting extended to roofs in the town, and exposed areas within the Upper Rock became the focus of the gulls as they extended their breeding grounds. One particular site, Rock Gun and the adjacent cliffs on the North Face of the Rock, was the cause of grave concern to the Royal Air Force. The first flight of the fledged chicks would take them down to the runway where the risk of a collision with an aircraft was menacing. In fact due to several bird strikes and the resultant damage to aircraft, the RAF decided to carry out a gull cull. This cull, which commenced in the spring of 1979, focused not only on the eggs and chicks, but also on adult birds using the stupeficient alpha chloralose, and took place during the birds' breeding season. The main area covered was the northern end of the Rock, which posed the greatest threat to the aircraft landing on or taking off from the runway. This obviously did not curtail the increase in the population, as other areas were not covered, and the yellow-legged gull continued its expansion throughout the rest of the Upper Rock and other areas around Gibraltar.

In 1982, as a result of a substantial and visually obvious increase in the population, the RAF extended its operation to include other areas of the Upper Rock and the south district. This practice continued on a yearly basis during the breeding season, targeting eggs and chicks almost exclusively (a method that is known to be largely ineffective) until the MOD reduced their presence in Gibraltar. Finlayson (1992) estimates the population at 2500 pairs, although Cortes et al. (2004), gives a much higher estimate based on a survey by Mr. Peter Rock (*pers. comm.*), of 30,000 birds at the end of the nesting season. The Royal Gibraltar Regiment then continued with the venture, but by 1999 a combination of ineffective methods and reduced culling meant that the gull population had grown to enormous proportions.

GONHS had been monitoring the situation and was well aware of the detrimental effects this increase could have on the stability of the natural environment within the Upper Rock Nature Reserve, as has occurred elsewhere. It was also conscious of the problems the gulls were causing to the residents of the town area, and presented some suggestions to the authorities. These arguments were accepted and a contract was awarded to GONHS. The Gull Control Unit was therefore created in July 1997. This unit was tasked to control and cull the gull population throughout the whole year as opposed to culling only during the breeding season as had taken place in the past.

15.2 Control

All areas in Gibraltar were targeted, but obviously the upper reaches of the Nature Reserve and the eastern slopes were the most densely populated. Several methods were examined and used, and for the first three years poison, hand nets, nest raking in the breeding season, and catapults were the main techniques employed. Results during this period were insufficient to make any significant inroads into the large population. Finally in 2000 the acquisition of air rifles greatly improved the situation. Nest raking and the destruction of eggs continued during the breeding season, but by far the most successful method was the targeting of adult birds. By killing the adult bird, the nesting success of the pair had been eliminated, whereas birds that are relieved of their clutch of eggs very often lay a second brood. The yearly results to date, shown in table 1, demonstrates the efficient and substantial elimination of a large percentage of the population.

Table 1. Methods and totals of gulls eliminated during the period 1997-2003.

Year	Method	Total Culled (including chicks and eggs)
1997 (<i>Jul. to Dec. only</i>)	Poison; hand nets; catapults	50
1998	Clap nets; catapults; nest raking	1760
1999	Catapults; nest raking	2498
2000	Shooting	4298
2001	Shooting	3952
2002	Shooting	4056
2003	Shooting; nest raking	5025

The effects, as shown in table 1, have been quite noticeable. From an observer's point of view, 2003 saw a considerable reduction in the yellow-legged gull population. There was one passing comment of the gull problem in the press and call-out requests for removal of gull nests dropped from 47 in 2001 to 22 in 2003 (Cortes *et al.* 2004).

Other methods of control have been considered by GONHS. A captive breeding programme of the red fox, *Vulpes vulpes*, with the intention to re-introduce the animals, commenced in 1992. These animals would consume large numbers of eggs and chicks and the occasional adult bird. Moreover the disruption caused to the breeding colony would deter many pairs from nesting, as evidenced from the effect of foxes on seabird colonies in other parts of the world. The programme has so far been unsuccessful, but in mid 2003 an adult was released after having been fed constantly on a diet of gull chicks. It has now set up territory and hopefully will continue to wreak havoc on the gulls.

A pair of ravens, *Corvus corax* nested in Gibraltar until 1972. These large crows predated on the chicks and eggs of the yellow-legged gull, and it was unfortunate to lose them probably due to poisoning in Spain, just as the gull population was increasing. GONHS had thought of a re-introduction programme and two were secured from Jerez Zoo for captive breeding purposes. As luck would have it a pair was seen in early 1999 and shortly after, attempted to breed below Royal Anglian Way. The pair was unsuccessful but during their stay they were seen to harass the breeding gulls and must have fed on many of the eggs and chicks available close by. What is certain is that these birds have taken a liking to feral pigeon chicks (another problematic species) and regularly feed on these in the area behind Catalan Bay (V. Robba, *pers comm.*). Since then, the pair of Ravens has remained in the vicinity, returning to Gibraltar and attempting to breed every year since. In the process, they have now become a major predator of the gulls, especially during the breeding season when they cause the most disruption.

Another form of control that was successfully utilised as from 2000 by GONHS included the use of the raptors of the GONHS 'Bird of Prey Unit'. A Harris hawk, *Parabuteo unicinctus* was trained to catch juvenile and immature gulls, mainly at the runway, Hole-in-the-Wall and Windmill Hill. The following year a female goshawk, *Accipiter gentilis* and two hybrid gyrfalcon x saker falcons, *Falco rusticolus* x *F. cherrug* were also used against the gulls. A female Bonelli's eagle, *Hieraetus fasciatus* was also flown along the eastern side sand slopes causing immense disruption of the breeding pairs of gulls there. This eagle was subsequently released in early July 2003, after a substantial diet of young gulls, and remained in the area until early August when it was last seen. The hope is that this eagle will return in the breeding season to the Rock and entice a male to set up a breeding territory, but that has so far not happened.

In 2002 a group of observers from the Royal Air Force Ornithological Society participated in a project, formulated by GONHS, to determine the breeding population of yellow-legged gulls in Gibraltar. The survey, which accounted for non-breeders, placed the total figure at 20,090 birds (Cortes *et al.* 2004). Compared to less comprehensive surveys carried out by GONHS in 1998, 2001 and 2002 that estimated the population at 30,000 birds, the figures display a 39% reduction of the population and augers well at maintaining and controlling the numbers of yellow-legged gull in the future.

Table 2. Estimated number of gulls present at end of nesting season. RAFOS Survey.

Adult nesting birds	8036
Non-breeders	4018
Fledged young	8036
Total	20,090

15.3 Discussion

It is gratifying to see that the Gibraltar Government has had the confidence to confer the responsibility of the management of the yellow-legged gull population to GONHS. In the past, culling was launched primarily to safeguard the aircraft landing at RAF Gibraltar. This did not stem the huge increase in the population, which was due in part to the expansion of the human population in the region. This resulted in several rubbish tips that were targeted as a food source by the gulls. However, the Los Barrios tip may soon close, and this could have a serious and welcome impact on the gull population in Gibraltar. This factor may contribute to the eventual decrease in numbers, but the authorities must not be complacent. The problem needs continual control and systematic culling if these numbers are to be maintained at an adequate level that will ensure the impact to the general public is kept at a minimum.

15.4 Recommendations

1) There is a need to reconfigure and analyse the gull cull strategy of the last decade in order to prepare the ground for the next ten years. This analysis has been partly done in the paper by Cortes *et al.* (2004) 'The Control of the Yellow-legged Gull in Gibraltar', which deals with the matter more thoroughly than the overview that this chapter provides.

2) Prepare a gull control management programme based on the research and experience gained over the last few years. This plan to collaborate with the general management plan for the Upper Rock Nature Reserve, since a large proportion of Gibraltar's gull population breeds in or around the Nature Reserve.



yellow-legged gulls

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16. The Lower Slopes

16. The Lower Slopes

The lower slopes of the Upper Rock extend in a north-south direction for about 300m, from the area known as Calpe to Devil's Gap. They run from an elevation of about 160m above sea level below Queen's Road down to 90m above sea level behind Arengo's Palace and Sacred Heart School. The site covers about 30 000 m² (7 acres), sits on a bed that is partly shale (Rose & Rosenbaum 1991) and is an extremely interesting and important area for local flora (Linares 1990). Its position relative to the Upper Rock Nature Reserve can be seen on the map below.



Figure 1. Map of Gibraltar, showing the position of the lower slopes in relation to the Upper Rock Nature Reserve. The Nature Reserve is shaded in green, whilst the area shaded in yellow represents the lower slopes.

The lower slopes are intercepted by two gullies that run from east to west, and cliffs bind the southern end. A number of habitats occur on the lower slopes, including some that are practically unique to Gibraltar, such as open, grassy areas, shady, damp areas, rocky outcrops and cliffs, and the garigue and maquis that are characteristic of the Upper Rock (Linares 1990). It is this that makes the area such an important one for flora, and about half of Gibraltar's plant species can be found growing on the lower slopes. Of these, 27 species are protected under Part II, section 11 of the 'Nature Protection Ordinance 1991' (L/N 11 of 1991) in that they are not specified under Schedule 2 of the Ordinance (Schedule 2 specifies all plant species found in Gibraltar that are *not* protected by law). These include most of the orchids found in Gibraltar, and these are discussed in the section below. Other than orchids, some rare plant species are also found on the lower slopes. These include:

<i>Scandix pecten-veneris</i> L.	(shepherd's needle)
<i>Parentucellia viscosa</i> (L.) Caruel	(yellow bartsia)
<i>Lavandula multifida</i> L.	(cut-leaved lavender)
<i>Linum bienne</i> Miller	(pale flax)
<i>Lathyrus setifolius</i> L.	(narrow-leaved red vetchling)
<i>Anagyris foetida</i> L.	(bean trefoil)
<i>Selaginella denticullata</i> (L.) Spring	(clubmoss)

Of these, *Scandix pecten-veneris* is found nowhere else in Gibraltar.

16.1 Orchids

The lower slopes are particularly rich in, and important for orchids. The following species of orchid occur on the lower slopes:

<i>Ophrys lutea</i> (Gouan) Cav. subsp. <i>lutea</i>	(yellow-bee orchid)
<i>Ophrys fusca</i> Link subsp. <i>fusca</i>	(brown-bee orchid)
<i>Ophrys speculum</i> Link subsp. <i>speculum</i>	(mirror orchid)
<i>Ophrys bombyliflora</i> Link	(bumble-bee orchid)
<i>Serapias parviflora</i> Parl.	(small-flowered serapias)
<i>Spiranthes spiralis</i> (L.) Chevall	(autumn lady's tresses orchid)
<i>Gennaria diphylla</i> (Link) Parl.	(two-leaved gennaria)

Ten species of orchid occur in Gibraltar. Seven of these are found on the lower slopes. This makes the lower slopes the stronghold for the orchid family in Gibraltar. Of the seven species that grow here, one species, *Ophrys speculum*, grows nowhere else on the Rock.

The more open habitat that is provided by the lower slopes is ideal for the growth of orchids, and these grow mainly below cliff-faces and north-facing sides of gullies, where shaded, damp conditions that are important for these plants prevail (Linares 1988, 1990, 1994). A map showing the distribution of orchids within the lower slopes is shown in Fig. 2.



Figure 2. Map showing the distribution of orchids within the lower slopes area. Sites where orchids grow are shaded in green.

In addition to the lower slopes, the deep gully that runs south of Willis's magazines (above and to the north of the lower slopes) is also important for orchids (Linares 1988), and this area falls within the Nature Reserve boundary. The complete distribution of orchids in Gibraltar can be seen on the map in Fig. 3.



Figure 3. Map showing distribution of orchids in Gibraltar. As can be seen, there are scattered populations on the Upper Rock and one on Jacob's Ladder, but the most extensive site where orchids are found is the lower slopes area.

The three other species of orchid that are found in Gibraltar all occur within the Upper Rock Nature Reserve. These are listed below, together with an account of their distribution.

Anacamptis pyramidalis (L.) L.C.M. Richardson (pyramidal orchid)
 Only three plants found along the Mediterranean steps up to the mid 1990s (Linares 1994). Now thought to be extinct.

Ophrys tenthredinifera Willd. (sawfly orchid)
 Very Rare in Gibraltar. Only found in Willis's Gully and along St. Michael's Path.

Ophrys apifera Hudson subsp. *apifera* (bee orchid)
 A few individuals of this locally very rare plant can be found along St. Michael's Path and at Jew's Gate.

In most European countries, all orchid species are protected by law (Linares 1990). This is the case in Gibraltar, where all ten orchid species are protected under Part II, section 11 of the 'Nature Protection Ordinance, 1991'. For more information on the status of orchids within the Nature Reserve, see Appendix 2.1.

16.2 Fauna of the Lower Slopes

The lower slopes are also important for indigenous fauna. As with the rest of the Upper Rock, this area is of unquestionable importance for birds, particularly passerine migrants. It is also one of the only sites in Gibraltar where the woodchat shrike *Lanius senator*, (which is given a SPEC category of '2' and is deemed to have a 'vulnerable' European threat status by BirdLife International (Tucker & Heath 1994)) is suspected to have bred in the past. Given the impressive diversity of its flora, the lower slopes are also of extreme local importance for invertebrates, and in particular phytophagous insects. A combination of this area's features (and in particular its relatively open habitat) also make the lower slopes an important habitat for local herpetofauna. The ocellated lizard *Lacerta lepida*, once considered abundant on the Rock (Ayala 1782; Cortes 1982), has now all but disappeared due to the changing nature of the vegetation (Cortes 1982) and the lower slopes area, with its open habitat, could be one of the few places where this species continues to survive in Gibraltar.

16.3 Habitat Succession on the Lower Slopes

Since the late 1700s, the whole of the Upper Rock and the lower slopes were bare of trees, these having been removed by the garrison to use as fuel during times of siege (Cortes 1994; Linares 1994). Subsequently, goats roamed the whole of the Upper Rock, keeping the vegetation low and treeless. The lower slopes were eventually cut off from the Upper Rock through the erection of the 'unclimbable fence'. Goats remained on the lower slopes, but were excluded from the Upper Rock. This led to an increase in the height of the vegetation of the Upper Rock that eventually led to the present maquis, but the habitat on the lower slopes remained open due to the continued presence of goats (Linares 1994), as well as persistent clearing of the lower slopes by the military, who managed the area for security reasons. This can be seen in Fig. 4.



Figure 4. The lower slopes in the early 20th Century.

Although the habitat on the lower slopes is still more open than the majority of the Upper Rock, there are now very few goats in the area (and these were introduced relatively recently, having been absent for about forty or fifty years) and the vegetation is no longer cleared. Therefore, the vegetation is gradually becoming taller and thicker. This will eventually become maquis like that of the Upper Rock if nothing is done to control it. Some form of habitat management is therefore important for this area if it is to remain such an important site for local flora (Linares 1994). The development of the lower slopes from the 1970s to the present day is shown in Fig. 5.



Figure 5. The photograph on the right shows the vegetation on the lower slopes during the late 1970s, whilst the one on the left shows the same area in 2003 (photos courtesy L. Linares).

16.4 Other Threats

In 1993, some local developers, notably RLS, together with the Japanese firm Kumagai Gumi, expressed an interest, which was entertained by the Gibraltar Government, to construct a road that would link the Calpe area with Green Lane. This road would take traffic from the Upper Rock and direct it to Europa Road by the entrance to the Casino, after passing through a new tunnel under Devil's Gap. The construction of this road would have gone hand in hand with major urban developments, as it was intended to construct houses on both sides of the new road. The project would have obliterated virtually all the lower slopes. GONHS strongly objected to these plans and held a number of discussions with the developers and Government. At these discussions, the value of the lower slopes to plants and animals was highlighted, as well as the possibility that the intended outcome would not be achieved. Traffic would have to take a sharp right turn on entering Europa Road, and the residences planned would generate considerable traffic themselves. GONHS argued that it appeared more like a moneymaking exercise for those involved than a true attempt at solving the traffic problem. The high cost of the works and the impact on the upper town were also arguments used. Eventually, these arguments won through and the plans for the road and associated development were shelved. Furthermore, Town Planner Mr. Paul Origo recently suggested to us that the construction of a relief road at Willis's could be avoided with the proper management of traffic within -and consequently descending through the Upper Town area from- the Nature Reserve. This could include redirection of traffic through the Great North Road.

16.5 Recommendations

Given the unquestionable importance of the site for flora, the lower slopes of the Upper Rock should be protected under Part III of L/N 11 of 1991, *i.e.*, it should be regarded as an area of special interest that is protected for the purpose of nature conservation. Thus, the present boundary of the Upper Rock Nature Reserve should be extended to include the lower slopes.

It would be advisable to manage the vegetation of the lower slopes, as this would ensure that the vegetation remains open and does not develop into the thick, virtually impenetrable maquis that is characteristic of large parts of the Upper Rock. This would improve the area's value for flora. This action is essential if the lower slopes are to remain such an important site for indigenous flora. It would also benefit animals that are dependent on open areas such as the ocellated lizard *Lacerta lepida*, which may still survive in the area. A reintroduction programme would also be of considerable benefit to the local population of ocellated lizard. In this sense, the introduction of a large herbivore such as the Barbary sheep *Ammotragus lervia* (see Chapter 13) may be beneficial to the management of the vegetation of the Lower Slopes.

Given the rarity of all orchid species in Gibraltar, the level of legal protection afforded to the orchid family (Orchidaceae) should be elevated so that all species of orchid are included in Schedule 3 of the 'Nature Protection Ordinance, 1991'.

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17. Research, Monitoring and Education

17. Research, Monitoring and Education



Bruce's Farm Field Centre

Research and monitoring programmes are fundamental tools in the development of the management of the Upper Rock Nature Reserve; these rely on the Nature Reserve for their data, with the Nature Reserve in turn benefiting from their results and conclusions. Their application allows the researcher to obtain the necessary information on different aspects of the environment and their inter-relationship with socio-economic factors. These can then form the basis for the planning and use of the resources within a Nature Reserve (EUROPARC-Spain 2002), thus ensuring that activities occurring within the Nature Reserve are compatible with the sustainability of the 'products' of the Nature Reserve (i.e., wildlife and heritage in the case of the Upper Rock).

Only monitoring programmes with continual research and investigation can assess the impact of decisions taken in the management of a Nature Reserve. These will serve to diagnose changes in environmental and socio-economic activities, and in the long term will provide indicators to continually upgrade the development of the Reserve and its management plan. The results of these programmes will indicate the level of success and effectiveness of the objectives set in the management plan (EUROPARC-Spain 2002), as well as any subsequent decisions made and plans put into place by the management of the Nature Reserve. It is crucial that adequate funding is set aside to address these two factors as a fundamental part of the overall plan, in order to guarantee the success of a properly structured and well managed Nature Reserve.

In addition to research, the Upper Rock Nature Reserve has a lot of potential as a site within which to base school and university field trips and excursions. All aspects of research, monitoring and education are discussed within this chapter.

17.1 Research

Scientific research has over the years been carried out in Gibraltar on a wide variety of subjects, but has mainly centred on fauna, flora and other natural aspects. This has often formed part of the work carried out by university students, but Gibraltar-based amateurs have also carried out other studies that have been just as important to the Upper Rock. These studies have together resulted in a wealth of information that has allowed us to evaluate the principal resources that can be applied to programmes dealing with conservation and sustainable development. The application of these results was fundamental in the designation of the Upper Rock Nature Reserve, and today research on both natural and historical aspects continues on a regular basis.

Amongst locals, studies on the Upper Rock are carried out almost exclusively by GONHS, and recently by the Gibraltar Museum in archaeological digs in caves. In recent years numerous students from foreign universities and institutes have been carrying out research on a number of disciplines on the Upper Rock, in cooperation with and co-ordinated by the GONHS. The acquisition of Bruce's Farm was instrumental in the development of a research centre where these students can effectively carry out their studies within the confines of the Nature Reserve. The different forms of research that take place within the Upper Rock Nature Reserve are highlighted in this chapter, and ways in which to improve the Upper Rock for these purposes are examined.

17.2 The Biological Reserve

As part of GONHS's on-going work in the field of conservation, negotiations had been taking place with the MOD to use the area of Rock Gun and Middle Hill as the prime location for the introduction of large species of mammals, such as the Spanish ibex *Capra pyrenaica* or Barbary sheep *Ammotragus lervia*, with a view to introducing them to other areas of the Upper Rock Nature Reserve. This locality was identified as suitable because of the restricted and isolated character of the area, and also because the topography suited these species.

The area of Rock Gun and Middle Hill also harbours most of Gibraltar's endemic and endangered species of flora, and holds stable populations of the Barbary partridge *Alectoris barbara*, a pair of peregrine falcon *Falco peregrinus*, and notably an eagle owl *Bubo bubo*, a species that nested in this particular area until the early 1900s, and has recolonised the Rock. It also supports the group of macaques that is commonly known as the 'wild' pack, which has been studied intensively by numerous university students from around the world.

Taking into account the importance of its biological wealth and the isolated nature of the area, where flora and fauna flourish with relatively little interference by man, it was decided to propose this area as a Biological Reserve. Biological Reserves are found in many Nature Reserves. They

are composed of special areas of particular importance to the flora and fauna of the locality that require that extra amount of protection. They also serve as control areas where, due to the restriction of visitors, monitoring and research programmes are carried out with little external interference. One of the aims of Biological Reserves is also to promote these research programmes, as these will ultimately benefit the rest of the reserve. Access is, quite naturally, strictly controlled in these areas.

In April 2004, the MOD handed a large percentage of their land holdings to the Gibraltar Government. Rock Gun and Middle Hill were included within this package, with the final hand-over date being April 2005. It is imperative that the Gibraltar Government realise the ecological importance of this area and take on board the authors' suggestion to designate the area as a Biological Reserve. The rest of the Upper Rock Nature Reserve is already under intense visitor pressure, and as a result bears the scars of years of neglect. This area can do without this. It has much to offer in the way of providing an isolated location for the re-introduction of flora and fauna that can then be relocated to other parts of the Nature Reserve. It also provides a unique opportunity for conserving healthy, untouched populations of Gibraltar's most important and endangered taxa.

The Rock Gun and Middle Hill area is already one where much biological research is taking place, in conjunction with GONHS and its research facility at Bruce's Farm. The site could bring many more people to study a wide variety of subjects concerning the biology and conservation of Gibraltar's special wildlife. However, this can only be sustainable if the focus of the study is kept free from interference and interaction by man, particularly if visitor densities are high. Having said this, there is scope for visits for a limited number of people. Authorised, guided visits to the Biological Reserve could be available to small groups. The guide, preferably a Nature Reserve warden with experience and knowledge in the field of natural history, would conduct these visits along approved routes, preferably along the roadway. No interaction with the macaques or any other animals would take place and an appropriate distance would be maintained from these. Visits should not take place on a daily basis, and should be pre-booked. Visiting frequency and visitor numbers should vary according to the seasonal requirements and sensitivity of the wildlife of the Biological Reserve, and should always be kept low. Visitors wishing to enter the Biological Reserve should pay an extra fee, the proceeds of which should all be invested in the maintenance of the site.

A scientific body should supervise and administer the Biological Reserve as part of the Nature Reserve. This body would perform the role of natural history consultants to the Management Board of the Upper Rock Nature Reserve. At the moment this role is performed by GONHS for the whole of the Nature Reserve. This should include, not only consultation, but also discussion, arbitration and decision making processes.

The Biological Reserve should be conditioned to meet the needs of a biological centre. With this in mind, some of the old buildings at Middle Hill should be provisioned with facilities that provide, encourage and meet the basic requirements of researchers working in this area.

Provisioning of watering and feeding areas for the macaques would continue to be supplied and maintained by the Gibraltar Government or their contracted or authorised managers. Watering holes for the large herbivores must be constructed to suitable dimensions and the area must meet the approval of the scientific body before the animals are introduced.

17.3 Monitoring

Monitoring should begin as soon as the management plan comes into effect. This should address both environmental and socio-economic aspects of the Nature Reserve. The development of monitoring programmes should form an integral part of the management plan and its application. The requirements of this monitoring would be structured around certain objectives and problems that need evaluation and diagnosis over the long term, providing an indication of the effectiveness of management programmes. Monitoring of certain aspects of the environment, heritage and socio-economic problems have been accomplished by the authors in an effort to analyse and assess the overall state of the Nature Reserve. This should form the template for ongoing, long-term monitoring programmes for conservation and sustainable development in the future. All projects and developments within the Nature Reserve should be monitored closely, and their effect on all aspects of the Nature Reserve taken on board in any future plans and actions.

17.4 Field Courses

Several factors make the Upper Rock Nature Reserve an ideal place in which to host field courses by both schools and universities. However, until now, this resource has been under-exploited. Facilities for hosting these field courses do exist within the Nature Reserve. The Gibraltar Trust for Natural History's premises at Bruce's Farm are ideal for hosting small field courses (of up to sixteen persons). However, although individual students and researchers have been using the facilities on a fairly regular basis for a number of years (mainly for work on macaques)

university field courses have been lacking. In fact, the first field course to be hosted at Bruce's Farm took place over the end of March and the beginning of April of 2003, during which the University of Leeds, liaising with GONHS, held its undergraduate Ecology field course here for the first time, and did so again in 2004. Dr William Kunin, senior lecturer in Ecology at the School of Biology of the University of Leeds, led this field course. We asked him for his opinions on the Upper Rock and Bruce's Farm as a place at which to hold field courses, and his views are given next. Since Dr Kunin commented on a range of aspects, and not just matters of research and monitoring, all of his comments have been included in the following section.

17.4.1 Dr Kunin's Views

"The Upper Rock is very useful as a venue for field courses. It has a range of habitats, all of which are at an easy walking distance from the field centre at Bruce's Farm. The Nature Reserve also holds several species that are charismatic and accessible (such as the Barbary macaques), and these appeal to the students. The Bruce's Farm field centre is particularly useful. There are very few places in the Mediterranean that have adequate facilities and have easy access to the sites at which the research is being carried out. Bruce's Farm is one of these places, and is particularly important in this respect. Also, many global conservation problems are happening in Gibraltar in a visible way, albeit on a smaller scale. It is thus a good place for students to get a visible picture of what is the bigger problem."

"Some improvements could be made to the field centre, such as increased bed space or more showers¹. More can be done with the grounds at Bruce's Farm, particularly the garden where representations of indigenous habitats can be simulated and these can be utilised for the purposes of manipulative field experiments (although this would take a lot of work!). Local endemics can also be grown. The same can be said of the nearby former plant nursery, which can also be utilised to grow trees that were presumably once present on the Rock in order to repopulate the Rock with its original trees and replace some of the Maquis with Mediterranean woodland. The reintroduction can also be carried out experimentally, and students can use this in itself as an area of study."

"More generally, the Upper Rock Nature Reserve faces several challenges. Firstly, the Nature Reserve seems to be quite an earner, and some of the money made should be used to improve the park. As the saying goes, 'You have to keep feeding the goose for it to keep laying golden eggs'."

"The management of the Upper Rock Nature Reserve should be improved. In particular, stronger enforcement of existing laws is required. This is particularly the case with the macaques. The worst offenders should primarily be targeted, and these seem to be tour operators such as coach drivers and taxi drivers. Only responsible people should be allowed to conduct tourist tours, and thus it may be an idea for taxi drivers and coach drivers to have a tour licence that is independent of their taxi or coach licence. This can be suspended temporarily or permanently if they or their clients are caught feeding the macaques. This would force them not only to stop feeding the animals, but also to discourage their clients from doing so. There should generally be slighter fines for these offences (since fines that are too expensive run the risk of not being enforced), and there should be wardens within the Upper Rock Nature Reserve who are empowered to hand these out. If penalties were enforced once or twice, then this behaviour would cease. Furthermore, the German example (at Wild Park, Daun, Germany) shows that people are quite happy to observe the macaques without feeding them."

"It would be desirable to depopulate the Nature Reserve gradually. This can be approached in different ways. For example, residents can only pass houses on to their offspring, or if the houses are to be sold then the park could have the right of first refusal."

"The native invasive plant *Acanthus mollis* is a problem. It may be an idea to investigate why it isn't as common in nearby Spain as it is here. The answer may lie with some disease or herbivore (insects to mammals) that is not found in Gibraltar. One idea may be to introduce large grazers such as ungulates into the Upper Rock Nature Reserve. Ibex may stick mainly to cliffs, and could even pose a threat to local endemic plants that grow mainly or exclusively on cliffs. One idea could be to introduce Barbary sheep, as these are severely endangered within their native range. Thus, this could also be an exercise of 'ex situ' conservation as well as habitat management. It may also be an idea to look at archaeological records of Gibraltar to determine which ungulates were originally present here (North African roe deer? This is a maquis species). An effort could also be made to re-establish some of the native woodland. There may be some way of finding out what tree species were originally here from archaeological or historical records, or it may be an idea to examine the woodland of nearby limestone mountains."

"Pedestrian use of the Nature Reserve should be encouraged, and a more extensive trail system might be a way to go about this. This could include circle walk paths, and a good map of the Upper Rock trail system could be made and handed out free at the gate with the admission fees."

¹ There was only one shower when the Leeds group visited due to problems with the plumbing, but this has now been resolved and there are now two working showers (20/09/2004)

An improved system of paths would also facilitate student projects. But then again, encouraging dispersal of people may spread human impact that at present is concentrated mainly around tourist traps. If some roads are closed other than to licensed individuals, then this would lessen the general impact of humans on the whole Nature Reserve.”

17.4.2 The Role of GONHS

Although GONHS has been very successful in attracting Barbary macaque researchers and students, little effort has so far gone into establishing Bruce’s Farm Field Centre as a place at which field courses regularly take place. This is unfortunate, given that the location is of such obvious value to universities. It must be said that the field centre at Bruce’s Farm has not received enough promotion around universities, and in this sense GONHS would do well to adopt a new strategy of promotion and advertisement, focusing on universities in the UK, which are the institutes that are most likely to visit. This could include posters, leaflets, etc., as well as more formal approaches. It is interesting to note that field courses to Mediterranean countries are popular amongst British universities, with many of them running courses in southern Spain. Given this fact, a lot more could be done to attract field courses in Gibraltar.

On the other hand, GONHS has been very successful in attracting visitors to their Jews’ Gate Field Centre, where bird-ringing activities take place. Although accommodation facilities are limited there has been a steady flow of ringers and birdwatchers mainly from the United Kingdom, but also from Germany, Sweden, the Netherlands and France. This has placed Gibraltar firmly on the map as a destination where ornithologists can observe and ring interesting birds and as a base from where to visit neighbouring areas in Spain (see 17.5).

17.4.3 Local Schools

Field trips to the Upper Rock by local schools do not occur as frequently as they should (in fact, they hardly ever occur at all). In particular, comprehensive schools carrying out GCSE or A-level field courses could make better use of the Nature Reserve and Bruce’s Farm Centre, rather than visiting nearby Spain every time that there is a field course to be held (although the current state of the Nature Reserve makes this understandable). However, it was encouraging to see in 2003, that the Ministry for the Environment and Health and the Ministry for Education and Culture jointly launched a series of environmental education modules for primary and secondary schools entitled ‘Action – Research for Sustainable Development’. This programme includes a module on ‘Conservation in Gibraltar and the Surrounding Area’, which will include one or more field visits within Gibraltar, and examples on conservation management include the firebreaks on the Upper Rock and the setting up of nature reserves such as the Upper Rock Nature Reserve (which it would be useful to explain to students that whilst designated a nature reserve, the Upper Rock is certainly not managed as one). It has long been our opinion that schools do not do enough to promote and educate on local conservation, and this has therefore been a very positive step. It must be said that although better than in the past decades, there is a particular ignorance amongst Gibraltarians and other local residents regarding conservation and general environmental matters, and young students are the best people to target and make aware of these issues. It is after all from amongst these young people that the conservationists and environmentalists of the future are most likely to emerge.

Finally, since local schools regularly visit nature reserves and natural areas in Spain as part of their curriculum (such as the ‘Parque Natural Los Alcornocales’ or dune systems on the Costa del la Luz), it may be an idea to encourage schools in nearby Spain (particularly those within municipalities that are most cooperative with Gibraltar, such as Los Barrios) to hold field trips to the Upper Rock Nature Reserve, particularly since it offers features that cannot be seen in nearby Spain. These include the Rock’s geology, its flora (which largely results from the Rock’s basic soils) and of course the Barbary macaques. However, if this were to occur, then it would be important to clean up the Nature Reserve of both its litter and its graffiti if the impression that the Upper Rock makes on visiting schools is to be a good one.

17.5 Bird Ringing

Sporadic bird ringing studies were first carried out in Gibraltar by visiting MOD personnel during the 1940s and early 1970s. Members of the Gibraltar Ornithological Society also started ringing during the 1970s. GONHS has been running an intensive bird-ringing programme, based mainly at the Jews’ Gate Field Centre since 1991. This basically consists of catching birds (mainly small passerines), putting a small, very light ring around their leg, recording biometric data and then releasing the bird. In this way, if a bird is re-trapped, it is possible to find out where the bird came from, how much it weighed, etc.

Two licences are required in order to ring birds in Gibraltar. The first, obtained from the British Trust for Ornithology (BTO), is the actually ringing licence that ensures that those who ring are competent in both handling birds and collecting data. The second licence is granted by the Deputy Governor under the ‘Nature Protection Ordinance, 1991’ (L/N 11 of 1991),

and this grants holders of a ringing licence permission to trap and ring birds in Gibraltar for scientific or conservation purposes.

17.6 Macaques

As explained more fully in the Chapter 14, research into our macaques takes place on a regular and continuous basis. This is carried out largely by foreign universities and institutes, such as the University of Zurich, the Chicago Field Museum, the German Primate Centre, the University of Vienna and Notre Dame University in Indiana, as well as other individual researchers. In addition, GONHS carries out research of its own, consisting mainly of keeping a database of group sizes, social structures and identity and a record on each individual macaque. In 2003, GONHS contracted a young postgraduate, Mr Brian Gomila, to carry out some behavioural research into the macaques. As a result, Mr Gomila is now undergoing a Masters course (M.Res.) in Primatology that includes further work on Gibraltar's macaques.

The ongoing research on the macaques and of interest in the species was reflected in a very successful conference in the Calpe Series (Calpe 2003) funded by the Government of Gibraltar's Ministry for Heritage. Entitled '*The Barbary Macaque – Comparative and Evolutionary Perspectives*', it attracted most of the prominent macaque researchers in the world. The lectures and workshops were useful too in improving management of the Gibraltar macaque population, as well as in focusing the needs for conserving the species in

a wild state in Morocco. Overall, it was extremely positive in promoting Gibraltar and scientific work on the Rock. This shows the added value of proper research and management, something that could be extended to other fields in an improved Upper Rock Nature Reserve. Research into the macaques will continue under the Gibraltar Barbary Macaque Programme, which includes work on behaviour, ecology, diseases, and macaque-human interaction. Summaries of some of the ongoing projects are given in Fig. 1.

The Gibraltar Barbary Macaque Project is a collaborative research project of the Gibraltar Ornithological & Natural History Society in association with the German Primate Centre, the Gibraltar Veterinary Clinic, the University of Vienna, Notre Dame University and the Institut Scientifique Rabat.



The aims of the project include the increase in knowledge of the genetics and behaviour of species, of its ecology in Gibraltar so that, among other things, the future management of the Barbary macaques of Gibraltar can be conducted in a way that is consistent with their needs, bearing in mind also the position that they occupy in Gibraltar as a tourist attraction.

Completed, ongoing and planned projects:

Characterization and functional significance of sex skin swelling
Ulrike Moehle: German Primate Centre and Institute of Evolutionary Anthropology, Leipzig.
Completed November 2003
Funding: German Research Council

Population genetics and demography
University of Zurich, PhD project.
Period: till 12.2004
Funding: University of Zurich

Factors determining paternity
German Primate Centre, PhD project.
Period: 04-2003 till 03.2006
Funding: German Research Council

Functional significance of copulation calls
Dana Pfefferle: German Primate Centre and Institute of Evolutionary Anthropology, Leipzig, PhD project
Period: 09.2003 till 08.2006
Funding: German Research Council

Secondary sexual characters and sexual attractivity as determinants of female social status
University of Vienna and German Primate Centre
Period: 07.2003 to 06.2006
Funding: Austrian Research Council

Macaque-human interactions
University of Notre Dame, Indiana, USA
Period: 11.2003 to 01-2004 (pilot phase); 05-2004 to 04.2005 (main phase)
Funding: University Notre Dame

History, Demography and Ecology
Macaque Study Unit
The Gibraltar Ornithological & Natural History Society
Period: ongoing
Funding: GONHS, Gibraltar Trust for Natural History

Figure 1. An overview of the Gibraltar Barbary Macaque project, including current research and main participants.

17.7 Archaeology

There is a wealth of historical heritage on the Upper Rock dating from early man right through the Moorish and Spanish occupations, up to the present time, (see Chapter 7). Recently, excavations at Bray's Cave have revealed an Iron Age burial site together with numerous important artefacts. The potential for further excavations, research and investigation into other caves and historical buildings and structures is great, and will no doubt form part of the ongoing research and development programme of the Gibraltar Museum. It is important, however, that researchers into archaeology are sensitive to the ecology of the caves and adjacent areas.

17.8 Others

In addition to the above, other forms of research take place within the Nature Reserve. Bird monitoring is regularly carried out for example; soaring bird migration and ringing in particular are covered extensively. GONHS is currently carrying out surveys into Gibraltar's biodiversity with the aim of cataloguing the Rock's fauna, flora and fungi. As part of this, the Upper Rock has over the past year been surveyed for its invertebrate fauna, particularly the Lepidoptera (butterflies and moths), Coleoptera (beetles) and Odonata (dragonflies and damselflies). The vascular plants, molluscs, reptiles, amphibians, birds and mammals of the Upper Rock have already been well documented, but much remains to be learnt, and it is the aim of GONHS to try to secure the kind of funding for equipment, books, etc., that will make the research into cataloguing our entire flora, fauna and fungi a realistic aim. There will be clear benefits to the Nature Reserve resulting from all this work.

17.9 The Future...

It is clear that, whereas some aspects of research such as bird ringing and the macaques receive regular attention, others are fairly neglected. The management of the Nature Reserve should take a proactive approach towards encouraging research within the Upper Rock. This is currently not the case. Research on all aspects of the Nature Reserve should be promoted. However, problem areas should receive priority. In this sense, research into such matters as traffic flow, the effect on macaques of visitor numbers and interactions, control and maintenance of macaque populations, monitoring and management of habitats to maximise their value to vulnerable or endangered species and general biodiversity should take priority. Other areas of research, such as archaeology and geographical aspects (e.g., geology, speleology), should also be given special attention due to the importance of Gibraltar for these. Furthermore, the management of the Nature Reserve should make every effort to give publicity to research within the Upper Rock. Thus, for example, panels at some of the macaque sites highlighting the main findings on aspects of macaque behaviour should be erected, with references to the institutions that have been and still are involved in macaque research on the Rock. Similarly, some sort of reference to the Iron Age burial site found at Bray's cave would illustrate to the tourist both the historical importance of the Nature Reserve and the type of work in which the Gibraltar Museum is involved. These, and numerous other examples, would show visitors that serious and useful research is carried out and encouraged on the Upper Rock.

It would be of great benefit to the Upper Rock – and indirectly to Gibraltar - if the Upper Rock Nature Reserve were to gain a reputation as a centre for academic research. If this is to be achieved, the Nature Reserve should be managed in a manner that will facilitate such studies, with some areas specially protected for this purpose. It is recognised that such research may not bring as much money to the Nature Reserve as tourism. However, both can easily be accommodated. Tourism already brings a great deal of money to the Reserve, and there is no need to expand the areas that are exposed to tourists. In addition, the Upper Rock, and Gibraltar in general would gain a reputation as a centre of academic excellence. As such, we would urge that every effort be made to ensure that the Rock Gun and Middle Hill Area be conserved as a special Biological Reserve, carefully managed and accessed, and free of the excessive visitor pressures that affect most other areas of the Upper Rock.

A system whereby grants are awarded by the Ministry for the Environment for projects that are in Gibraltar's interest could certainly be looked into. This would of course require experts within or outside the Ministry (perhaps a panel) in order to determine which are the Nature Reserve's, or more generally Gibraltar's needs before planning a project outline and granting funding to the most successful applicant(s) (who may or may not be from Gibraltar). In addition, the option should be left open for applicants to present their own project proposals, which would then be considered by the panel. Projects on any aspect of the Nature Reserve should be welcomed, and a system should be put in place whereby grants are awarded to an equal proportion of projects covering all subjects. This would fulfil two roles; it would allow Gibraltar to tackle its environmental needs effectively and would give the Government of Gibraltar a reputation of promoting academic excellence.

17.10 Recommendations

1) The establishment of lines of communication and a common forum between research and management bodies. Whereas the work of these two bodies is essential towards the formulation of working protocols they each have differing priorities and objectives. The researcher should work on medium to long-term specific projects achieving hypothetical and academic results. The managers should work towards practical, short-term decision-making processes, based as far as possible on the findings and recommendations of research and monitoring programmes. The basis of a common forum is to provide the scientific committees, i.e., the Nature Conservancy Council, GONHS, and other specific bodies the opportunity to take decisions as part of the fruits of debate involving the managerial sector of the Nature Reserve.

2) Emphasis should be placed on a sound, stable and continual long-term relationship and collaboration between researchers, the Gibraltar Government and the management of the Upper Rock Nature Reserve. This will ensure that the work of scientists and researchers will continue to provide the necessary recommendations to focus on the problems for a rapid assessment and solution to managerial, evaluation and monitoring programmes.

3) The provision of funding for research projects related in particular to the Upper Rock Nature Reserve and the purchase of the equipment and instruments necessary in obtaining, consulting and analysing the data produced by researchers. Research undertaken by foreign students is provisioned by their respective universities. A lot of research carried out by locals has been self-financed or supported wholly or in part by GONHS. GONHS has provided its support to both local and foreign students through the use of reference material from their library, supplying essential scientific equipment and offering sound advice and recommendations. The authorities should meet this financial burden, as the results of research are of benefit not only to the Nature Reserve, but also to Gibraltar's environment as a whole.

4) The establishment of an on-going monitoring programme once the management plan has been instigated, in order to identify, diagnose and address problems that might occur in the near future. It is important to stress that this must be carried out by trained personnel, or persons with experience in their respective fields.

Monitoring is recommended for the following:

- State of monuments, structures, heritage, paths, roads etc.
- Species with unfavourable status, e.g., invasives, vulnerable or threatened, restricted distribution, etc.
- Macaques, e.g., status, population, feeding etc.
- Human impact, e.g., visitor numbers, refuse accumulations, traffic, pollution etc.

5) The promotion of multidisciplinary studies to improve the definition of conservation and management objectives. This should include all thematic areas, i.e., environmental education, recreational use, relationship with the local population, legislation, environmental accounting, arbitration and decision making processes and monitoring and evaluation (EUROPARC-Spain 2002).

Among the principal areas of interest are:

- Landscape ecology.
- Cave geography and ecology.
- Ecosystems management.
- Establishment and use of ecological indicators.
- Establishment and use of socio-economic indicators.
- Disturbance and regeneration cycles.
- Macaque/visitor interactions and macaque population management.
- Repercussions of public use: environmental impact, tourism and services and the effect of visitor numbers.
- Conflict resolutions and managerial processes.
- Relationship of the Nature Reserve with the rest of the territory.

6) The dissemination and publication of the results of research and monitoring programmes, both from a scientific and a managerial aspect. This will result in a better understanding of the values of the Nature Reserve from a public perspective, will serve as a useful tool in environmental education and provide the means for the future development of managerial strategies.

7) The development of environmental educational programmes for schools that will make use of the resources of the Upper Rock, and provide a better understanding of the ecology

and requirements of the Nature Reserve. Schoolchildren should primarily focus on their homeland's environment before embarking on rural and environmental trips to Almoríama, Chiclana, etc. This should serve to support and recognise the wealth of knowledge and facilities that the Upper Rock should provide. Any such programme should be developed by the Department of Education and Training, in conjunction with the management of the Nature Reserve.

8) The establishment of a Biological Reserve in the current (2004) MOD area of Rock Gun and Middle Hill, once this land holding is handed to the Gibraltar Government in April 2005. This is already an area where much research is currently taking place in conjunction with GONHS and its research facility at Bruce's Farm. The site could bring many more people to study a wide variety of subjects, but only if the focus of the study is kept free from interference and interaction by humans.

9) Members of the public should be allowed to appreciate the beauty and tranquillity of the Biological Reserve. However, the sensitivities of this site should be highlighted as a priority in any plans to allow persons within the area. Therefore, authorised guided visits to the Biological Reserve should be limited to small groups, and the frequency with which visits take place should be low. Visits should be led by a warden with ample experience on the natural history of the Upper Rock, who would act as a guide. Visits should ideally be conducted along the roadway, or clearly designated pathways. No interaction with any of the animals of the Biological Reserve should take place, and an appropriate distance should be maintained from these.

10) The Biological Reserve should receive special management, conducted by a scientific body that includes experts on diverse subjects relating to the site. Facilities should be granted to this scientific body to ensure the smooth management of the site. The Biological Reserve should be conditioned to meet the needs of a biological centre. Some of the old buildings at Middle Hill should be provisioned with facilities that provide, encourage and meet the requirements of researchers working in this area. In addition, a fee for visitors can be introduced, the proceeds of which would all go towards the upkeep and management of the Biological Reserve. These funds should not replace, but rather complement money allotted to the Biological Reserve by the management of the Upper Rock Nature Reserve.

11) The Biological Reserve should be managed to the benefit of all wildlife found within this site. Feeding and watering sites for macaques and any introduced herbivores should be installed and properly maintained. In addition, any measures that are deemed beneficial to the wildlife of the Biological Reserve should be put into action. This would be carried out using Biological Reserve funds.

12) Research, monitoring and management should take place throughout the whole of the Nature Reserve. The existence of a Biological Reserve should in no way undermine the importance of the whole of the Upper Rock Nature Reserve to natural history and heritage. Environmentally sound management, after carefully considered research and monitoring, should take place within the entire Nature Reserve.

References

- **EUOPARC-Spain (2002)** *Action Plan for the Protected Natural Areas of the Spanish State*. Madrid, Spain: Fundación Fernando González Bernáldez. 168pp.
- **Gibraltar Gazette (1991)** Nature Protection Ordinance, 1991 (L/N 11 of 1991).

18. MOD sites

18. MOD sites

The Upper Rock was once totally controlled by the military, where they installed numerous batteries and searchlight emplacements that operated during WWII. The area was fenced off by what was popularly known as the 'unclimbable fence'. This area became a total exclusion zone to the resident population, but soon after the war the area was again opened to the public but only during daylight hours. The Upper Rock was controlled by the 'Security Police', (now the Gibraltar Services Police), and firebreak and vegetation maintenance on the lower slopes and Upper Rock was carried out by the MOD. However, most of this was eventually handed over to the Government of Gibraltar. Consequently, four main sites within the Nature Reserve remain under the control of the MOD. These are Rock Gun and Middle Hill, The aerial farm and firebreak above Bruce's Farm, Ince's Farm and Spyglass. The map in Fig. 1 shows existing MOD sites within the Nature Reserve.



Figure 1. Map of Gibraltar. MOD sites (as at 2003) are shaded green. Those that fall within the Upper Rock Nature Reserve are highlighted. Map provided by the MOD.

It is important to point out that Gibraltar nature conservation legislation, including the 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993), equally applies to these sites.

The handover, according to recent information from MOD sources, consisted of everything that remained on this land, including all military installations. Although this was said in reference to disused pipelines, the same logic would dictate that all other military installations, including guns and batteries, would fall under the administration of the Government of Gibraltar. The authors of this report therefore cannot comprehend why the 9.2" guns at Levant and Spur Batteries were removed by the MOD after the handover, given that these were on Government of Gibraltar land. It would be interesting to find out what happened to these guns. If they were sold, then who kept the money? If on the other hand the removal of these guns by the MOD was legitimate, then they should likewise remove all other redundant former MOD installations,

disused pipelines and cables that mar the aesthetic value of the Nature Reserve.

Some of the MOD sites within the Nature Reserve are of considerable importance to the fauna, and in particular the flora of Gibraltar. The firebreaks and aerial farm above Bruce's Farm and the old Rock Gun water catchment hold breeding Barbary partridge *Alectoris barbara*, as well as populations of rabbits *Oryctolagus cuniculus*, and other animals that rely on open areas. Similarly, plants that favour open areas grow well on the firebreaks, and the area above Bruce's Farm is in fact the most important of all firebreaks on the Upper Rock in terms of floral diversity (see Chapter 11).

Some of the 'special' plants of Gibraltar find their strongholds within MOD sites. The Gibraltar champion *Silene tomentosa*, which is endemic to the Rock, was rediscovered at Rock Gun in 1994, having last been seen nearby nine years earlier. It is possible therefore, that apart from a few plants that have been cultivated at the Alameda Botanic Gardens and reintroduced elsewhere, the only wild *Silene tomentosa* in the world may still be found with-

in MOD land. Similarly, the endemic Gibraltar chickweed *Cerastium gibraltarium*, grows very well at both Spyglass and Rock Gun.

The conservation management of all MOD sites in Gibraltar, including those on the Upper Rock, is covered extensively in Bensusan & Perez (2003). Here, we will give a brief account of what conservation measures are required on MOD sites within the Upper Rock Nature Reserve, based on our previous report. Costings are not included, as these have already been provided in Bensusan & Perez (2003), and are in any case for the attention of the MOD and not the Government of Gibraltar.

18.1 Rock Gun and Middle Hill

Rock Gun and Middle Hill constitute what is by far the largest MOD site within the Nature Reserve. It is situated at the northernmost end of the Rock and is extremely important for a variety of flora and fauna, particularly species of open and rocky areas. Important populations of some of the special plants of Gibraltar occur in this area, particularly on the cooler, north-facing ledges and cliffs. *Silene tomentosa* our most endangered special plant, was rediscovered at this site in 1994 (having last been seen in 1985 in this same area), and very small, wild population probably still occurs here.

This area that served as a water catchment was once frequently cleared, but the practice ceased once the catchment became redundant. The vegetation still remains more open in this area than in most parts of the Nature Reserve, and is thus an important breeding site for Barbary partridge *Alectoris barbara*, and wintering site for birds such as black redstarts



Phoenicurus ochruros, and alpine accentors *Prunella collaris*. Plants of open areas, especially those that favour rocky areas, also find strongholds on this slope. However, clearing of this area ceased many years ago, and vegetation now covers the slope to such an extent that the area may soon be covered by the dense maquis that is typical of the Upper Rock if nothing is done to prevent this. Fig. 2 shows how the vegetation on the Rock Gun water catchment has developed over recent years.

Figure 2. The photo shows the Rock Gun catchment during the 1980s, whilst the photo below shows this same area in 2003. As can be seen, the vegetation is rapidly growing denser (taken from Bensusan & Perez 2003).

The development of maquis on these slopes is detrimental to the maintenance of the biodiversity of the Nature Reserve. Given the importance of this area for both flora and fauna, every effort should be made to clear this slope. Once cleared, the low vegetation could be maintained with the introduction of large grazers such as Spanish ibex *Capra pyrenaica* or Barbary sheep *Ammotragus lervia*. Sources from which to obtain these animals have already been identified by GONHS, and individuals are readily available. Furthermore, perhaps some sponsorship could be sought to reduce the cost of introduction (or reintroduction, in the case of the ibex). There is no doubt that, apart from maintaining vegetation low, large grazers, easily visible from roads and paths, would add to the aesthetic appeal of the Upper Rock Nature Reserve. However, a herd of feral goats is presently found at this site, having been introduced illegally several years ago. These would have to be eliminated prior to the introduction of wild ungulates to avoid competition and interbreeding.

Barbary macaques are also resident in this part of the Nature Reserve. Until the summer of 2003, Middle Hill and Rock Gun held the largest (and most thoroughly researched) pack of macaques in Gibraltar. However, of the 65 individuals that were found at this site before this period, 27 were culled after the whole pack took to descending to Catalan Bay on an almost daily basis (see Chapter 14, section 14.5). In order to ensure the continued well-being of the macaques at this site, it is necessary to provide proper tiled and roofed feeding areas and a watering site (e.g., a pond) in order to improve conditions for the macaques and maintain the feeding site clean.

The Rock Gun area is of special importance to wildlife. This, at least in part, is due to the isolation of this site from visitors. Although at present access is restricted due to the presence of the MOD, this may no longer be the case when the MOD eventually hand the site (or most of the site) over to the Government of Gibraltar. (An announcement was made in mid April 2004, that this site would become the property of the Gibraltar Government in April 2005).

It is important to stress that an increase in visitor numbers would be very detrimental to the wildlife of this site, including the endemic, near-endemic and endangered plants and animals that exist at Rock Gun and Middle Hill. With this in mind, it is recommended that, should a hand-over take place, this area should be designated a 'Biological Reserve', with access restricted to researchers and administrators. Furthermore, wardens of the reserve (should these be employed) could lead guided tours of the site to small groups of a limited size. These tours would be particularly attractive if ibex or Barbary sheep are introduced at this site, and if the wardens leading these tours have a good knowledge of the flora and fauna of the Nature Reserve.

A recent development since this report was being compiled is the proposed Funicular Project. This funicular railway would run from Grand Battery at Casemates, up through the lower Rock, through a proposed tunnel 230m in length coming out at the bottom of the road leading up to the Upper Galleries, as seen in Fig. 1. It would then cut directly through the open area of former catchment to a top terminal station to the south of the summit at Rock Gun. This proposal is in conflict with the environmental importance of the area and incompatible with the proposals for the Biological Reserve stipulated in this document.



Figure 3. Proposed Funicular route from Casemates to Rock Gun.

The contractors have presented a 'Technical Feasibility Report No.2' (P. Glassey 2003), where they have tried to integrate the trackway into the landscape, by lowering the rails to the ground wherever possible and diminishing the visual impact of the line through afforestation. Even in a photograph of the view of Rock Gun from the city, they have doctored the picture to include more vegetation around the proposed line, as seen in Fig. 4. This is in totally against the recommendations put by the authors of this report for the clearing of the vegetation of this area in an effort to restore the habitat for the survival of important species of flora and fauna in the Nature Reserve.

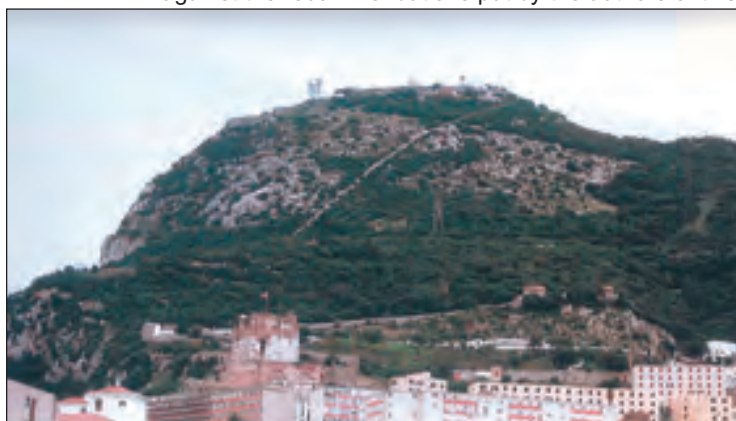


Figure 4. Proposed Funicular route from Casemates to Rock Gun.

18.2 Aerial Farm and Firebreaks

Firebreaks are extremely important to the maintenance of floral diversity within the Nature Reserve. About 213 species of vascular plants (some 37% of Gibraltar's flora) have been recorded on the firebreaks (Linares 1994). Those that occur within MOD land, and in particular the firebreak above Bruce's Farm, are of most importance to the flora of the Nature Reserve. It is important to stress here that, although the status of the Bruce's Farm firebreak seems ambiguous to most people we have spoken to (both Government of Gibraltar employees and MOD staff), this area clearly falls within MOD land. This is clearly shown on the map in Fig. 1, which was provided to us by the MOD. The clearing of these firebreaks is discussed in both Bensusan & Perez (2003) and in Chapter 8 of this report.

18.3 Spyglass

Spyglass, situated at the southernmost peak of the Rock (just north of O'Hara's battery) is a small area that is controlled by the MOD. In spite of its small size, this site contains populations of some of the special plants of Gibraltar, most notably the endemic *Cerastium gibraltarium*, a plant whose population within Spyglass is of national, and therefore international (given that this species is found only in Gibraltar) importance. It is therefore very important that the sensitivity of the flora of this area be taken into account when works are being carried out.

An area on the cliffs below and to the east of Spyglass that is only accessible from this site, known as Monkey's Alameda, has recently been explored and found to contain a large stand of sweet bay or laurel *Laurus nobilis*, (J.P. Latin, *pers. obs.*; Bensusan & Perez 2003). The sensitivity of the flora of this site should also be considered, and further investigations into the flora and fauna of this isolated site may yield some interesting results.

18.4 Ince's Farm Residential Area

The Ince's Farm residential area is divided into two main areas; one of these is the Girl Guide camp and the other was until recently the home of the American Liaison Officer, who earlier this year was moved down to North Front due to security implications. While not of such outstanding importance to the wildlife of the Nature Reserve as some of the other MOD sites, it is certainly no less so than any other section of the Upper Rock. In past years there have been records of nesting Barbary partridges within the garden areas which are fairly open in nature. Moreover, all laws contained within the 'Nature Protection Ordinance, 1991' (L/N 11 OF 1991) and the 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993) apply to this area. Furthermore, this area has a less steep gradient than that of most of the Upper Rock, and so would be a good area to replant with Mediterranean woodland tree species, should a regeneration programme take place. Indeed, olive trees *Olea europea*, are taller in this area than in most other areas of the Nature Reserve, and typical herbaceous woodland species such as the Italian arum *Arum italicum*, do particularly well here. Ince's Farm is also one of the problem areas highlighted in Chapter 8, which deals with invasive flora, and all of the recommendations made in this chapter should be applied to this site.

References

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19. Parque Natural Breña y Marismas de Barbate: A Case Study

19. Parque Natural Breña y Marismas de Barbate: A Case Study



The Pinewood at Parque Natural Breña. Notice the wooden boundary fence.

One of the objectives we contemplated would give us a better understanding of the requirements of the Upper Rock Nature Reserve was to visit a nature reserve of similar size to ours. This should have similar urbanisation pressures, economic activities within the reserve and an ample tourism and visitor base, which would enable us to compare the type of management structure required to manage the same and provide us with a background in the way other reserves cater for their needs.

With these aims in mind we found that the 'Parque Natural Breña y Marismas del Barbate' suited our needs. Although this park encompasses an area of marismas which has no comparison to the Upper Rock, the town of Barbate is sandwiched between this and the 'Parque Natural Breña' that is composed of an extensive pinewood forest, and compares favourably in size and structure to the Upper Rock Nature Reserve.



Rio Barbate

19.1 The Breña Reserve





- Zone A.** Maximum protection for its cultural and ecological value.
-  **Zone B.** Medium protection. Economic and commercial interests permitted.
-  **Zone C.** Still protected but minimal vigilance and full access to the public.
-  **Terrestrial Zone**
-  **Maritime Zone**



Figure 1. Map of the ‘Parque Natural Breña y Marismas de Barbate’ (Taken from Junta de Andalucía (1994)).

The ‘Parque Natural Breña y Marismas de Barbate’ is situated mid-way between the towns of Tarifa and Cádiz, and just south of the town of Vejer. It forms part of the very ridge upon which Vejer is located and runs in a north-south direction down to the town of Barbate. The reserve is composed of a large pinewood bordered to the south by impressive sandstone cliffs, which rise up from the Atlantic to a height of 50m. These cliffs were famous for its breeding colony of herons from the 1960 to 1990s when little egrets *Egretta garzetta*, and cattle egrets *Bubulcus ibis*, that had been displaced by the draining of the immense lagoon of La Janda, found suitable nesting sites on the ledges along the cliff (Francisco Bravo, *pers. comm.*). Most of the herons have now left and have been replaced by yellow-legged gulls *Larus michahellis*, and western jackdaws *Corvus monedula*, with some pairs of rock dove *Columba livia*. These cliffs afford magnificent views of coastline to the east where Barbate is situated and to the west where one can contemplate Cape Trafalgar, steeped in the history of the famous naval battle which bears its name, and the ‘Caños de Meca’, a small urbanisation, progeny of the camp-site which is situated there. The park is bordered on the eastern side by the road that runs from the crossroads near Vejer to Barbate and is dissected by another road that runs from Barbate to Caños de Meca at Cape Trafalgar. From these two roads numerous sandy tracks run into the park that can only be traversed on four by four vehicles or on foot.



Caños de Meca with Cape Trafalgar, as seen from the Breña reserve.

19.2 Flora and Fauna

The 'Parque Natural Breña' is situated on a large ridge of sandstone, which is covered in a vast plantation of pine trees. This is composed mainly of stone pine *Pinus pinea*, with some Aleppo pines *Pinus halepensis*, and just a few maritime pines *Pinus pinaster*. There is a small belt of *Eucalyptus* trees of many different species that were planted in the Franco era to assess the precise species that was best suited to the habitat in order to establish plantations. This stand of *Eucalyptus* is now an important asset to the park. The underlying vegetation is controlled to a large extent to prevent fires from raging out of control. However, large areas are allowed to flourish with bushes of the prickly juniper *Juniperus oxycedrus*, and Phoenician juniper *Juniperus phoenicata*, strawberry tree *Arbutus unedo*, *Osyris quadripartita*, numerous broom species and a large variety of wild flowers that colour the understory surrounding the pine trees.



The pinewood habitat that dominates the Breña reserve.

The proximity of the reserve to the western entrance of the Strait of Gibraltar provides the area with a notable influx of migrant birds in spring and autumn. Nest boxes are provided in many areas of the pinewoods and a variety of passerines take these up. There is also nesting booted eagles *Hieraaetus pennatus*, long-eared owl *Asio otus*, and Eagle owl *Bubo bubo*. Pinewoods are a favourite habitat of the red-necked nightjar *Caprimulgus ruficollis*, and this area is no exception with a good population of this species. The cliffs provide a good vantage point to observe seabird passage and the ledges serve as an ideal nesting habitat for the few species mentioned previously.

The waters surrounding the Parque Breña also form part of the protected area and therefore constitute a marine reserve, and are afforded the same protection as the terrestrial reserve itself.

19.3 General Management

Reserves in Spain have a very complex management structure that mainly works quite well, but this has no comparison to the management structure of the Upper Rock Nature Reserve. Notwithstanding, it is useful to understand the way in which the reserves are managed in Spain, as it could perhaps form the basis on which to constitute a similar structure in Gibraltar.

The 'Parque Natural de Breña y Marismas de Barbate' comes under the authority of the 'Delegación Provincial de Medio Ambiente'. This is an official Government body of the 'Junta de Andalucía' namely its Environment Department, which is headed by a specific Regional minister. The autonomous region has its own office in Sevilla, and in turn this is further divided by provinces. The Delegación Provincial de Medio Ambiente de Cádiz deals with many problems of an environmental nature and carries responsibility for the numerous protected areas that it has at its disposal. These are divided into three separate degrees of importance.

- Reserva Natural: Areas nominated as such are fully protected and public access is totally restricted. Authorisation to those areas is only granted for scientific purposes.
- Parque Natural: These areas are fully protected but access is open to the general public. Economic and commercial interests within the park are permitted.
- Paraje Natural: Full protection is still afforded but with minimal vigilance and with full access to the public.

The Cádiz office employs a Director in charge of all the protected areas of the three types mentioned above. He is Francisco Bravo and we were very grateful to have him at our disposal throughout the tour of the reserve. His knowledge and experience in the management and day to day running of this reserve was extremely useful to us. Sr. Jose Manuel López, who is his technical advisor, accompanied him. He also holds the office of Director of the Parque Jardín Botánico San Fernando, and also heads the Bald Ibis project (a proposed re-introduction of this endangered species into the Parque Natural de Breña from captive stock held in Jerez Zoo.). His knowledge of the area and the historical background together with his vast experience of plantlife was particularly beneficial providing comparisons with the biodiversity of this area and Gibraltar.

Each one of the network of reserves has a Board of Directors (Junta Rectora), which is constituted to advise on all interests within the reserves and parks. It is formed of members of the public who have a vested interest in the running of the affairs of the park, be it economical, social or environmental.

Policing of the reserves and parks is carried out by a contingent of Guarda Forestales, (wardens), who do not come under the authority of the Delegación de Medio Ambiente. They have under their responsibilities very large areas as far away as La Janda and Paterna and including this reserve. They work in co-ordination with the needs of the Delegación de Medio Ambiente and report back on all aspects of the reserve including areas which may need maintenance, tree cutting, visitor co-ordination, fire break maintenance, control of pest species and act as fire lookouts during high risk periods. In this respect they are in touch with the forest fire control agency in Spain, 'INFOCA'. They also liaise with the 'SEPRONA', the environmental liaison officers of the Guardia Civil, on infringements of local wildlife laws. We were fortunate to have as our driver and guide the top warden, 'Jefe de Guardas Forestales', Sr. Juan Sanchez. He was to our mind a charismatic person with profound knowledge of wildlife, for he had spent most of his life in the role of warden in many areas of Spain, as far away as Segovia, down through Jaén, and has now returned back to his homeland at Barbate. He spoke of the area as if it was his own; then again it was, for the passion with which he described the plants, trees and scenery of this wonderful area created a sense of admiration within us, but also brought to us the realisation of the failings within our own Upper Rock Nature Reserve.

Furthermore the Delegación Provincial de Medio Ambiente formed the company EGMASA sa, (Sociedad anonima). This limited company was supposed to accelerate the bureaucracy that slowed down the endeavours of the Agencia de Medio Ambiente (Environmental Agency), the precursor of the Delegación Provincial. It was meant to co-ordinate and manage the economic interests held within the Parques Naturales. It is administered by many ex-officio government officials and political candidates who are not elected in municipal elections and has since also acquired the rights to all works within the areas held by the Delegación, even those going out to tender. It has been found to be in breach of the European Directive in contravention of unfair competition procedures, and will be undergoing a complete restructuring after sanctions were brought against them.

19.4 Environmental Management

There is a certain amount of environmental management that takes place within the reserve on an annual basis. This consists mainly of trimming of young pine trees, removal of trees around denser areas to allow for expansion of the canopy of stone pines *Pinus pinea*, and the maintenance of the undergrowth around the woodland and the upkeep of firebreaks. This work is done in keeping with the economic interests of the pinewoods following recommendations from the Guarda Forestal who surveys the condition of the reserve. With this in mind the Delegación de Medio Ambiente retains a small herd of cattle in this reserve that is allowed to graze around areas that are in need of vegetation maintenance. This is a good, environmentally friendly way of managing the vegetation and should be considered in Gibraltar, perhaps with 'wild' species such as the Spanish ibex *Capra pyrenaica*, or Barbary sheep *Ammotragus lervia* (see Chapter 13, section 13.1).

Firebreaks are a common sight within the Barbate pinewoods. They form an intricate network needed to prevent the spread of fires. These are constantly maintained with a small

workforce with tractors and heavy plant that removes most of the vegetation. An observation tower is situated in the middle of the reserve, which serves as a vantage point from which the Guarda Forestal maintains a watchful eye for fires during the high-risk period from the end of May until the end of September.

19.5 Economic Interests

The most valuable asset the Parque Natural Breña has is its immense pine woodland. This is mainly made up of the species 'stone' or 'umbrella pine', *Pinus pinea* that provides a valuable natural resource, namely the 'piñon' or pine nut. The average annual harvest of pine cones is usually about 1500kg and in a good year can reach as much as 2000kg. The thinning and cutting of trees also provides firewood, which is sold locally, and some heads of cattle from the local herd of the reserve are also sold annually to the local market. Profits made from these resources are re-invested back within the reserve.

19.6 Visitor Provisions

The Parque Natural Breña has several areas designated as picnic sites. These are always within easy reach of the main road and provide fresh water, seating fashioned out of the excess wood in the area and suitably located fireplaces. The area provided is located under large, mature pines that provide the visitor with adequate shade and the vegetation around the picnic site is kept to a minimum to prevent any fires. There are suitable parking facilities and the picnic site is bordered by fencing made of pine logs thereby maintaining an aesthetic environmental appeal and preventing the encroachment of vehicles. Obviously these picnic sites are mainly used in the months of low fire risk periods. During the high risk periods no fires are allowed within any reserve in the area and access is sometimes limited and controlled at entry points where a record of your car's number plate is taken by the Guarda Forestal at the point of entry.

We noticed many foreign visitors taking a pleasant walk around the woods and the cliff area, and were surprised to encounter a party of schoolchildren enjoying a ramble along one of the glades in the pinewoods, as shown in Fig. 2. Having seen this activity we asked the Director Francisco Bravo if there was extensive literature and pamphlets with maps describing the reserve, and if they had established a centre that would provide information about the reserve and describe the interesting commercial activities taking place within it. Unfortunately he told us that none of these were available and it was the only and most important factor that was missing from what we found to be a well-managed and administered reserve.



Figure 2. A party of schoolchildren enjoying an educational walk through the Breña reserve.

19.7 Urbanisation Pressures

The 'Parque Natural Breña y Marismas de Barbate' is made up of two separate areas with the town of Barbate sandwiched between the two. The town's main economic activity has always been fishing with a large fleet, which operates in the Moroccan banks and two separate tuna fishing traps that run from the shoreline to a distance of a mile and interrupts the migration of these large fish. They are penned into a holding net and are then sold to Japanese fishing boats for enormous sums of money. The Moroccan authorities have now rescinded permits to fish in their waters and the tuna catches are decreasing annually. This has meant a decrease in the growth of the town with many of the younger inhabitants leaving to find a better future elsewhere. This has taken some of the pressures of encroachment on the reserves away for the time being, although there are plans to build an educational facility within the eastern borders of the reserve. The Director told us that even though this was going ahead, the land would remain within the administration and management of the Delegación de Medio Ambiente. With this exception the growth of the town has taken place along the narrow margin that borders the two reserves, but growth is slow at the moment, although the tendency of the municipality is to invest in tourism as the alternative.

This is not the case at the western end of the area where the Caños de Meca, which was a small hamlet with a campsite, is now growing at a very fast pace with many buildings being erected without the necessary municipal building permits. Encroachment at both these places is difficult since the terrain rises steeply up to the ridge where the reserve is situated. Yet the reserve boundary starts at the base so there is the danger of not only illegal buildings being built but also the problem of invasive species, pests and fires affecting the well being of the reserve. The problems are very similar to what we find in Gibraltar, but so far we have the Lower Slopes as our buffer zone. How long will they last and how will it affect the Upper Rock Nature Reserve if and when this area disappears?

19.8 Comparisons

With the designation of the Upper Rock Nature Reserve in 1993 (L/N 51 of 1993), no formal management structure was implemented to address the problems and complexities of the area. The Gibraltar Ornithological & Natural History Society (GONHS) has acted in its capacity as the consultative body, at no expense to the Government, in providing advice and suggestions on matters concerning natural history and the environment. This advice has been heeded in some cases and not in others, but the problem lies in that there is no formal body where all matters can be discussed and dealt with expeditiously. In the same way as the Breña reserve, the Upper Rock Nature Reserve should have an advisory Board made up of members of the community with vested interests in all the affairs that concern the area. These should deal with the economic, environmental, cultural and historical aspects of the reserve to ensure a viable and adequate management solution.

The Upper Rock Nature Reserve has no restrictions for public access except for entry after 22:00hrs. There is only one type of Reserve designation in comparison to the three in Spain, and the only areas out of bounds are within the MOD properties of Rock Gun, Middle Hill aerial farm and Spyglass. As and when these areas are handed to the Gibraltar Government, GONHS suggests that in the same way Spain holds on to Reserva Natural for scientific research purposes, these areas that are now used by GONHS for those same purposes should be retained as restricted areas for the public (see Chapter 17). This would enable the ongoing research on the Middle Hill group of Macaques to continue protected from public and touristic interaction, and would provide the ideal area for the introduction of either the Spanish ibex *Capra pyrenaica*, or the Barbary sheep *Ammotragus lervia*, which would then be used, as foraging animals, to control firebreaks and areas of dense vegetation and would enhance the attractiveness of the Reserve (see also Chapter 13). This would be Gibraltar's equivalent to the herd of cattle used in Spanish reserves.

The Breña Reserve has a team of Guardas Forestales that constantly inspects the conditions of the reserve and administers some of the lesser tasks that take place within the area. Gibraltar's Upper Rock has *no one*. GONHS employs a supervisor specifically for the macaques, who is assisted by a team of two people that feed and water the Macaques. Another four persons use the Nature Reserve as part of the control area for the gull cull effort. These people have a good environmental background and are particularly concerned with the condition of the Upper Rock Nature Reserve, yet it is not within their remit to undertake warden duties, nor do they have the time to neglect their responsibilities, nevertheless GONHS does get plenty of feedback from these keen and concerned workers who spend most of the day appreciating nature on the Reserve and seeing the degradation that is taking place. The implementation of wardens as stipulated in the 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993) is paramount if the Upper Rock Nature Reserve is to have a future.

Economic interests within nature reserves are always most welcome as this takes the pressure away from the cost of maintaining a reserve in an adequate condition. In the United Kingdom most reserves charge a small fee on entry that is usually re-invested in the upkeep of the area. In the Breña Reserve entry is free of charge but economic activity generated within the Reserve together with an adequate management structure ensures a good turnover that is also re-invested into the Reserve. In Gibraltar the economic activity generates so much money that, I am sure, we are the envy of most Nature Reserves or National Parks in the world! Yet what percentage is re-invested back into the Nature Reserve? Very little.

Apart from contracting 'Master Services' for the cleaning of the roadways, the occasional maintenance of the Tourist sites, and the sporadic clearing of some of the firebreaks, little else has been done to the rest of the appearance of the Upper Rock Nature Reserve. This basically constitutes a cosmetic facelift for the benefit of the tourists, but our Upper Rock is a sick patient in need of antibiotics and not just an aspirin. At the very least a large percentage of the entry fees should return to the Reserve in the way of maintenance and repairs to all the different aspects of the Reserve, be it environmental, historical or just aesthetic appearances.

The economic activity generated has a bearing on the visitor pressure the Upper Rock Nature Reserve has to endure, and the amount of traffic this generates. The Breña Reserve in comparison has few visitors so there is not much erosion of the sand tracks in the area and litter is easier to control. In Gibraltar, the majority of visitors are taken into the reserve on tour buses or taxis and thereby stick to a specified route. The sites are frequently congested and the traffic on the roads is extremely heavy, making it impassable with blockages lasting a long time. Pollution from the diesel engines makes walking unhealthy and coats the vegetation in the proximity with soot. The Upper Rock Nature Reserve has reached saturation point in view of the amount of vehicles being allowed up the Rock, including the extra ten coach licenses granted recently.

Urbanisation pressures are very similar to the Breña Reserve. Barbate has a thin strip of land with which to expand whereas the possibility of land reclamation from the sea is impossible due to the deep coastal waters and the Atlantic breakers that pound the coastline. In



Gibraltar the possibility of further land reclamation is viable within the harbour area, whilst still allowing the use of the port facilities. Therefore the pressure from urbanisation on the lower slopes should be minimal because the expense of building on the lower slopes and providing a roadway to communicate with the buildings would be greater than the previous option and building costs on level ground are more economical than on a slope. Residential areas within the Upper Rock should be closely monitored to ensure that extensions to buildings are not carried out without planning permission and that there are no new buildings. Government should relocate those residents who live in Government houses to other areas within the Government estate.

The cliffs at Barbate.

References

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- **Junta de Andalucía (1994)** *Plan de Ordenación de los Recursos Naturales del Parque Natural de La Breña y Marismas del Barbate*. Anexo 1. Spain. Junta de Andalucía.

A man in a detailed 18th-century military uniform, including a bicorne hat, a blue coat with red lapels and cuffs, and a white waistcoat, is holding a large wooden scroll. He is standing in a museum or historical site, with several long wooden poles and metal spheres (possibly cannonballs) visible in the background. The scene is dimly lit, with a warm, historical atmosphere.

20. Tourist Sites

20. Tourist Sites

The tourist sites are an integral part of the Upper Rock Nature Reserve that serves to bring large numbers of visitors to Gibraltar. It requires a reliable infrastructure in place to ensure that smooth running of that aspect of the Nature Reserve. The human resources involved are employed directly by the Gibraltar Tourist Board, at a cost equivalent to using a substantial amount of the proceeds from the Nature Reserve. To portray a better understanding of the processes the authors have provided a breakdown of the revenue and expenditure involved.

Visitors to the Upper Rock Nature Reserve pay an entrance fee, and the sum of the fees collected in 2002/2003 amounted to about £2.1m, with expenditure on the sites for the same period calculated at £1.2m. The total number of persons in employment dealing directly with the Upper Rock is thirty-eight. This is divided into six administration staff, nine cleaning and maintenance crew (over and above those contracted with Master Services), and twenty-three site officers. Apart from the salaries of the employees, there is also the added cost of the maintenance of firebreaks and other slopes, the Group 5 security arrangements, miscellaneous expenses and a small amount for the maintenance of exhibits (P. Canessa, *pers. comm.*). The Master Services contract falls under the responsibility and budget of the Ministry for the Environment. After taking all this into account there is still a sum left over of approximately £750,000.

A total of £750,000 was invested in the new sound and lighting display for St. Michael's Cave, but apart from the recurrent costs little else has gone into a repairs and maintenance programme for the sites (P. Canessa, *pers. comm.*), and as such there are several aspects that have deteriorated and need attention. In this chapter we highlight some of those deficiencies and propose changes and improvements to some of the sites. Finally, we list a series of recommendations under each site which we feel would drastically improve the situation and provide value for money to the large number of tourists visiting the Upper Rock Nature Reserve.

20.1 Access

How well is the Upper Rock Nature Reserve depicted on signposts on roads leading up to the entrance? In the past these signs were inadequate, due to their small size and scattered location. We have recently seen an improvement, with the first graphic and text signs (as opposed to the old signs) providing directions on arrival to Gibraltar as early as Winston Churchill Avenue. The bottleneck at the Queen's Hotel and the road leading up from Southport Gates have large signs indicating the route to the Nature Reserve, yet it is surprising how many tourists miss this turn and head up towards Prince Edward's Road instead. An additional sign on the left, at the bottom of Europa Road would prevent lost tourists the harrowing experience of negotiating not only the narrow Prince Edwards Road but also Willis's Road with the prospect of oncoming traffic. Some will eventually arrive at the Moorish Castle barrier from where they will only be able to access the City under Siege and the Upper Galleries and of course, the Tower of Homage.

Once on Europa Road a large sign opposite the Casino directs the tourist up Engineer Road where a more comprehensive sign with substantial information is located. Here at the beginning of Engineer Road, especially during the peak months, a security guard will redirect the tourist back down to town and advise them to use public transport. This usually happens between the hours of 10:00hrs and 16:00hrs when the Nature Reserve is saturated with traffic.

Continuing the journey past this point, the tourist arrives at the entrance gates to the Upper Rock Nature Reserve. Here, another sign provides information on entrance fees and opening and closing times. There is no excuse then for the tourist not willing to pay when he arrives at the ticket booth, for this information is made substantially clear. Despite this, many tourist vehicles that are unwilling to pay the entrance fee, reach Jews' Gate, and then have to be redirected down through Lathbury Barracks.

20.2 Jews' Gate

The Nature Reserve's ticket offices are located at Jews' Gate. These were moved here from another location further down Engineer Road, where the problems of redirecting tourists back to Town against the traffic made the siting of the ticket booths unsuitable. Now the booth is located in the middle of the road to access taxis and coaches to the west and tourists and local vehicles to the east. Recently, in mid 2003, a further booth was placed on the side of the road adjacent to the central booth. This has alleviated the cramped conditions that the Tourist Board workers had to endure. An additional booth was transformed from a container and is used as the restroom of the security guard; although this is, at the time of complet-

ing this chapter, not in operation, it continues to be used as the restroom for both the security guard and the Tourist Board workers. This container has been aligned in a northerly-southerly direction and located alongside the roadway leading up from Lathbury Barracks. It has finally been refurbished to conform to the appearance of the original booth. Its large size has taken up valuable parking space, and its orientation hinders the manoeuvrability of large vehicles, especially coaches.



Figure 1. Second ticket booth at Jews' Gate, with bollards protecting the structure.

To prevent damage to the container, several bollards were installed, again reducing parking. These bollards have been the cause of several accidents whereby taxi drivers backing their vehicles have gauged their distance to the container and backed into the bollards. They should be removed and a metal barrier placed on the outer wall of the container visible to taxi drivers parking their vehicles.

For the last few years the roadway down through Lathbury Barracks had been primarily used to redirect tourist vehicles. However, with the disappearance of the security guards at Lathbury Barracks in the last 20 months, it now is also utilised by public service vehicles heading to the Nature Reserve from Europa Point, and increasingly by locals, especially during weekends. The Tourist Board has plans to direct coach traffic up Lathbury Barracks and the taxis up Engineer Road (P. Canessa, *pers. comm.*). That is why they have refurbished the container and relocated it.

The parking area at Jews' Gate is extremely limited and the area is frequently saturated, with taxis and coaches arriving together and frequently stretching all the way down the road. Local vehicles trying to access the vacant parking area close to the viewing point frequently have to wait, causing a traffic jam, until the taxis and coaches move on.



Figure 2. Traffic at Jews' Gate. Bollards protecting booth, forcing cars to park further into the road.

This Jews' Gate area is in need of refurbishment. Better still, a totally new concept is required for this area. The rather cheap and fake-looking fibreglass 'Pillars of Hercules' based on top of the Battery should be replaced with a more suitable structure in keeping with the historical and scenic value of this site. This does not mean that the significance of the Pillars of Hercules is lost, but rather that a better use is made of the area, as this is the first

stop tourists make and so the site should provide a window to the rest of the natural and historical attributes of the Nature Reserve. The possibility of transferring one of the 9.2" guns down to Jews' Gate Battery, (something which has already been proposed in the past), would greatly enhance the area. It would also provide the visitor with the opportunity to see this otherwise inaccessible historical heritage, given that O'Hara's and Lord Airey's Batteries are behind locked gates. The additional shelter provided at this location, away from the levanter cloud, would substantially increase the gun's' life.

There are other aspects of this site that could be developed. Emphasis, together with information, should be given to the historical background and significance of the Jews' Cemetery. The importance of Gibraltar as a bottleneck in the migration route of most western European birds across the Strait could also be exploited. No information plaques are provided at this site apart from those mounted on the Pillars of Hercules, this being accompanied only by a couple of old rundown telescopes that are also located here. These are covered by numerous layers of red paint and seem to be the only maintenance they receive, and the telescopes are hard to swivel and turn. The quality of the optics is extremely poor and their condition is such that they detract from the value of an already rundown site.

A welcome addition at the viewing platform was the location of a water drinking fountain. Tourists frequently used this, especially during the summer months. However, the fountain stopped working in 2002.

The siting of a garage and mechanical workshop, which is situated below this main tourist structure in full view of visitors, is something we have never been able to understand. It is illogical and totally out of character with sound tourism practises. It is also incompatible within a Nature Reserve. There are usually some repairs to vehicles undertaken there in full view of tourists, and the situation gets worse when the mechanic is operating drills and compressors. You can hardly hear yourself speak. There is now ample space at Lathbury Barracks to relocate this facility. The space vacated could be converted to house interpretation facilities.



Figure 3. Jews' Gate viewing point, Pillars of Hercules and Garage and workshop.

As soon as you arrive at Jews' Gate, problems regarding the illegal feeding of macaques are sometimes visible. One macaque frequently visits this site; he is called 'Lonely', and his name reflects his somewhat introverted character. He sometimes eats scraps around the Jews' Gate area, and is also fed by tourists and the security guard. There is no sign here warning that feeding macaques is illegal. Furthermore, security guards should refrain from feeding the macaques, as this sets a bad example. The current management of the Nature Reserve should ensure that security guards are informed that feeding of the macaques is strictly prohibited.

Toilet facilities are available at Jews' Gate. These were refurbished by Community Projects three years ago, yet these facilities are inadequate for three reasons. Firstly, there are no signs pointing out the location of these toilets. Also, they are inadequate due to the number of tourists that descend on Jews' Gate at any one time, with queues sometimes developing. This problem is exacerbated due to the fact that security guards and the Tourist Board's workers have to share these toilets with tourists. It must be very frustrating for employees to have to wait at the end of a long line of tourists in order to use the toilets. The condition of these toilets is also poor, with one lavatory and a line of urinals that suffers daily from a loss of water pressure (water is supplied by MOD), and therefore does not flush as regularly as it should. They are cleaned, or rather hosed down every morning by Master Services, but every effort should be made to improve the sanitary conditions at this site.

20.3 St. Michael's Cave

The tourist is provided with a map of the sites at the ticket office. Nevertheless, some are always confused and turn in towards Mediterranean Road despite a small sign indicating St Michael's Cave on the left of the turn off. A second, very large sign is provided just before arriving at the Queen's Lookout. The sign is perfectly adequate, although some vandalism and graffiti has tainted it for a long time now. In addition, part of the black paint has been peeled back and should be repaired or replaced.



Figure 4. Vandalised sign close to Queen's Lookout.

Once on Cave Branch Road the tourist is back on track, but has to be careful to avoid oncoming traffic and the protection barriers at the top indicating subsidence of the road.



Figure 5. Road subsidence at the top of Cave Branch Road.

If the tourist is lucky he will not have to queue behind a long row of stationary taxis that prefer to line up along the road rather than use the vacant spaces in the car park, despite all efforts by the security guards. Once through this obstacle the security guards will indicate parking facilities, not at the Cave but halfway up Spur Battery Road. This is understandable because the coaches utilise most of the space within the cave car park, but is indicative of the serious saturation problems suffered by the Nature Reserve (see Chapter 21). It is also unsightly because there is a constant two-way traffic flow of cars and coaches immediately in front of the cave entrance. Finally, with a parking space secured the tourist can then proceed down the one hundred or so metres of road to the cave entrance. Here, the site is shoddy compared to the exit of the cave at the cabin. There is a porta-cabin located outside and the ticket office and the Tourist Board's workers park their mopeds and cars on the brow of the hill leading down towards Lower St. Michael's Cave.

There are also numerous cats at this location and at the top of Cave Branch Road, with up to sixteen individuals counted. These animals, and the food provided for them are unsightly. Cats also pose a grave threat to wildlife in the Nature Reserve. As such, these should be removed. Instead, they are being encouraged and regularly fed, a practice inconsistent with the proper function of a Nature Reserve (see Chapter 5).

One or two groups of macaques regularly visit this site and the animals await tourists to alight from the vehicles. These animals are also encouraged in the area and are illegally fed even, as witnessed by the authors, by the security guards themselves. Signs warning visitors not to feed the macaques are not present here. To make matters worse, the authors have seen chickens running around the entrance to the ticket office, obviously in full view of tourists. The introduction of any non-native species to the Upper Rock Nature Reserve is strictly illegal without a licence. The presence of chickens is particularly worrying given that these compete with Barbary partridges *Alectoris barbara*, for food, and that chickens can often be the source of health problems in humans.

The ticket office at St. Michael's Cave has been improved with a suitable covering for tourists queuing in the rain. Numbers of visitors to the cave were once monitored by the Tourist Board (J.C. Finlayson, *pers. comm.*) but this practice has, regrettably, now ceased. A control on the numbers of visitors into the cave should be established, to ensure that the cave does not deteriorate any further. Visitors to the cave are allowed to wander about on their own, but there should also be the option of a guided tour at regular intervals, especially for groups from coaches. The information within the cave is limited and there is ample scope to increase this both at a historical and geological level. The lighting system was refurbished at the cost of approximately one million pounds (P. Canessa, *pers. comm.*) and two light shows are presented at 10:00hrs and 12:00hrs. This places the onus on taxis and coach operators to arrive *en masse* at these times, with the resultant congestion.

On occasions, rats are reported within the cave. This is a natural habitat for these animals, where they look for warmth during the winter months. Unfortunately they sometimes cause damage to the lighting cables and have to be controlled. It only takes the sighting of one or two of these animals, which is then reported to the Tourist Board, for panic bells to ring. The Environmental Agency is then called in and tackles, what it calls 'an infestation', with rat poison. This is totally incompatible with the function of a Nature Reserve, as these poisons are totally indiscriminate and can be ingested by any other animal within the cave. The poisoned rat can also die outside the cave and be consumed by other animals that will also succumb. This practice poses a threat to the cave ecology of St. Michael's and other nearby caves. The very fact that this practice is illegal under the 'Nature Protection Ordinance, 1991' (L/N 11 1991) has not stopped either the Tourist Board nor the Environmental Agency from tackling the problem with poison. This practice must stop forthwith; there are other trapping methods which are not indiscriminate and that will enable the authorities to evaluate the problem and quantify the infestation, with no harm to the environment. With the removal of the cats, macaques and the chicken coop, proper disposition of refuse and macaque-proof bins, half of the battle against the rats would be won.

20.4 Apes' Den

We now retrace our route down Cave Branch Road again and along Queen's Road to the junction that leads down Old Queen's Road, in the direction of the Apes' Den. Before we reach this junction, we find another tourist stop, and this time an unofficial one where many coaches unload their passengers to observe another group of macaques, the Anglian Way group. Here, a small group of macaques was enticed a few years ago by Taxi drivers, presumably to avoid the congestion at the Apes' Den (they were also attracted to the top of Charles V Wall at Prince Phillip's Arch, which is where most taxis now choose to go). This stop, at the lay-by near Hayne's Cave, is mainly utilised by coaches and private tourist vehicles. The advantage of the group at this location is that they do alleviate traffic problems down at the Apes' Den, which does not have sufficient parking space, and once the visitors have seen and taken their photographs, they can then move on along Queen's Road. The site is provided with large (and rather unsightly) signs indicating that feeding the macaques is prohibited. However, the practise continues unabated despite the warnings, and as a result the ground at this site is frequently covered with peanut shells and other food items that have been fed to the monkeys. Large signs and hefty fines are of little use if the legislation is not going to be enforced.

Continuing on from here we arrive at three forks in the road. The sign there is confusing, for tourists believe that if they take the road down towards the Apes' Den they will miss out on the other sites directed down the centre road. The sign should indicate that the Apes' Den route rejoins the other and also leads to the rest of the tourist sites.



Figure 6. The ambiguous sign at the junction of Queen's Road with Old Queen's Road and Charles V Road.

Taking the left turn at the junction, a small sign indicates 'Apes, Monos'. We should try to use the correct terminology and use 'Monkeys', or better still 'Macaques'. This sign is a small one which directs the visitor to the 'Apes' Den', but by now he has probably already seen macaques at Jews' Gate, St. Michael's Cave and at the Haynes Cave lay-by.

Down the hair-raising, steep Old Queen's Road we arrive, if we are lucky not to encounter any traffic, at the Apes' Den. Parking here is scant and can only accommodate three coaches. The rest are forced to disembark their passengers on the hill; there is nowhere else to go. For the tourist caught in this jam in the middle of the summer months it can be quite hot and frustrating. The whole place is in dire need of a restructuring programme. This not only refers to the parking situation. Paint is peeling off all the buildings and structures, and the site shows a characteristic lack of maintenance. A paint job will help, but can only achieve a temporary solution. Again as recommended for St. Michael's Cave, on-site guides to provide information, instruct visitors not to feed the macaques and provide a guided tour of the site would complement the Nature Reserve tourist's experience and eliminate some of the careless interactions with the macaques that sometimes lead to bites inflicted.

One of the buildings at the Apes' Den should be converted into an interpretation centre, where there should be a permanent exhibition on the history of the macaques, together with adequate information and educational material available and on sale on the biology, distribution and welfare of these animals. There should also be ample space to include the sale of souvenirs and other paraphernalia connected primarily with the macaques, and also other related items in connection with the Nature Reserve. This site should also provide the only official tourist macaque-feeding occasion whereby only the shop can sell approved items of food to the tourists for their photo opportunity (see Chapter 14, section 8).

The souvenir vendor located at this site operates a shabby wooden stall from where he sells his wares. The appearance of this does nothing to improve the situation of this site. The area is cleaned by Master Services who hose down the site frequently and a team from this company has been clearing the refuse-strewn cliffs in the area. This last point is a step in the right direction, as the cliff below Apes' Den suffers from very large accumulations of litter. With an official presence at this site, (guides, attendants or interpretation centre manager), the condition, requirements and facilities of this site could be monitored on a regular basis and prevent the deterioration that has taken place.

20.5 Upper Galleries

Moving on from the Apes' Den, we follow the road down towards the junction with Devil's Gap and then proceed to join Queen's Road. Following this for another 300m we come to Princess Caroline's Battery and a sign indicating a turn off towards the Upper Galleries. We follow this and come to a lay-by where we are instructed by a security guard to park our vehicles. Up until mid-2003 taxis were allowed up to the top, but recently the road began to subside and the authorities had to close the road at the bottom of the hill until this was repaired. Many taxis are now not prepared to wait here for their fare to return from the Upper Galleries, as they have no control of them once they emerge from the tunnels and can therefore take quite a long time to return. From here we walk up the hill to the platform by the entrance.



Figure 7. Waiting area for tour operators at the Upper Galleries site.

The subsidence on the roadside has been repaired by Support Services but no consultation was sought for the wall structure, (see Chapter 7, section 7.6). The result is a horrendous stepped wall that is out of place with the surroundings and does not conform to any other wall or structure within the Upper Rock, and therefore looks totally out of place. Furthermore, the road has not been opened since it was discovered that the platform and walls surrounding the site are dangerous and also in need of urgent repairs. One would have thought that all works would have been carried out at the same time, thereby consolidating the work effort and reducing the disruptive effects to tourism.

The ticket office has recently been refurbished with a new covered walkway into the Galleries, the provision of air-conditioning for the workers and the erection of toilet facilities.

A new, extended, semi-circular terrace on a cantilever basis should be constructed to incorporate the views to the north and east over the North Face of the Rock. Part of the terrace should be covered and include the ticket office and toilets. The toilets would flush into septic tanks in the cavity below the terrace to eliminate costly pipelines and related works. This could then be easily emptied on a regular basis.

Once inside the tunnels we come to an area where we can have a photo opportunity in period costume, the brainchild of Mr. and Mrs. Derek and Giselle Duarte. This enterprising venture, 'The Great Siege Tunnels Photo Experience' is a bold move in the development of this site and as such has received the approval and encouragement of the authorities. However, due to the road closure and the length of time it is taking to begin repairs, this enterprise is suffering from a vast reduction in the tourists accessing this site.

The last large refurbishment to this site was undertaken by the old Gibraltar Tourist Office, who developed the use of life-size human models in period costume located around the guns to good effect. This enterprise was most noteworthy and successful and was completed by Sights Management when they took over the management of the Upper Rock. Since then, the models have endured the damp and humid conditions of the tunnels for various years and are in need of refurbishment.

The tourist can only access the tunnel as far as St. George's Hall, since the wooden platform at the opening over the east side of the Rock was fraught with problems, mainly because of the serious issue of rock falls. Access from this tunnel down to the lower level would enable the visitors more scope in this experience and provide them access to Jock's Balcony, after which they could exit via Princess Anne's Battery at the bottom of Princess Caroline's Battery. This location would be an ideal collection point for the fare as there is ample car parking space. Otherwise, the visitors could walk up to the top at Princess Caroline's Battery where they can join their tour vehicles. This would certainly alleviate congestion at the top of the Upper Galleries. Not only this, but it would also extend the tour to include the WWII installations at this site. These have been wonderfully restored but have as-yet not had the benefit of being used for the development of the tourism product. Such a long tour would require the employment of site guides who would rotate on a regular basis throughout the day to accommodate the groups of tourists. This tour could also work very well in reverse and finish at the interpretation centre and viewing platform we propose at the Upper Galleries. More extended combined vehicle/pedestrian tours could incorporate the Lower Galleries and even end down at Grand Casemates Battery, in the process incorporating the Kings and Queen's Lines of the Lower Rock.

20.6 Princess Caroline's Battery

Although not an official tourist site, we have already talked about the possibilities and opportunities available to this and the corresponding batteries further down from this site, under the Upper Galleries development. Princess Caroline's Battery is specifically the battery situated at the extreme north of Queen's Road, at the junction of the road leading up to the Upper Galleries. However, the whole area leading down from here, and incorporating Princess Royal's, Princess Ann's and Princess Amelia's Batteries has been popularly referred to as 'Princess Caroline's Battery'. The Tourist Board refurbished this area in 2002, at a substantial cost. It was equipped with CCTV cameras to prevent vandalism, but it has remained closed to the public since then. Due to lack of monitoring and vigilance, the area has again been open to vandalism despite the cameras. This area should be opened to the public and form part of the official tourist sites, with official presence throughout the daylight hours to ensure security and provide the infrastructure to the tourist product. In addition, a picnic site could be situated in the large, open areas that this site contains (see Chapter 5, sections 7 & 8).

Let us begin with the Princess Caroline's Battery proper. Parking is again extremely limited, with only enough spaces for three vehicles. Coaches park alongside the west viewing area and occasionally cause traffic jams. Any more vehicles than this, and you can rest assured that you will have to endure a long wait in a queue stretching back along Queen's Road, which in summer is not particularly pleasant, especially for the residents of the area.

The viewing platform is the base of another group of macaques that frequently sun themselves at the back of this area. It is also the base of a WWII gun battery, yet there is no information available to the visitor on the significance of this and the other batteries in the area including the old siege gun located close by. A small and useful WWII exhibition was once provided by Sights Management in the vacant rooms available below this battery, but this has unfortunately been closed for many years now. This viewing point is in need of attention. The numerous olive trees surrounding and obstructing the view should be considerably pruned (but not cut down, as this would encourage erosion).

Many of the visitors wanting to see the macaques, wander to the back of the site and are immediately confronted by the view of the dog kennel. This unsightly structure should be removed forthwith and the owners provided, if necessary, with an alternative and appropriate site outside the Upper Rock Nature Reserve. The impact of howling and barking dogs, flocks of pigeons, and chickens running about in the area is totally incompatible with the proper function of a Nature Reserve. To make matters worse, the waste from this compound has often been dumped on an open area across the road from the kennel. This constitutes a health hazard.

It seems incredible that Princess Caroline's Battery and the access road leading down, including the dog kennel and the other military installations there, did not form part of the costly refurbishment to this area. If and when it is eventually opened to tourism, these areas will have to be tackled. Work should, however, start immediately so that the opportunity is not wasted. In addition, the provision of toilet facilities in this area in the form of septic tanks, as explained in the Upper Galleries sub-chapter, should be a priority.

20.7 City Under Siege

From Princess Caroline's Battery we continue down the hill, down Willis's Road, towards the City Under Siege exhibition. Half way down we pass the lime-kiln, an old remnant of Gibraltar's heritage located at this point. There is a unique, elaborate information panel here. Although this is greatly welcomed, the site could do with a more graphic interpretation of the processes involved in the preparation of the lime together with the uses they were put to in those days. This would certainly be appreciated by all visitors who encounter this structure.

At the City Under Siege site, parking is again at a premium. A proposal for solving this site's, and the Moorish Castle's parking problem is to utilise part of the entrance roadway and surface area of the Waterworks entrance as the parking area for the two sites. Visitors to the City Under Siege would be dropped off at the site. After their tour they could then walk, not down the hill, but along a path provided along the disused water catchment area to the car park, whilst the Moorish Castle visitors could access the entrance via a stairway down from the car park, thereby providing safety away from the road.

At the City Under Siege site, we find the Tourist Board employee in a cramped ticket office. This area needs to be developed to provide more room for the workers, whilst at the same time provide an insight to the historical features found within. This will stimulate more visitors to enter. The site needs additional information about the period in which it was built and utilised. This should be provided by the Gibraltar Museum.

The life-size human models in period costume have endured the weather conditions over the years and have been restored recently, but due to the exposed location of some of these the authorities should have replacements at hand, whereby they can send the soiled ones back for restoration. A small amount of habitat management is also required in the area to allow adequate space around the buildings. This should be done by trained personnel or under supervision of a person with an adequate knowledge of the habitats and natural heritage of the Nature Reserve, such as GONHS personnel. A section of the vegetation should be cleared to resemble the vegetation of the Upper Rock immediately after it was denuded. In addition, information and pictures depicting the impoverished vegetation during the Great Siege and describing the conditions endured by the garrison and the people of Gibraltar should be provided. The Heritage and Planning Division should carry out the monitoring of the condition of these buildings and all other historical heritage within the Nature Reserve, with assessments at least bi-annually. The results would be presented to the Management of the Upper Rock Nature Reserve who would then pass on any necessary action to the competent authorities.

20.8 The Moorish Castle

The proposal under the section on the City Under Siege covers the question of car-parking. The parking area, we believe, would have sufficient space to accommodate toilet facilities for both. Here, the proximity to sewerage pipelines eliminates the need for septic tanks.

The Moorish Castle, or to be precise, the Tower of Homage, lies at the very boundary of the Nature Reserve but is included as it parties one of the official sites located on the Upper Rock and has a direct bearing on much of the development and future plans for the Upper Rock Nature Reserve. During 2003, the Tower underwent restoration, which was carried out on behalf of the Gibraltar Museum. The site has been closed to the general public since the 7th April 2003 and will remain closed until works have been completed. The announced move of the Prison to a new location at Lathbury Barracks will release an important part of the Castle which, according to the Museum Director Prof. Finlayson, will open up a huge section of the Moorish Castle with historical connotations through several periods of Gibraltar's history. The prospects of this news should encourage the authorities to sit with the Gibraltar Museum's experts and commence discussions on the way forward in the development of this new venture, which encompasses the whole of the Moorish Castle.

There remains little to say, as the interior will have undergone a tremendous transformation and the prospects for the rest of the Castle is encouraging. There is, on the other hand, a particular facet that remains and this is the external appearance. The area around the tower needs a certain amount of habitat management, otherwise the vegetation will encroach to such an extent as to shield the base of the Tower from view. This should also apply to the Castle walls running all the way down towards Casemates. This area was cleared of all vegetation a number of years ago during 'Operation Steep-slope' by volunteers from various bodies including youth clubs, Scouts and the Heritage Trust, and the walls illuminated. Since then the vegetation has grown back extensively due to absence of maintenance. The walls and the tower do not require any clearing of herbaceous plants, many of which are protected species, for these lend an aesthetic appeal that enable the viewer to appreciate the age of these structures (C. Viagas *pers. comm.*). However, woody plants such as the olive *Olea europea*, or in particular fig tree *Ficus carica*, growing on the walls should be removed immediately since the roots of these shrubs will eventually cause extensive damage to these structures and walls.

20.9 Cable Car Top Station

The Cable Car is one of the means by which tourists access the Upper Rock. Approximately 140,000 visitors used this method in 2003¹, the majority between the months of April and October inclusive. The Middle Station is the drop off point for visitors wanting to see the Apes' Den, and the Top Station is clearly the prime location for the visitors, where they have magnificent views over both sides of the Rock.

The Top Station has evolved throughout the years. Built on an anti-aircraft battery that was manned by the Gibraltar Defence Force, it has a unique historical value. Initially it consisted of the main block incorporating the arrival area and a coffee and shop facility on the top floor. Part of the roof area was utilised as a terrace that overlooked the town centre to the west. Since then, a new cable car was put into service with the capacity to carry more passengers and a new, semi-circular terrace was built to the north of the main building. This provides the visitor with spectacular views of the north area and both sides of the Rock. A restaurant now provides adequate food and drink and the whole building has now received a new coat of green paint, which tends to blend better into the environment than the former bright white.

A pack of macaques, the Prince Phillip's Arch group, is based one hundred metres south from here and is accessed by the visitors to the Top Station. Since the middle of 2003 about fifteen individuals partially split from this group and established themselves on the WWII installations to the

¹ Data provide by the Gibraltar Tourist Board.

south of the Top Station. They now regularly frequent the Station itself and are to be found there on a daily basis. The management of the Cable Car, M.H. Bland, has now provided a feeding and watering area built to design that should be copied in the official sites.

The Gibraltar Government installed a ticket booth immediately outside the station to target tourists entering the Nature Reserve, for they only pay a specific amount for the Cable Car and extra if they want to access the sites. This booth has not been used, as the vendor at the Bottom Station in fact provides tickets for access to the Nature Reserve. With the macaques based at the Top Station, tourists no longer need to pay extra for this privilege. That said, the macaques do cause some disruption on the terraces where they snatch at bags and steal food from tourists having their meal. Signs should be erected to remind tourists not to feed the macaques. It is encouraging to note in this respect that the Cable Car management have taken steps and entrusted one of their employees to controlling human-macaque interaction.

The terraces at the Top Station are equipped with the same old telescopes as found at Jews' Gate. Here again the management should replace these with new, better quality, and value for money scopes. The ones found there are very old with many layers of paint and are very stiff and do not pan and tilt properly.

After consultation with GONHS, the management of the Cable Car Station is preparing some panels that will provide information on the macaques, historical heritage and the fauna and flora of the Upper Rock, especially birds of prey, as this site is used for the observation of the migration throughout the southerly passage period of these birds. Birdwatchers from many countries worldwide come to Gibraltar in the late summer and autumn and are regularly seen spending many hours at the Top Station observing the migration.

The Cable Car Management has also produced palm-held interpretation facilities in the form of a virtual tour with ample information on Gibraltar and the site, a most welcome pioneering step within the Upper Rock, which should be emulated by the Upper Rock Management.

The area to the south of the Top Station is of historical importance. This was the site of the signal station during the 19th Century, and was also converted to an anti-aircraft battery during WWII, remnants of which lie below the foundations of the Top Station and the north terrace. This site, which is visited by the majority of visitors to the Cable Car, is in a derelict state, with part of the wall along the cliff boundary in a state of collapse. It is used by spotters for smuggling operations and their rubbish is strewn everywhere. Master Services clean the roadway to the top, but accumulations of refuse can be seen over the sides of the road, in corners of the military installations and down the cliffs on the east side. This is obviously more apparent in the summer months when the vegetation has dried, as this reveals all the accumulated refuse. This occurs during the time of the year when greater numbers of tourists frequent Gibraltar. There is an opportunity to facilitate this site with all the paraphernalia of the period and equip it with life-size models, a gun and an interpretation centre with ample information on the period together with graphic information panels and educational material. Unfortunately, at the moment one of the buildings is used as a chicken coop, with chickens running all over the place. The smell is terrible, the place is a health hazard and the whole site is an embarrassment to anyone with any pride in trying to portray Gibraltar as a tourist destination.

20.10 Recommendations

Jews' Gate

- 1) Bollards to be replaced with a visible barrier with a view to saving valuable space and preventing accidents.
- 2) Access to the Nature Reserve via Lathbury Barracks must be closed at 22:00hrs on a daily basis and opened again at 07:00hrs in the same way as the main entrance at Engineer Road.
- 3) Complete rethink and restructuring of the Jews' Gate site, with a proposal of the transfer of one of the 9.2" guns to this site. This should include information panels and interpretation centre possibly using the garage space that should be relocated.
- 4) Toilet facilities to be upgraded and if possible relocated.
- 5) Water drinking fountain to be connected to the mains again and water pressure for this and the toilets to be increased.
- 6) Telescopes to be replaced with newer versions with the authorities ensuring regular maintenance and replacement of these on a regular basis.

7) Garage and workshops should be relocated.

St. Michael's Cave

- 1) Priority must be given to the repairs at the top of Cave Branch Road.
- 2) Proper control of taxi queues so as not to block access to the upper roads.
- 3) Resurfacing of the road leading down to New (Lower) St. Michael's Cave to allow space for the parking of the workers' vehicles, and remove them from sight of the entrance to the cave.
- 4) Porta-cabin to be removed and ticket office to be extended to replace the cabin space.
- 5) A programme for the eradication of cats from within the Nature Reserve.
- 6) Consideration should be given for the removal or transfer of the macaque group from this site. Otherwise the installation of notices advising against feeding, and the provision of macaque-proof bins.
- 7) The chicken coop to be removed immediately and the persons responsible advised against the installation of the same again.
- 8) Annual census and control of visitor numbers into the Nature Reserve, St. Michael's Cave, and all other sites.
- 9) The introduction of Tour guides in the Cave, together with improved information panels.
- 10) Rat control to be regularly undertaken within and outside the cave using environmentally friendly methods.

Ape's Den

- 1) Provide an adequate sign at the top of Lower Queen's Road indicating the 'Ape's Den' or preferably a sign saying 'Macaques, Queen's Gate Group'.
- 2) The complete refurbishment of this site that will hereafter include an annual repairs and maintenance programme.
- 3) The provision of an interpretation centre to provide an exhibition on the macaques, together with information and educational material on the same. This building to also accommodate a shop to replace the shabby cart, and provide souvenirs and other material in relation to the Upper Rock Nature Reserve.
- 4) Provide this site as the only point where you can officially feed macaques with authorised food items sold *only* by this shop with instructions to be adhered to forbidding feeding by hand.
- 5) Employ a number of guides/wardens to provide guided tours, monitor feeding, interaction with tourists, and report back to the Board of Management.

Upper Galleries

- 1) Repair the subsidence of the road close to the entrance to the Upper Galleries.²
- 2) Construct a large new terrace and enclosed entrance complex, to incorporate the views to the north and east, part of which will be covered to provide an area for the ticket office, and toilet facilities.
- 3) The toilet facilities to flush to septic tanks beneath the terrace.
- 4) Employ guides/wardens who would conduct tours, monitor aspects of the Upper and Middle Galleries (interior and exterior), and report back to the Board of Management.
- 5) Provide a regular repair and maintenance programme and assess the condition of the displays within the tunnels with a view to replacing when necessary.
- 6) Connect the Upper to the Middle Galleries via a lift or spiral staircase, with a view to extending the touristic opportunity to include Jock's Balcony, terminating at Princess Ann's Battery and include the refurbished area below Princess Caroline's Battery.

City Under Siege

- 1) Parking facilities for the site to transfer down the road to the Waterworks entrance. (see

² Repairs have been carried out but road still closed since the balcony structure is unsafe.

Moorish Castle). Visitors will be dropped off at this point.

- 2) Ticket office should be enlarged to accommodate a rest area.
- 3) Toilet facilities for this site to be located down at the Waterworks area.
- 4) Employment of guides/wardens for this and the Moorish Castle to rotate on a regular basis, and provide tours and relevant information to visitors.
- 5) Replacement life-size models should be available in stock, to substitute those that are sent back for cleaning and repairs.
- 6) Habitat management of the area around the site should take place on an annual basis by suitably trained staff and an area several metres from this site should provide a firebreak.
- 7) A path should be provided along the old catchment area of the waterworks down to the parking facility and entrance to the Moorish Castle. This will provide a safe means for visitors to transfer on foot to the next site.

Moorish Castle

- 1) Parking facilities for this and the City Under Siege site to be constructed within the area of the entrance to the Waterworks.
- 2) A building that will incorporate the ticket office for the Moorish Castle should be sited here and access the Castle via a bridge over the road.
- 3) The building to include toilet facilities and a shop for this and the above site.
- 4) Guides/wardens employed for this and above site.
- 5) Establishment of a programme of habitat management and clearing of vegetation around the Castle walls to be carried out or supervised by trained personnel.

Cable Car Top Station

- 1) Information on the history of the site as a WWII anti aircraft battery together with details of the flora and fauna and especially the birds of prey on suitable large panels should be provided (currently being dealt with).
- 2) Removal or replacement of the telescopes with better quality ones.

South of Cable Car Top Station

- 1) Complete refurbishment of the area in question.



- 2) Development of this area into an open-air exhibition of the WWII installations there, including life-size models and related paraphernalia of that period.

- 3) Immediate clearing of all refuse on the east cliffs and the western slope of this area.

Finally, at the end of the tour the coaches and taxis should provide a leaflet, to be filled in by visitors, in the form of a quality and value for money control poll that would permit the Upper Rock Nature Reserve authorities to gauge the response of visitors to the Nature Reserve and the quality of its products. This feedback would allow the authorities enough response time to address any failings that might occur without their knowledge, and address these issues before any further deterioration occurred.

The Upper Galleries

References

- Gibraltar Gazette (1991) Nature Protection Ordinance, 1991 (L/N 11 of 1991).

21. Transport, Traffic and Tourism

21. Transport, Traffic and Tourism

21.1 Roads

The network of roads on the Upper Rock Nature Reserve is not suited to the large quantity of traffic that has ensued since the opening of the border with Spain. These roads were built by the MOD on some of the existing pathways and tracks that were used during the 18th and 19th Century with the sole objective of communicating with the military installations that can be found there. All the roads are single lane except for Cave Branch Road, which was widened recently in the 1990s, and the northern end of Queen's Road, which is opened to two-lane traffic during the evening for access for residents on the northern end of the Rock.

Until the early 1980's, the Upper Rock roads above St Michael's cave were the responsibility of the MOD and were only used by military vehicles, as well as authorised civilian vehicles with specific interests, e.g., Cable Car management and GBC engineers for maintenance to television and radio transmitters. They were also frequently patrolled by the GSP (Gibraltar Services Police). On the whole, however, these roads were relatively free of traffic and were enjoyed by the general public who partook of tranquil walks, particularly in the weekend winter months, before retiring to the St Michael's Cabin for afternoon tea. This situation changed drastically when responsibility for the upper roads passed to the Gibraltar Government.

The managing company in charge of the reserve at the time, Sights Management Ltd., was under pressure from the Taxi Association to provide them with an alternative area for viewing the macaques, as the one at Ape's Den clashed with the tour buses with the ensuing traffic jams. Despite objections from GONHS, Sights Management, in conjunction with the Gibraltar Tourist Office, opened the upper roads to taxis. The taxi drivers enticed the macaques to the area of Prince Phillip's Arch at the top of Charles V Wall, where the animals established a group, but also to the top of Anglian Way, and therefore had two new groups to access. This decision now in effect opened up all roads on the Upper Rock Nature Reserve to traffic.

Increased density of vehicles, bottlenecks at Jews' Gate and St Michael's Cave and the unavailability of adequate close and safe parking soon prevented the local population from enjoying their walks on the Upper Rock. Tourists accessing the Rock via the Cable Car who walk down to St Michael's Cave are now subjected to a virtual assault course, avoiding oncoming traffic and manoeuvring around the rows of taxis parked at Prince Phillip's Arch.

In an attempt to resolve the problem at St Michael's Cave, the Government at the time (1994) proposed to build a multi-storey car park cantilevered out over the woodland area below St Michael's Cabin, and proposed to co-fund this with European Union funds. GONHS objected to both the Government and the Deputy Governor, on the grounds of the unacceptable effect on the landscape if the Upper Rock, and carried out a traffic survey at the Cave to establish whether there was a need for the car park. This study concluded that the main problem was not the lack of parking, but the fact that only a single line of cars was possible on Cave Branch Road. Widening the road would enable cars to travel back down (and not along the upper roads) and would allow taxis on that stretch to wait for passengers without blocking access. GONHS also recommended that there should be parking provided along Spur Batter Road. This last recommendation was implemented, and Cave Branch Road was widened, also avoiding earlier plans for a new road to access the Cave from the south (see below). While the overall problem was ameliorated for a while, the upper roads remained in use and taxis chose to await passengers on the part of the road nearest the Cave where the road was not widened and therefore traffic jams continued to occur.

Obviously, the roads of the Upper Rock are totally inadequate to accommodate both vehicular traffic and pedestrians, and this applies to all the roads on the Upper Rock. There is no safe way to venture around on the Upper Rock, since no consideration has been given to pedestrian usage. Pavements do not exist and walkers on the roads are subjected to walking along the drainage ditches to avoid traffic. This, together with exhaust emissions from the high density of vehicles (particularly on steep hills), makes a walk on the Upper Rock a somewhat hazardous and unhealthy endeavour. It is quite possibly due to this that most locals now rarely walk around the Upper Rock, and only partake in a weekend vehicle circuit on Gibraltar's roads that includes the Nature Reserve. An alternative would be to use the Upper Rock paths, but Mediterranean Steps is considered dangerous by the Gibraltar Tourist Board (although they will not address the problems that exist) and the rest of the paths are overgrown, strewn with refuse and, in the case of Martin's Path, obstructed by fallen trees and with a regularly broken sewerage pipe.

In the majority of cases, the road surface in the Nature Reserve is tarmac. This surface tends to soften during the summer months from the excessive heat as the hard, aggregate material sinks very slowly to the bottom. This tends to make the surface very slippery, especially in wet conditions. On slopes, the surface has a tendency of running and forming wavelike shapes. In the winter months the tarmac tends to shrink and sometimes crack, allowing rainwater to penetrate and weaken the structure. This has the propensity to eventually break with the continual passage of vehicles over these sections, causing potholes to appear. These potholes are eventually repaired with tarmac. However, it has recently been the case that potholes are marked with painted squares prior to repair. The time lag between identification and repair has sometimes been so long that the authorities have had to resend their men to repaint the squares, as the original paintwork had practically worn away (see Chapter 5).

The Military had obviously identified the problem of road surfaces on hills and therefore applied a different method to tackle the ascent up Queen's Road. In the section of Queen's road between Jews' Gate and the bottom of Cave Branch Road, they removed the tarmac surface and applied a corrugated concrete base to allow for water run off and maximise grip. This venture, which was carried out in the late 1960s, obviously took a long time to apply. However, it had the advantage that this surface did not require short-term maintenance. In fact this section of road has not required attention until recently when some potholes have appeared and been repaired by the highways section, (B. Bagu, *pers. comm.*).

A suggestion was made by us to the Support Services Section to have this type of low maintenance road surface applied on the Upper Rock, but the reply was that it would require the closing down of large sections of the Upper Rock roads for long periods of time while the surface was applied, and in some cases the complete closure of the Nature Reserve. Obviously, residents would be able to access their homes via the Moorish Castle entrance, but the tour operators would be adversely affected, as although the sites could be accessed in a loop via Cave Branch Road up to the Cable Car and back down Signal Station Road, the access up to the Moorish Castle via Willis's Road would not be able to endure the heavy two way traffic of public service vehicles. The other possibility is to effect repairs and road maintenance during the night-time when vehicular traffic has *supposedly* stopped.

Another aspect is the deterioration of roadsides with the degradation and slippage of road edges. This can be seen at the top of Cave Branch Road, where the road has been protected by a series of posts to prevent vehicles approaching too close to the edge and thereby exacerbating the problem. Bright orange plastic netting surrounds this area, highlighting the obstacle as a precaution to drivers but at the same time emphasising the poor condition of the roads of the Nature Reserve to the many tourists arriving at the cave.

The road at the bottom of Signal Station Road is in an even worse state of disrepair. This section is situated upon a retaining wall that is located 6m above an area of water catchment and is beginning to subside. The area has been closed to vehicular traffic since early 2002, and posts and orange plastic netting demarcate the danger zone. The Tourist Board, realising the dangerous situation, notified the Taxi Association and organised an alternative route. They placed 'No Entry' signs at the crossroads leading along Signal Station Road towards Rock Gun to the north, but this was blatantly ignored time and again. Notwithstanding the signs, some taxi drivers incessantly bypassed this dangerous area in an effort to circumvent the alternative route and thereby avoid traffic congestion at the junction with Queen's Road. Eventually, the Tourist Board placed chained, padlocked barriers at either end of this obstruction, but on several occasions the chains and the padlocks were cut, and some taxi drivers took this opportunity to resume this dangerous route. In October 2003, the authors witnessed that a huge boulder had been placed, as a last resort, in the middle of the road at the top of Signal Station Road, to prevent further incursions. This only lasted a few days until the boulder was moved sufficiently to allow vehicles through. Since then the chained padlocked barriers have been restored.

Finally, the top section of the road leading up to the Upper Galleries has also suffered from the problem of slippage. This was repaired at the end of 2003 and a large unsightly wall erected on the side of the road. Since then, the authors have heard that the balcony area, which was in need of repairs, will now have to be replaced since the supporting pillars have become dilapidated. In connection with these works, the Tourist Board has closed the road off for all vehicles, and visitors wishing access must alight at the parking area at the bottom of the road. Obviously, this includes taxis, and many taxi drivers are not prepared to wait for the lengthy period of time it takes their customers to walk to and from the site. Hopefully repairs will be rapid and the site back and running in a short period of time.

Many roads do not have balustrades or railings, and those that do are in need of repairs. Some are composed of metal piping whereas wires hold others. In many places these are broken, rusty or non-existent. In some areas the MOD has made use of the railings to anchor their

communications cables, creating an unsightly roadside. In other areas they have hidden these cables below the road level. This practice is far more acceptable from an aesthetic point of view, and is to be encouraged.

Queen's Road, from Jews' Gate to the Queen's lookout at the bottom of Cave Branch Road, is only demarcated along this section by a series of white 'guide' stones. Although this helps the drivers keep within the road section, especially at night, the road has no protection whatsoever on its western flank, where a precipice of over one hundred metres drops away. Fortunately enough no accident has occurred along this stretch of road, but the necessary safety requirements, in the way of a low strong wall, needs to be constructed before we lament a catastrophe. Similarly, the (roughly) 250m section of Engineer Road leading up to the ticket offices at Jews' Gate lacks any protection for vehicles and pedestrians. It is surprising, given that two accidents have already happened along this stretch in the last few years, that the Tourist Board has not addressed this serious issue. In one case a motorcyclist was knocked over and fell 2m down, with his motorcycle, onto a concrete base that once held a water tank. He sustained serious injuries and was conveyed to hospital. In the other case an elderly tourist also fell at this same place and suffered minor injuries and was also conveyed to hospital (P. Acolina, *pers. comm.*). This area lies adjacent to the ticket office and very often tourists have to walk between the vehicles and the edge of the road to access the viewing point, putting them at risk. The last section of Queen's road at its northern end, nearing Princess Caroline's Battery also has no protection, but in this case the topography of the area does not require immediate action as the sides of the road do not drop off steeply and could just do with a railing or balustrade.

We have now identified several problems with roadsides, so how best to approach these? It seems that Sights Management identified a solution to this, but before it could be applied totally to the Upper Rock their term ended. They procured and placed the black, rustic, wooden-style plastic railing that one can see at the Ape's Den. This has all the appearance of the real thing. This type of railing is certainly more attractive than the metal piping or the wire balustrade that one can see mainly on the upper roads, and it has the advantage that it is weather proof, long lasting and maintenance free. It would be ideal to have all the metal railings replaced by this type wherever possible, as this would enhance the Upper Rock Nature Reserve's image. In areas where a stronger structure needs to be erected, the authors suggest that low strong walls or rectangular solid structures be built. This will blend in with the existing rectangular stone wall structures that can be found lining the roadsides along the middle section of Queen's Road.

Roads and roadsides are frequently cleaned by Master Services, on contract to the Tourist Board. They do a good job. A maintenance team from the Tourist Board also tackle encroaching vegetation, and cut this back from the sides of the road. This is perfectly reasonable except when they tackle the steep inner sides of the road when, in their zealous nature to maintain a spotless image, they denude the vegetation totally, causing erosion and frequent rockfalls that block the gutters and drainage ditches. Removal of encroaching vegetation, including bushes and overhanging branches is certainly what is required, but many of the smaller plants must not be removed. These not only add colour and aesthetic value, but many of the plants that grow in these situations are extremely interesting biologically and in some cases rare, and their roots prevent soil erosion. Even when dry, these plants do not pose a fire risk.



Figure 1. Removal of plants increases soil erosion and leads to rockfalls.

Some of the roads on the Upper Rock operate a two-way traffic system. The Cave Branch Road leading up to St. Michael's Cave was enduring very heavy traffic and causing traffic jams, and a suggestion for the construction of a new road was made in the late 1980s. This would have been extremely expensive and intrusive, and the alternative was to widen the existing road, which only had a few lay-bys where traffic could pass. Some time later, with the added consideration of the thwarted plans to build a multi-storey car park at St Michael's Cave, the works commenced and were mainly carried out at night to avoid the daily traffic density. This proved a useful exercise and the problem was partially solved in a short period of time. Another area where two-lane traffic is in operation is the section of road from the Moorish Castle to the residential areas on the Upper Rock. However, this is only the case after the gate on Engineer Road leading to Jews' Gate is locked, whatever time that may happen to be.

The final area in question is Engineer Road, from the Upper Rock Nature Reserve entrance to the ticket office at Jews' Gate. This section of road endures all traffic arriving at the bottleneck at Jews' Gate, and frequently many tourist cars unwilling to pay the fees are either now normally sent down Lathbury Barracks road or down Engineer Road. Lathbury Barracks is a two-lane road but Engineer Road is single lane and can only accommodate two vehicles in very a few places. Vehicles often have to back uphill to allow oncoming traffic through and not all tourists have that capability. The road is winding and there is one blind corner above Air House that is particularly dangerous, and traffic accidents have taken place there. Although there are signs warning drivers that this section of road is two-way, when negotiating this particular corner there is no opportunity to see what is behind the bend. Drivers heading downhill solely depend on sounding their horn and take a great risk. Bearing in mind that further down this section of road, the road was shored up due to slippage, it would be beneficial if the bend were straightened out, and the road constructed further in, avoiding any further potential slippage. The rock in this area is not limestone, but rather shale and mudstones that could easily be removed and there is ample space between the existing road and the base of the cliff to construct this new section.



Figure 2. Engineer Road bend, looking north.

Same bend looking south.

21.2 Access

Up until the end of 2000 there were two official points of vehicular entry into the Upper Rock Nature Reserve. The main entrance at the southern end of the Rock on Engineer Road, at the back of Mount Alvernia and the northern entrance at Willis's Road, by the Moorish Castle. These two entry points were controlled by the ticket offices at Jews' Gate and Moorish Castle, providing access to visitors to all the sites on the Rock.

Entry times, or rather opening times of the gate to the reserve are at 07:00hrs until it is officially closed at 22:00hrs by the security guard who then proceeds to the northern post at Moorish Castle where he mans the barrier to allow residents and their guests access to their homes. The security guard should check for vehicles as he proceeds north along the Upper Rock and amicably request that they leave the Nature Reserve, for the Nature Protection Ordinance (L/N 1991) states that no persons shall remain within the Nature Reserve after sunset. Obviously he is unable to check every road and this problem is covered in Chapter 3. Unfortunately the security guard does not challenge persons entering via Moorish Castle at night and this exacerbates the problem. In spite of this, the Upper Rock was relatively quiet at night until a third entry point was recently opened.

The entrance via Lathbury Barracks was, until recently, controlled by security guards at

the Lathbury Barracks guardhouse, who would allow public service vehicles through during the day. In the evening the gate beside Jews' Gate giving access to the Upper Rock Nature Reserve was closed until the following morning. Since the construction of the industrial park and other facilities at Lathbury Barracks, the gate is no longer closed in the evenings and access to the Upper Rock Nature Reserve remains uncontrolled, despite the laws that maintain that no one must be allowed or remain within after sunset. The Tourist Board has been informed but nothing has been done despite the continued high cost of security.

This entry point has had such intense usage that a second ticket office/restroom has been adapted from what was once the eyesore container that provided the restroom to the security guard. At least some effort has gone into restoring a semblance of rural appearance to this structure although having said that, it does look like part of a set for a 'Western'. This entry point, as communicated by the Tourist Board (P. Canessa, *pers. comm.*), is intended to take the coach traffic whereas the Engineer Road will carry all smaller vehicles including taxis. At the moment the majority of coaches do enter via Lathbury but all other vehicles including private cars make use of both. The security guard used to send tourist cars, not willing to pay the entry fee, down via Lathbury but now with an increasing amount of traffic, often blocking this hill, congestion often forms at the ticket offices, often for several minutes until he can solve the traffic problem.

There is one other point of access to the Upper Rock, albeit a private one. This is Green Lane, a road that runs behind the Rock Hotel and is leased to the owners of the Hotel. This road is used, on a verbal arrangement, by the emergency services, and in particular the City Fire Brigade, when they need access to the Upper Rock in case of emergency when tackling serious fires (A. Almeida, *pers. comm.*). Under the circumstances this arrangement has proved beneficial and we hope that this compromise continues in the future. The possibility of using this road for evacuation of vehicles in the case of fire or similar catastrophe should be noted by the authorities and should form part of our proposal to set up an 'Upper Rock Fire Disaster Plan'. (see Chapter 11).

21.3 Recommendations

- 1) Immediate reparation of areas of subsidence on Cave Branch Road and Signal Station Road.
- 2) Establishment of an annual road repairs and maintenance programme.
- 3) Straightening of bend on Engineer Road.
- 4) Provision of paved areas along roadways for pedestrians where possible.
- 5) Replacement of, improvement and addition of road signs, site signs, road painted signs and fire hazard signs.
- 6) Cleaning of roadside vegetated areas to be carried out with care and attention to flora. Plants may be cut but not uprooted, to avoid erosion, and overhanging shrubs to be pruned back.

21.4 Tourism

Since the opening of the border in 1982 for pedestrians, and fully in 1985, the number of persons crossing into Gibraltar has increased dramatically, from 2 million to over 7 million in 2002. Obviously this number includes daily crossings of a workforce of Spaniards and Gibraltarians who live in Spain, as well as locals who shop and spend leisure time in Spain. Notwithstanding this, the figures still point to a very sharp increase in the number of tourists visiting the Upper Rock. Most of these are day visitors from the Costa del Sol who arrive on organised tour buses and as part of their package transfer to local tour buses for the Rock tour, which includes the Nature Reserve. Others make use of the Taxi Association's facilities and a considerable number also travel in their own vehicles.

A total of 7,375,112 persons were counted crossing into Gibraltar in 2002. Of these a daily workforce of 2374 registered Spanish workers, (as at 31st December 2002, courtesy of the Ministry of Employment), plus a couple of hundred Gibraltarians living in Spain and working in Gibraltar, and locals shopping and spending leisure time in Spain need to be subtracted from the grand total to be able to have a reasonable idea of the number of tourists arriving at Gibraltar through the land frontier. Table 1 shows annual totals into Gibraltar by land, air and sea since 1970.

The numbers of visitors by air has dropped slightly since the late 1980s. These figures relate largely to Gibraltarian passengers and visitors on transit, with only a few tourists who

occupy hotel beds in Gibraltar. This total is insignificant in relation to that of persons arriving through the land frontier, even when eliminating non-tourists from the equation. Visitors arriving by sea are composed primarily of tourists disembarking from cruise ships and a relatively small number arriving at the yacht marinas. The figures have remained fairly stable in 2001 and 2002 with 117,183 visitors in cruise ships and 17,659 visitors in yachts (Statistics Office 2002). Significantly, the majority of cruise visitors tour Gibraltar as part of a pre-arranged package whereas the remainder are taken on Rock tours by taxis. The number of visitors arriving on cruise ships has substantially increased in the last thirty years (see tables 1 & 2).

Table 1. Visitor arrivals to Gibraltar by land, sea and air from 1970 to 2002.

Year	By Air	By Sea	By Land	Total
1970	47,726	92,943	0	140,669
1971	48,255	83,754	0	132,009
1972	49,109	90,169	0	139,278
1973	57,460	77,140	0	134,600
1974	53,399	86,525	0	139,924
1975	53,958	75,685	0	129,643
1976	44,490	80,729	0	85,219
1977	43,585	77,584	0	121,169
1978	47,066	72,300	0	119,366
1979	54,079	94,369	0	148,448
1980	51,035	102,721	0	153,756
1981	47,528	84,845	0	132,373
1982	46,180	81,063	46,595	173,838
1983	45,565	93,456	643,609	782,630
1984	47,813	80,654	477,571	606,038
1985	73,664	77,952	2,260,039	2,411,655
1986	89,842	83,808	2,634,250	2,807,900
1987	123,287	97,955	2,963,248	3,184,490
1988	156,075	85,539	3,529,005	3,770,619
1989	162,438	78,014	3,743,725	3,984,177
1990	132,468	84,815	4,155,975	4,373,258
1991	92,829	63,655	3,909,741	4,066,225
1992	87,826	92,312	4,096,033	4,276,171
1993	80,449	81,560	4,117,986	4,279,995
1994	70,180	87,857	4,011,370	4,169,407
1995	72,017	102,924	5,329,717	5,504,658
1996	66,219	113,988	6,270,235	6,450,442
1997	73,698	87,043	5,834,434	5,995,175
1998	76,477	111,172	6,516,934	6,704,583
1999	81,922	145,211	5,917,946	6,145,079
2000	85,255	159,097	7,031,221	7,275,573
2001	92,553	145,987	7,048,108	7,286,648
2002	96,439	136,910	7,375,112	7,608,461

Courtesy Gibraltar Government Statistics Office.

Table 2. Visitor arrivals by land 2000-2002.

	Persons			Motor Vehicles			Coaches		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
January	481,212	492,126	505,046	125,119	129,464	132,451	587	666	584
February	507,167	504,911	483,337	125,676	128,190	121,635	850	843	766
March	584,973	571,687	565,678	132,705	142,307	132,610	1,317	1,416	1,197
April	602,004	586,251	620,623	126,991	133,789	145,037	1,483	1,405	1,306
May	589,039	614,651	650,833	130,146	142,418	155,518	1,593	1,569	1,372
June	571,807	554,929	581,788	129,563	128,130	137,351	1,260	1,468	1,074
July	606,867	656,416	668,174	135,571	151,004	157,911	1,176	1,243	938
August	710,620	715,361	763,598	145,934	155,861	158,667	1,205	1,202	948
Septemb.	652,972	621,760	664,206	136,082	137,624	156,104	1,621	1,418	1,316
October	650,227	650,739	700,965	140,196	145,257	161,613	1,730	1,550	1,421
Novemb.	558,418	553,557	593,041	132,898	131,495	146,973	1,170	1,029	867
Decemb.	515,915	525,720	577,823	128,229	129,999	152,590	771	619	618
Total	7,031,221	7,048,108	7,375,112	1,589,110	1,655,538	1,758,460	14,763	14,428	12,407

Courtesy Gibraltar Government Statistics Office.

So what is the potential tourist total that Gibraltar receives annually? Working on the statistics provided by Government up to the end of 2002 and the employment figures, together with visitor arrivals via land, sea and air, we have calculated an estimate for that year. This is shown in Fig. 3 below.

- Total visitors through the land frontier at the end 2002 = 7,375,112. *as per statistics.*

- Total Spanish registered workers = 2374. *as at 31st December 2002.*
- Estimated total Spanish unregistered workers = 200. (*our own estimate*).
- Estimated total Gibraltarians living in Spain and working in Gibraltar
- Minimum = 100 and Maximum = 300
- Total workers minimum = 2474 Total workers maximum = 2874
- Multiplied by 5 weekdays and 48 weeks to allow for four weeks leave:
- $2474 \times 5 \times 48 = 593,760$ minimum workers crossing the land frontier in 2002.
- $2874 \times 5 \times 48 = 689,760$ maximum workers crossing the land frontier in 2002.

Estimated number of Gibraltarians crossing for shopping and leisure per week

- Minimum = 1,500 and Maximum 5,000
- Minimum = 78,000 and Maximum 260,000 *per annum*

Estimated number of Spaniards entering Gibraltar per week for shopping, i.e. petrol, tobacco, sugar etc.

- Minimum = 1,500 and Maximum = 5,000
- Minimum = 78,000 and Maximum 260,000 *per annum*
- Total minimum entry = $593,760 + 78,000 + 78,000 = 749,760$
- Total maximum entry = $689,760 + 260,000 + 260,000 = 1,209,760$
- Total less minimum = $7,375,112 - 749,760 = 6,625,352$
- Total less maximum = $7,375,112 - 1,209,760 = 6,165,352$
- Total maximum plus cruise visitors = $6,625,352 + 116,918 = 6,742,270$
- Total minimum plus cruise visitors = $6,165,352 + 116,918 = 6,282,270$

Adding these two totals to the cruise ship arrivals we arrive at a hypothetical tourist figure for Gibraltar. Visitor numbers arriving by air is minimal and will probably not influence the final calculations. Even when a hypothetical minimum is considered, the final number remains extremely high. Let us inflate the following figures to an unrealistic hypothetical maximum to see what happens:

- Total Spanish registered workers = 2374. *as at 31st December 2002.*
- Total hypothetical unregistered Spanish workers = 1000. *Our own estimate.*
- Estimated total Gibraltarians living in Spain and working in Gibraltar = 1500.
- Multiplied by 5 weekdays and 48 weeks to allow for four weeks leave = $4874 \times 5 \times 48 = 1,169,760$ workers crossing the land frontier in 2002.
- Estimated hypothetical number of Gibraltarians crossing for shopping and leisure: *per week* = 10,000; *per annum* = 520,000
- Estimated hypothetical number of Spaniards entering Gibraltar per week for shopping, i.e. petrol, tobacco, sugar etc: *per week* = 20,000, *per annum* = 1,040,000

- Total hypothetical maximum = 1,169,760 + 520,000 + 1,040,000 = 2,729,760 non-tourists.
- Total hypothetical number of tourist = 7,375,112 – 2,729,760 = 4,645,352
- Add to this the number of visitors from cruise ships = 4,645,352 + 116,918 = 4,762,270

So we arrive at three figures: high maximum = 6,742,270; conservative maximum = 6,282,270; hypothetical minimum = 4,762,270.

Figure 3. Estimates of total number of tourists visiting Gibraltar during 2002.

Fig. 3 demonstrates that even when using inflated figures, the potential catchment for tourists present in Gibraltar, most of whom could visit the Upper Rock Nature Reserve, may approximately stand between 5 million and 7 million. Given the unrealistic or inflated figures used in this last demonstration the final or true figure must lie closer to approximately 5.5 to 6 million tourists mark. Now that we have arrived at the potential number of tourists that can access the Upper Rock Nature Reserve and other tourist sites, what is the true figure?

Table 3. Monthly visitor numbers to the Upper Rock Nature Reserve.

	2000	2001	2002	2003
January		25756	21786	26193
February		32773	33134	32924
March		54038	53363	47289
April	77913	73046	65766	67422
May	86913	85759	77434	75909
June	74412	74242	63225	73027
July	80094	80324	83299	84664
August	92855	82810	104307	90257
September	88636	82738	89456	78834
October	89594	81715	96109	79018
November	48557	43390	42897	38702
December	25642	22376	26009	24680
Total	664616	738967	756785	718919

Data provided by the Government of Gibraltar.

By looking at table 3, we can instantly see that in relation to the estimate given above, a relatively low number of the potential tourist total visits the Upper Rock Nature Reserve. Yet we find that the Nature Reserve and especially the sites are fully saturated with both vehicles and tourists. On the Upper Rock we have found that in many instances several of the sites are at times overflowing with vehicles and tourists at certain times of the day. So how can the saturation levels be alleviated whilst at the same time maintaining visitor numbers at a sustainable level for both the environment and the tourist sites? Although alleviating the situation by reducing the number of visitors would seem difficult to achieve, an alternative would be to increase the quality of the tours, providing more time and a richer interaction with guides. This could include specialist tours such as historical or nature walks. Obviously, the price of these tours would be greater than a normal tour. This would mean that the Management would gain extra revenue *per capita*. If such a programme could be shown to work, then considerations on visitor number control could be made without a loss of income.

Part of the problem is, we suggest, the making of the Tourist Board. The special light show at St. Michael's Cave at 10:00hrs and 12:00hrs in the morning attracts an inordinate amount of taxis and coaches with several hundred tourists specifically at these times. The other problem is that all the tour operators undertake the same route as they pick up their fare from the coach park or the frontier. This means that all sites around Gibraltar receive the same amount of traffic at specific times. To make matters worse, the first vehicle to leave one site is very quickly followed by all the others. They sometimes try to outdo each other to be the first to arrive at the next site, and on occasions, rowdy discussions ensue. If these fares were staggered by sites, i.e., one coach goes to Europa Point first while the next visits the Nature Reserve, and then vice versa, the whole situation could be improved. This is especially true for coaches, as there are very few parking facilities at any of the sites for these large vehicles.

It is plain to see that although the number of tourists accessing the Nature Reserve is

small compared to the potential catchment available, the number already visiting the Upper Rock has reached just about saturation point. This cannot be increased without a detrimental effect on the sites and the environment, something that is already beginning to happen.

In the last decade visitor numbers have increased substantially (see Table 1), and this has seen a rise in the number of tourists visiting the Upper Rock Nature Reserve. However, although the Upper Rock's infrastructure for cleansing, maintenance and site control has improved, it is still not adequate. This has brought about negative consequences, not only for the tourist product and the visitors themselves, but also in the general appearance of the place and the environment as a whole. Basically, these are the consequences of a lack of vision of 'sustainable tourist development' (see Chapter 22) in that we are 'milking the cow dry'! There are responsibilities linked to any business enterprise to ensure that it continues to reap benefits and unfortunately these have been neglected. These responsibilities involve quality of the product, product information, continual maintenance and repairs of sites, paths and heritage, value for money, environmental management, general maintenance and cleaning of all areas and anything else to improve the product. This requires a great deal of investment, not only on the sites and the tourist product but also to the general appearance and well being of the environment of the Nature Reserve as a whole.

To put the Upper Rock into perspective, the ecological impacts of tourism are equally as important as economic concerns. If tourism destroys the resources on which the industry depends, then the activity cannot be considered a conservation tool (Ziffer 1989). The Galapagos National Park, once thought to be a model of conservation through tourism, became an example of how excessive and uncontrolled tourism can cause severe environmental degradation (de Groot 1983). The original management plan for the park called for a maximum of 12,000 visitors. When the demand for the park increased, government officials simply increased the visitor quota to three times the original allotment. Thus tourism has the potential not only to raise incentives for preservation but also to increase incentives for misuse. Even with good intentions, the sheer numbers of visitors can collectively lead to a resource strain.

Although hugely different examples, a comparison between impact to wildlife in the Galapagos and on the Upper Rock can still be made. When we then consider the Upper Rock Nature Reserve, which is a fraction of the surface area of the Galapagos National Park and with an uncontrolled number of over 700,000 visitors a year, plus an estimated annual total of over 60,000 vehicles, we can appreciate the magnitude of the problem. There is a saturation problem, and the best way to address this problem is to increase quality, diversify tours away from the Upper Rock, find an alternative environmentally friendly transport system and increase revenue without increasing visitors.

21.5 Revenue

The Upper Rock Nature Reserve made £1.7m in 2000/2001 and £2.2m in 2002, so we believe that there are sufficient resources to invest substantially both in the tourist product and in the natural environment and heritage, on an annual basis.

Table 4. Nature Reserve revenue and comparisons with visitor, concessionary rate and other.

	2001	2002	2003
<i>Number of Visitors</i>	738967	756785	718919
<i>Actual Revenue</i>	£2,248,571.50	£2,284,478.50	£2,139,850.50
<i>Average per visitor</i>	£3.04	£3.02	£2.98
<i>If all Adults full fare</i>	£5,172,769.00	£5,297,495.00	£5,032,433.00
<i>If all Visitors pay concessionary rate £3</i>	£2,216,901.00	£2,270,355.00	£215,675,700
<i>Difference between concessionary and actual Revenue</i>	-£31,670.50	-£14,123.50	£16,906.50

In table 4, the revenue for 2001 includes revenue for the 100-Ton Gun. The average earnings from this site are approximately £4,000 and are therefore insignificant when considering the Upper Rock in total. The total sum is made up of four core elements. These are given in table 5, together with the amount of visitors and money that each sector contributes.

Table 5. Breakdown of contribution of each of the main four elements to the Nature Reserve.

Vehicle Class	Number of Visitors			Income (£)		
	2001	2002	2003	2001	2002	2003
<i>Coaches</i>	322,161	305,932	287,533	966,483	917,814	862,599
<i>Taxis</i>	171,969	166,536	164,555	515,907	499,608	493,665
<i>Private (Tourist)</i>	83,381	77,937	73,576	610,301	570,383	537,921
<i>Cable Car</i>	155,490	196,621	184,172	260,652	250,398	199,976

Visitors accessing the Upper Rock on Coaches and Taxis are charged at the concessionary rate of £3. Tourists in private or hired vehicles pay £7 (£4 for a child) and £1.50 per vehicle. The authors believe this to be rather expensive, especially when taking into consideration a family party. Visitors via the Cable Car accessing the sites provide £3, with the rest contributing £0.50 as a royalty for using the Upper Rock. Pedestrian tourists wishing to access the sites are asked to pay the full amount (£7 adults and £4 children), which the authors again believe to be on the expensive side. Walking only within the Upper Rock costs £2 and the average total this sector brings per year is only £44,000.

In the last three years the Gibraltar Government has made £6,672,900.50 from the fees at the Nature Reserve entrance, including the Cable Car Upper Rock fees and royalty payments. At the same time the running costs of the Tourism sites re: Government of Gibraltar estimates 2002/03, as at forecast outturn 2001/2002, (Statistics 2002), were divided between running expenses costing approximately £110,000, Gibraltar Development Corporation Staff Services costing £738,000 and Contracted Services, i.e. security services, for £108,000. Since then Master Services have also formed part of the contracted services but, as a consequence, must have had a marked reduction in the wage bill for the GDC staff services. All told, if we take this to be the running costs of the tourist sites as at the present time, then the total annual running costs is £956,000 annually or £2,868,000 from 2001 to 2003 inclusive. Therefore, there is a surplus of approximately £3,804,900.5 in the last three years. This is a considerable amount taking into account that the recurrent costs have been accounted for and that this amount reflects the profit made from just the Upper Rock Nature Reserve in the last three years. This total is sufficient to initiate the management plan with the preliminary necessary works programmes listed and establish the groundwork for the annual recurrent works programmes.

One recommendation that we believe should be taken into consideration is the lowering of the fee for the private adult tourist. At the moment the private adult tourist pays £7. This should be reduced to £6 with the child paying the stipulated £4. Similarly adult tourist walkers visiting sites or the same accessing the Upper Rock on the Cable Car and visiting the sites should also pay £6. To lessen the impact on the total, the concessionary rate should be increased from the current £3 to £4. These changes are relatively small and would not impact greatly on the tour operators since the fees have remained unchanged for some years now, and they would still only be paying a child fare to the Government. This minor change would amount to an increase of approximately £500,000 per year to the total amount and could be justified if the tour operators saw a significant improvement to the Upper Rock Nature Reserve. To put things into perspective table 6 gives the total revenue for the years 2001-2003, and then applies the changes in fees and gives the new totals for comparison.

Table 6. Total revenue if concessionary rate is increased to £4 and adult private tourist reduced to £6.

	2001	2002	2003
<i>Actual revenue</i>	£2,248,571.50	£2,284,478.50	£2,139,850.50
<i>Revenue with concessionary rate increased to £4 and adult private tourist rate down to £6</i>	£2,861,992.00	£2,740,425.00	£2,648,159.50

21.6 Recommendations

1) There is a saturation problem, and the best way to address this problem is to increase quality, diversify tours away from the Upper Rock, find an alternative environmentally friendly transport system and increase revenue without increasing numbers of visitors.

2) Tour operators should diversify into quality, specialised tours, e.g., history, natural history or geology.

3) The Management Board of the Upper Rock Nature Reserve should provide specialised and knowledgeable guides to focus on the specialised tours.

4) Increase concessionary rate to £4 and reduce the private tourist rate to £6, *only* when all the priority recommendations in this report have been applied and the Upper Rock Nature Reserve is in the state where the authorities can then provide quality and value for money.

21.7 Vehicles Survey

In order to gain an indication of the total number of all vehicles entering the Nature Reserve and the main times of entry, the authors embarked on a vehicle survey at the beginning of 2003. The method chosen was to count all vehicles entering the Reserve between the hours of 09:30hrs and 18:00hrs during four separate days each month. Two weekdays, a Tuesday and a Wednesday of another week and a weekend, a Saturday and Sunday of another week were chosen. Vehicles were separated into five classes: locals, tourists, taxis, coaches and motorcycles. Pedestrians were also included at the beginning of the survey, but because the numbers were so insignificant and also difficult to quantify when large numbers of tourists dismounted before arriving at the ticket office, it was decided not to count them further. Some survey days coincided with particularly wet weather, including hail, whereas others were carried out in the intense heat of July and August. Some fell on days when cruise ships arrived in port (see table 6), whilst others were fairly quiet. The following section contains an analysis on a monthly basis, together with a synopsis of the traffic situation throughout the year. All the data collected are presented in electronic format in Appendix 3 (on a CD), together with bar charts that reveal the daily trends of the individual classes of vehicles and a pie chart showing the distribution of the classes of vehicles on a daily basis.

Table 7. Cruise arrivals during the traffic survey out of a total of 168 cruise ships for 2003.

Date	Vessel	Individual Potential Capacity	Total potential capacity during survey	Total potential capacity for the Month
Sat 29 th Mar.	<i>Kristina Regina</i>	245	245	1145
Sat 12 th Apr.	<i>Oriana</i>	1975	4201	6841
Sun 27 th Apr.	<i>Carousel</i>	1012		
Sun 27 th Apr.	<i>Noordam</i>	1214		
Sun 11 th May	<i>Oriana</i>	1975	2506	23133
Wed 28 th May	<i>World Renaissance</i>	531		
Wed 4 th Jun.	<i>World Renaissance</i>	531	3231	11842
Tue 10 th Jun.	<i>Monterey</i>	600		
Sun 22 nd Jun.	<i>Costa Mediterranea</i>	2100		
Wed 16 th Jul.	<i>World Renaissance</i>	531	2506	18356
Tue 22 nd Jul.	<i>Oriana</i>	1975		
Wed 6 th Aug.	<i>World Renaissance</i>	531	1031	12215
Sat 16 th Aug.	<i>Van Gogh</i>	500		
Sun 7 th Sep.	<i>Golden Princess</i>	2600	8222	21935
Sat 13 th Sep.	<i>Funchal</i>	439		
Tue 16 th Sep.	<i>Queen Elizabeth 2</i>	1531		
Wed 24 th Sep.	<i>Oriana</i>	1975		
Wed 24 th Sep.	<i>World Renaissance</i>	531		
Wed 24 th Sep.	<i>Sundream</i>	1146		
Wed 8 th Oct.	<i>World Renaissance</i>	531	5927	30101
Wed 8 th Oct.	<i>Oceana</i>	1950		
Sat 18 th Oct.	<i>Sundream</i>	1146		
Tue 28 th Oct.	<i>C. Columbus</i>	400		
Tue 28 th Oct.	<i>Millenium</i>	1900		
Tue 18 th Nov.	<i>Oosterdam</i>	1848	7460	27331
Tue 18 th Nov.	<i>Maxim Gorkiy</i>	788		
Tue 18 th Nov.	<i>Van Gogh</i>	500		
Sun 23 rd Nov.	<i>Noordam</i>	1214		
Sun 23 rd Nov.	<i>Island Escape</i>	1512		
Sat 29 th Nov.	<i>Van Gogh</i>	500		
Sat 29 th Nov.	<i>Melody</i>	1098		
Sun 7 th Dec.	<i>Costa Tropicale</i>	1022	1022	8731
Total			36351	161630

JANUARY

January is usually a month with few visitors accessing the Upper Rock, but it is also the time of the year when the Cable Car is closed for maintenance. Therefore, those tourists who want to visit the Upper Rock using public transport will avail themselves of taxis, or are already booked on tours by coach tour operators. Although numbers are small for the time of the year, the majority of visitors to the Upper Rock will enter the Reserve via the Jews' Gate entry point.

During weekdays, visitor numbers, although low, were relatively steady with 26 and 33 coaches respectively on the Tuesday and Wednesday and 68 and 82 taxis accessing the Nature Reserve. Coaches, conveying day visitors, were mainly observed during the morning and early afternoon between the hours of 10:00hrs and 13:00hrs, whereas taxis also peaked during the morning but continued with a small trickle of visitors during the afternoon. Private tourist vehicles maintained a steady flow during the whole of the period surveyed. Local vehicles arrived at the Upper Rock throughout the day with an average of 8 vehicles every half hour without any noticeable peak. The trend for motorcycles during weekdays seems to be notable in the mid to late afternoon when youngsters, using this form of transport, tend to ride up the Rock after work or school.

On weekends the pattern changes, with an increase of foreign visitors using their private vehicles and taxis, especially during the Sunday. Coach traffic was significantly lower with only one on the Saturday and 18 on the Sunday. Day-trippers prefer to book tours during weekdays, and weekends are also the departure and arrival times for tourists, hence the notable decrease in this type of visitor. Locals make up the most noticeable increase in traffic. During the winter months, it is customary for many locals to take a ride around Gibraltar after lunchtime when there is a monumental increase in traffic between the hours of 15:00hrs and 18:00hrs. A huge total of 699 vehicles were counted for the Saturday and Sunday, making up 72.5% of the total amount of traffic carried on the Upper Rock Nature Reserve roads. This is a very large number of vehicles on the road with a density which reached, on occasions, one vehicle every 30 seconds, bringing the total for local vehicles on that Sunday to 434. Similarly, the majority of motorcycles are local and therefore access the Upper Rock in a like manner to local cars. Although the Tourist Board carries out a count of vehicles entering the Nature Reserve, it does not take account of local vehicles. The significant totals for this sector have a bearing on road usage, pollution and deterioration of our roads. However, it is significant to note that, although local vehicles often make up the majority of vehicles on the Upper Rock, these peak during a different time of the day to tour operators (see Appendix 3). Therefore, the exclusion of local vehicles would do little to improve the problem of traffic congestion. The difference in pattern of peak times can be observed consistently throughout the year.

FEBRUARY

It is a policy of the Tourist Board that when a cruise ship is in port a prohibition on the flow of private tourist vehicles to the Upper Rock is activated until such time as it is deemed that this category of vehicle will not pose a traffic problem. This was the case on the 12th February when this type of vehicle was not allowed to enter until midday. There were only 26 such vehicles in the remainder of the day. However, 153 private tourist vehicles entered on Tuesday 25th February, significantly higher than on any day in January. The increase in visitor numbers is reflected in the taxi total for the weekdays, with a total of 224 taxis during the two days surveyed. Tour operators utilising coaches employed 26 and 54 vehicles respectively on the Tuesday and Wednesday, a small increase compared to a similar period in January. In contrast, local vehicles and motorcycles were down in numbers.

Weekends reflected the winter trend found in January. Taxi and coach numbers were down in comparison to weekdays, with a total of 99 taxis and 28 coaches; approximately half of those numbers recorded during weekdays. Again, maximum density for both these sectors was recorded during the morning and early afternoon. Private foreign vehicles were making far more use of this period to visit the Upper Rock than on weekdays, and numbers had increased from the January total during the similar period with 73 on Saturday and 110 on Sunday, a small increase on the previous month. Local vehicles and motorcycle numbers dropped, with a total of 413 vehicles and 29 motorcycles for the weekend. Again, as in January, most numbers of vehicles and motorcycles were recorded between the hours of 15:00hrs and 18:00hrs. During the winter weekends, a lot of locals make use of the scant parking area at Jews' Gate to take a walk in the Nature Reserve. Very soon this whole area is filled with parked cars, some blocked in, and access to the observation area by tourists is hampered.

MARCH

Numbers of private tourist vehicles remained consistent during weekdays in comparison

to the last two months. Tuesdays saw a larger number of this type of vehicle than on Wednesdays. The reason for this is not clear, but the trend follows this pattern throughout the year. The reverse is true for taxis and coaches. Taxi numbers were similar to February with 231 vehicles in March in comparison to 224 vehicles in February, yet coach activity increased from 80 in February to 117 in March, possibly reflecting small increases in numbers of tourists entering via the frontier. Local vehicles again were the largest sector of vehicles on the Upper Rock roads with a total of 323 vehicles for the two weekdays surveyed and an average of 8 vehicles every half-hour throughout the two days. Numbers of motorcycles were relatively insignificant with a total of 21 for the two days with the majority recorded in the afternoon.

Activity during the weekend continued along the winter trend with local vehicles making up the bulk, with 130 counted on Saturday and 268 on Sunday following the afternoon drive trend. Numbers were markedly less than in January and slightly less again than February. Motorcycle numbers were again fairly insignificant and so do not show any trend. Taxi numbers for the weekend remained consistent with the previous month, with a total of 105 for the two days. There was a drop in numbers between the hours of 12:30hrs and 13:30hrs which would imply either drivers or their fares going for a lunch break. Coach numbers remained high for the Saturday with 28 vehicles recorded but only 11 on the Sunday. Private tourist vehicles slowly increased in numbers as the spring season arrived with 66 vehicles on the Saturday and 130 on the Sunday. Most of these vehicles accessed the Upper Rock between the hours of 11:00hrs and 16:00hrs demonstrating the allowance made for arrival and departure times to and from Gibraltar.

APRIL

Easter fell in the middle of the month with the main official holiday period between the 18th and 21st inclusive, and obviously visitors to Gibraltar took advantage of this to visit the Upper Rock. Yet as we can see from our results, it appears that a substantial number of tourists spent an extended holiday in Spain and frequently visited the Rock throughout this month.

Private tourist vehicles numbers increased substantially during the weekdays with 153 on the Tuesday and 93 on the Wednesday. The highest density for this type of vehicle during both days was found after midday. This may be due to the long queues on the Spanish side of the frontier, preventing access to Gibraltar until mid morning. Taxi activity also increased this month with 137 vehicles on the Tuesday and 178 on the Wednesday. Taxi numbers were consistent throughout the day with just small fluctuations during mid morning and shortly after midday. Local vehicle numbers remained steady throughout these two days with 139 on Tuesday and 149 on the Wednesday. Motorcycle numbers were relatively low on the Tuesday, but 36 on the Wednesday was the largest weekday total since the beginning of the year.

The spring weather saw a substantial increase in local vehicle usage during the weekends with 241 on the Saturday and 281 on the Sunday. Again, numbers were concentrated during the afternoons with an average of one car a minute. Private tourist vehicles totalled 152 for both days, surprisingly lower than the weekend totals for the previous two months. However, taxis had their largest totals for the year so far with 83 on Saturday and 90 on Sunday. Coaches also reflected this upward trend with their highest totals, with 41 for Saturday and 29 for Sunday. Motorcycles achieved their highest total for the weekend with 76 vehicles, of which 50 were counted on the Sunday (mostly during the afternoon).

MAY

Near the middle of this month private tourist vehicles were banned from the Upper Rock because of repairs to Cave Branch Road and the area of St Michael's Cave. As a result, the survey of Tuesday 20th only produced 6 of this class of vehicle that managed to slip through the controls. By the end of the month traffic was back to normal with 83 private tourist vehicles on the Wednesday. Taxi numbers were down compared to the previous month with 116 on the Tuesday and 147 on Wednesday, but coaches maintained their numbers with a total of 114 vehicles for the two days. Local vehicles reached their highest total for the weekdays with 175 on the Tuesday and 158 on the Wednesday, with an average of 8 vehicles every half-hour throughout the day. Likewise motorcycles totalled 51, achieving their highest total since January.

Local vehicle numbers remained high for the weekends with 128 on Saturday and 251 on Sunday. Flow remained fairly constant during the Saturday with an average of 7 vehicles every half-hour, but this increased (as usual) on the Sunday afternoon to 22 vehicles every half-hour. Motorcycle numbers remained high with a total of 45 for the two days, reflecting the fair weather and warmer climate for the month. This also accounted for good numbers of private tourist vehicles with 78 on Saturday and 98 on Saturday. Taxi numbers were com-

paratively down with 72 on the Saturday and only 41 on Sunday, and the authors overheard one driver comment that this May had been relatively poor in comparison to the same period last year. Coaches on the other hand maintained their numbers and actually had their best Sunday in the year with 35 vehicles.

JUNE

Weekdays during this month again saw local vehicle numbers totalling 264 on both days surveyed, a decrease of 69 for the same period the previous month. The density remained relatively constant throughout both days without any discernible peaks. Surprisingly motorcycles totalled 78 with a large total of 59 counted on the Tuesday. This count was the largest weekday total for the year. The private tourist vehicle weekday trend was finally broken, with 99 vehicles on the Tuesday and 114 on the Wednesday. Numbers for the weekdays were similar to other months, yet taxi numbers had increased this month (after a decrease in May), indicating an increase in the tourist population in Spain as summer approached. Coach tour operations remained relatively stable, with only a slight drop in vehicle numbers, for a total of 96 vehicles for both days.

Significantly, local vehicle numbers decreased substantially as the fair weather signalled the start of the bathing season, and families now frequented the beaches. Vehicle numbers for the weekends had dropped to 95 for Saturday and 98 for Sunday, a result of the summer trend. Both these numbers must include the residents of the Upper Rock and vehicles providing services to the sites and residential areas together with military and official local vehicles. This core element will access the Nature Reserve almost on a daily basis, the rest composed of the usual 'drive around Gibraltar' elements. We only counted a total of 53 motorcycles, divided between 21 on Saturday and 32 on Sunday. Similar numbers of private tourist vehicles were encountered on these two days with 64 and 61, spread throughout the morning and afternoon with relatively little activity around lunchtime. However, taxis had their biggest turnout during the middle of the day with maxima of 8 vehicles in half an hour between 12:30hrs and 15:00hrs on the Saturday and a maximum of 20 vehicles on Sunday between 12:00hrs and 13:00hrs, for a total of 157 for both days. Coaches on Saturday reached 33 vehicles, but Sundays are usually lax for organised tours, consequently they only mustered 16 vehicles up the Rock.

JULY

Local vehicle numbers during the summer weekdays had now established themselves at around the 250 mark for both days. This compared favourably with the previous month, which saw 264 vehicles. This number was spread out evenly throughout the day, with a slight decrease during the lunch period. Motorcycle numbers saw a small decrease. The holiday period was now upon us and this resulted in a substantial increase in tourist numbers. Private tourist vehicles reached similar totals when compared to Easter for both days, with 138 for Tuesday and 106 for Wednesday. Many more tourists used taxis for transport with a total of 356 vehicles for both days and a day record of 204 vehicles on Wednesday 16th. Coaches again maintained their steady numbers for the weekdays with a total of 98 vehicles with a trend developing for the use of these vehicles during the mornings and early afternoons. Despite this, a few coaches were counted much later in the afternoon, possibly as a result of late arrivals of tours at the coach park.

Weekend numbers of local vehicles maintained themselves at a total of 181 vehicles with 92 for Saturday and 89 for Sunday. Likewise, the motorcycle numbers remained low. The weekend figures for taxis did not reflect the high numbers encountered in the middle of the week, with a total of 131 for both days; 26 vehicles less than in the month of June. Coaches fared little better, with only 23 vehicles on the Saturday and 4 on Sunday.

AUGUST

Numbers of local vehicles for weekdays increased throughout this month with a total of 297 vehicles -up 44 on last month- and numbers were evenly distributed throughout the day. Motorcycles on the other hand maintained their numbers with a total of 48 for both days. A total of 172 private tourist vehicles for the two days represented a marked decline in this form of transport accessing the Upper Rock. This can be explained by the ban on tourist vehicles that is in force during the height of the summer until 15:00hrs, after which only 96 vehicles were counted. In contrast, a massive influx of tourists represented record daily totals of taxis for Tuesday with 209 vehicles and Wednesday with 217, with up to 28 taxis in a 30-minute period in the morning. Coaches fared just as well with 52 vehicles on Tuesday and a record 58 on Wednesday, mainly operating throughout the morning and early afternoon.

Weekend numbers of local vehicles were fairly stable with a total of 210 for both days, spread out through the day. Similarly, the pattern for motorcycles had not changed throughout the hot summer period and a total of 67 were counted for both days. A total of 242 pri-

vate tourist vehicles represented the highest weekend total for the year with daily totals of 116 on Saturday and 126 on Sunday. Greatest vehicle density was found throughout the late morning and early afternoon, with a lot of vehicles taking advantage of the cooler late afternoon and entering just as the ticket office closed. Taxis and coaches did well on Saturday with 103 and 37 vehicles respectively, but on Sunday the taxis could only muster tourists for 48 vehicles and coaches did little better with only 7 vehicles to show for their efforts.

SEPTEMBER

Local vehicles continued along their summer trend with a consistent figure for the summer months of 142 vehicles for Tuesday and 133 for Wednesday, distributed fairly evenly throughout the day. There were a total 50 motorcycles for the two days, again consistent with recent monthly weekdays survey totals. Private tourist vehicle numbers decreased substantially with 106 on the Tuesday and only 34 on the Wednesday. This last figure could be as a result of the survey being carried out toward the end of the month by which time tourist numbers are well down. Low numbers were also influenced by wet weather throughout the morning and a total ban of traffic between 16:00hrs and 17:00hrs when a small fire broke out in the vicinity of Apes' Den. Taxi numbers were down on August figures with 150 vehicles on Tuesday and 161 on the Wednesday, but were still within a healthy margin, totalling 311 vehicles, a figure that fell between June and July's weekday totals. Density was distributed fairly evenly throughout the day, but toward the end of the month the majority of vehicles were counted in the morning and early afternoon. Surprisingly, coach figures were extremely high for this month, even surpassing the main holiday period of August. A total of 77 vehicles were recorded on the Tuesday and a record 85 on the Wednesday. This coincided with the arrival of the Queen Elizabeth II, for between 09:30hrs and 10:00hrs on the 16th, 14 vehicles were recorded contributing to the largest influx of visitors recorded within a short space of time, creating traffic jams at the bottlenecks of Jews' Gate and St. Michael's Cave.

Numbers of local vehicles increased to the highest total during the weekend of the summer months to 295, with 133 on Saturday and 162 on Sunday. This reflects the end of the bathing season and more importantly the start of the school term. Motorcycle figures continued the high numbers recorded in August with a total of 65 vehicles but private tourist vehicles dropped to 92 on Saturday and 81 on Sunday demonstrating the end of the holiday season. However the month of September heralded the arrival of 27 cruise ships with a potential of 21,000 passengers, which maintained a healthy tourist trade for both the taxi and coach tour operator. Taxis had their best weekend all year with 92 vehicles on the Saturday and 127 on the Sunday mainly during the morning and early afternoon. Coaches did likewise with 38 vehicles on Saturday and a record 66 on Sunday.

OCTOBER

Local vehicle numbers had begun to establish themselves back to the winter trend with a total of 154 vehicles on Tuesday and 139 on the Wednesday. The density again saw a slight rise in the middle of the afternoon. Motorcycle figures totalled 42 vehicles. Numbers of private tourist vehicles were similar to the previous month with the Tuesday total (98) greater than the Wednesday total (67), maintaining the trend seen during the earlier part of the year. The weekday total for taxis, at 362 vehicles, was an improvement on the previous month, with the Tuesday total of 214 vehicles surpassing that of Wednesday. Coach tours fared just as well, with 44 vehicles on the Tuesday and 88 vehicles on the Wednesday. After 15:00hrs very few coaches were counted.

The winter trend for local vehicles was now establishing itself with 202 on Saturday and 181 on Sunday, with large peaks of vehicles now obvious during the afternoon after 15:00hrs. In contrast, motorcycle numbers were down to 28 and 9 vehicles on the two days. Private tourist vehicles were much in evidence during the weekend with 80 vehicles on the Saturday and a large total of 145 on the Sunday. Tourist numbers were still healthy. This was reflected in the high numbers achieved by taxis, which managed 90 vehicles on the Saturday and only 59 vehicles on Sunday. Again, this was obviously due to cruise ships boosting numbers with a total of 27 ships and a potential capacity of 30,000 passengers for the month. The trend shows peaks in mid-morning on Saturday, correlating with the earlier arrival of the cruise ship Sundream with a potential capacity of 1146 passengers. Coaches reflected this trend with 40 on Saturday but only 13 on the Sunday.

NOVEMBER

By now, local vehicles maintained their autumn/winter numbers on weekdays with a total of 281 vehicles compared to last month's total of 293, the density again showing the characteristic afternoon peak. Likewise, motorcycles numbers reflected the exact same numbers as the previous month with 42 vehicles. Private tourist vehicle numbers were slowly dropping with 77 on the Tuesday and 47 on Wednesday, and this was reflected in tourists conveyed in taxis, which had also decreased substantially to 132 vehicles on Tuesday and 107

on Wednesday. Coach tour operators managed to muster a total of 108 vehicles for the two days. Most of this traffic was concentrated in the mornings.

Weekend local vehicle traffic remained similar to the previous month with a total of 386 vehicles compared to the total of 383 the previous month, again concentrated in the afternoons. However, motorcycle numbers were well down. Numbers of private tourist vehicles were much the same as the weekday total with only 119 counted. Similarly, figures for taxis for the weekend were much the same as the previous month with a total of 158 vehicles reflecting the customary figure of this sector during the autumn and winter months. This pattern was reflected in coach numbers with a comparable total to last month of 50 vehicles for the two days.

DECEMBER

The survey for this month included three of the days during the Christmas holiday period; namely Tuesday 23rd, Saturday 27th and the last day of the year, Wednesday the 31st. The authors expected a low turn out during this period, but the results were surprising. On the Tuesday the authors counted 169 local vehicles. This was a little above that days' total for the last few months, but on the Wednesday 208 local vehicles were recorded with the majority counted during the afternoon, when employers released their workers and granted the afternoon off. Coincidentally the weather on that day was marvellous for the time of the year and the locals took the opportunity for a ride around Gibraltar, producing a similar result as on Sundays. Motorcycles also had their best on Wednesday with 37 vehicles up the Rock. Likewise, private tourist vehicle numbers were average on Tuesday with 98 vehicles, but on the Wednesday 141 vehicles decided to visit the Upper Rock. The improved dry weather on the 31st also benefited the tour operators with taxi numbers up from November to a total of 198 for the two days. Likewise coach numbers did well on Wednesday with 40 vehicles but only managed 19 vehicles on the Tuesday.

The figures for local vehicles on Saturday totalled 171, but on Sunday a record number of vehicles were counted with 307, mainly during the afternoon reaching an incredible rate of 43 per half hour between 15:30hrs and 16:30 hrs. Tourist capacity during December must have increased, producing totals of 121 and 131 vehicles on both days surveyed, and taxi numbers for the Saturday were up from the last three months to 105 vehicles, and a respectable 92 on the Sunday. The coach tour operators did not fare as well with only a total of 27 vehicles for the two days, of which only two accessed the Nature Reserve on Sunday.

*

The summary above reflects the monthly trends throughout the year, but as can be appreciated in the summary, there are striking differences between the weekday and weekend traffic. To establish a clearer picture of the movements of all sectors of vehicles throughout the year, estimated monthly weekend & weekday means have been used to plot graphs (Figs. 4 & 5) that show the density of each sector of vehicle.

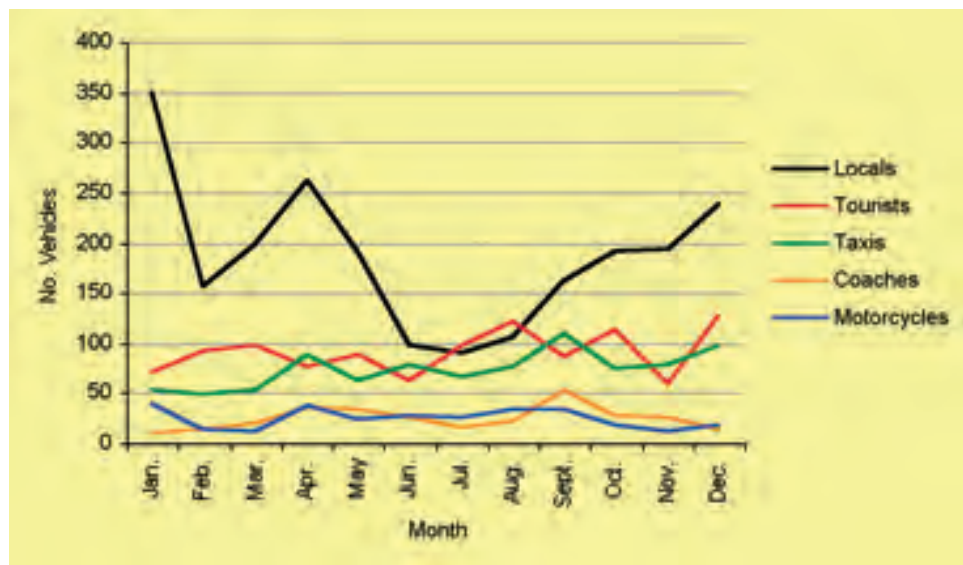


Figure 4. Estimated weekend mean for all months, for all sectors of vehicles surveyed in 2003.

Local vehicles are by far the most dominant sector on the Upper Rock during weekends. The largest figures are found during the winter months, after which a steady decrease is noted with a marked increase during the Easter period. Between mid May and mid September numbers drop considerably as the local population spends more leisure time at the beaches, avoiding the hot Upper Rock roads. Towards the end of September the winter trend resumes as can be seen in the graph, as the locals make more recreational use of the Nature Reserve, if only for a drive.

Private tourist vehicles and taxis are the next most frequent sectors but they almost never reach the numbers of local vehicles, except for private tourists during the summer months (especially the peak holiday season between the end of July and August, when locals are at an all time low). Even then numbers rarely exceed 150 vehicles for both categories.

Weekends are particularly slow for coaches, as most cruise ship arrivals take place during weekdays, and weekends are the time for arrivals and departures of the tourist element in the Costa del Sol. Therefore there is little activity in the way of organised tours to Gibraltar during this period of the week. Even then it is interesting to note the similarity in the peaks and troughs that this sector shares with taxis. This shows the year-through fluctuations in tourism at Gibraltar, especially in Easter and late summer. Motorcycle numbers are extremely low, only displaying a slight increase during the Easter period.

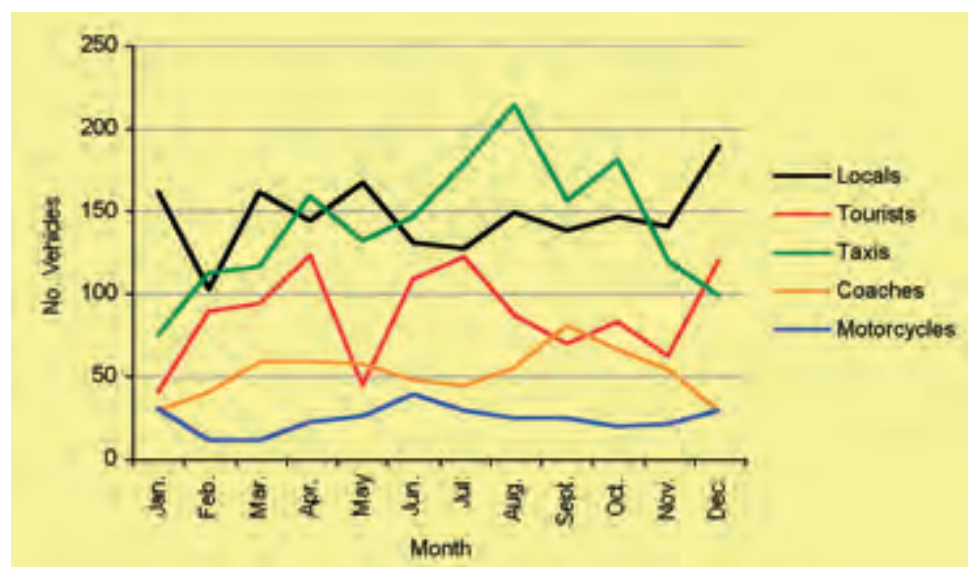


Figure 5. Estimated weekday mean for all months, for all sectors of vehicles surveyed in 2003.

Fig. 5 displays the estimated weekday mean for each month. Here, there is a noticeable difference in the vehicle densities observed in the estimated weekend mean. The two sectors that dominate the density of vehicles throughout the year are local vehicles and taxis. Local vehicles do not show a trend and numbers fluctuate irregularly, with only a slight decrease during the summer months and increases throughout December and January. This contrasts sharply with the taxis, which show very evident peaks. These are attributable to the increase of tourism to the Rock, with peaks at Easter, the summer months and early autumn when the arrival of cruise ships increased trade. Private tourist vehicles reflect the fluctuations of the taxis and mirrors the increases in the density of the arrival of tourists to Gibraltar. Coaches show a similar pattern. Although numbers never reach the high figures of the other three sectors, coaches convey more visitors. Again, motorcycle numbers are extremely low.

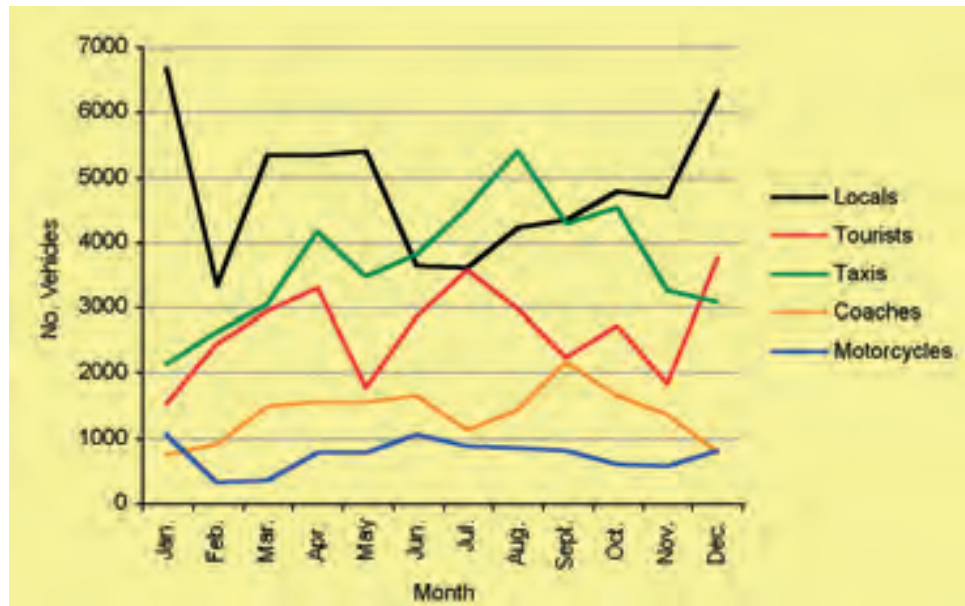


Figure 6. Estimated monthly totals for all vehicles entering the Upper Rock Nature Reserve during 2003.

In Fig. 6, estimated monthly totals have been calculated for the year. The largest elements here are local cars, which peak at over 6000 per month during the winter. This sector is only surpassed during the summer months by the taxis. Coaches reflect the same trend as taxis and tourist vehicles, with more visitors using this mode of transport than the other two. From the point of view of impact, although coach numbers are less than half that of taxis, they probably pollute as much as several taxis together. Thankfully, daily local vehicle density and the rest of the other sectors do not usually coincide. The majority of the taxis, coaches, and private tourist vehicles arrive at the Nature Reserve during the morning and early afternoon, whereas the largest densities of local vehicles and motorcycles are registered during mid to late afternoons.

Obviously, the weekday and weekend mean and estimated monthly totals are based on just one weekend and two weekdays in the month. In order to quantify this error margin, the authors have calculated the 'standard deviation' for each figure given. Tables 3, 4 and 5 at the end of Appendix 3 contains all the data available that were used to plot the graphs in Figs. 4 to 7 and includes the weekday and weekend mean and weekday and weekend standard deviation, and also the daily mean, estimated monthly and annual total and monthly and annual standard deviation of each sector of vehicle surveyed.

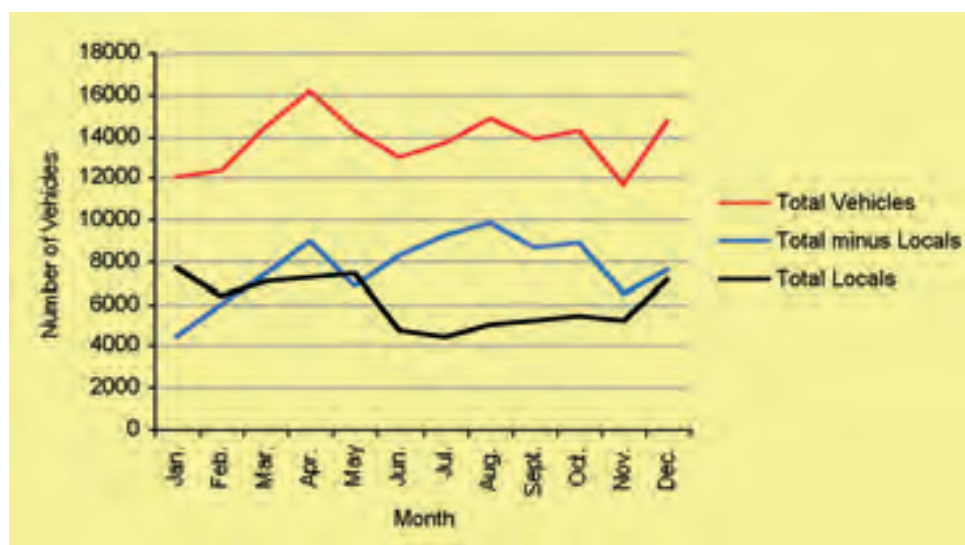


Figure 7. Comparisons between local vehicles, other vehicles and total number of vehicles in 2003.

The graph in Fig. 7 shows the total estimated number of vehicles using the Upper Rock Nature Reserve. The density numbers between 12000 vehicles in the winter months to a

maximum of 16000 vehicles in the Easter period and slightly smaller numbers during the summer period. When eliminating the local vehicles from this equation we can see that the peaks and troughs of the tourist sector match those for all vehicles significantly, showing that the increases and decreases are determined not by the local vehicles but by significant increases and decreases in the tourist trade. When the local vehicles, including motorcycles, are plotted on the graph the graph does not mirror the tourist sector or the vehicle total and shows a significant decrease during the summer months where the local population reverts to the beaches, returning to the Nature Reserve in numbers only during the mild weather periods of the other three seasons. Although we see in the weekday and weekend mean that local vehicles are a dominant feature of the Upper Rock roads, when we take into account the tourist trade as a whole, i.e. taxis, coaches and private tourist vehicles, we find that it is the tourist sector and not the local sector that has a greater bearing on traffic with all the detrimental effects this has with regard to atmospheric and noise pollution, road wear and tear and traffic conglomeration in the Nature Reserve. Local vehicles mainly drive through the Upper Rock without stopping, and therefore cause very little in the way of traffic jams. Local vehicles especially avoid the St. Michael's cave area, since it is well known to residents that there are usually large concentrations of tour operator and private tourist vehicles and very little parking available. It can be said, therefore, that eliminating local vehicles would do little to alleviate traffic problems.

Clearly though, locals have a considerable interest in the Upper Rock and should be considered when improvements are being planned. Facilities should therefore be improved and made available at times when locals use the Upper Rock.

21.8 The Proposed Funicular Project

The Funicular project is being led by a consortium of United Kingdom businessmen from Knightsbridge Investment Trust Limited, who are represented locally by Mr. Leslie Ratcliffe and the Swiss company 'Paul Glassey SA'. They are registered under the company name '21st Century Rock Ltd.' and have engaged the services of local architect Mr. Michael Azzopardi and Chartered Surveyors 'Brian Francis and Associates'.

Mr. Ratcliffe contacted GONHS' General Secretary in the summer of 2002 to discuss the funicular project and gauge GONHS' views with regards to the environment and the possibilities of carrying out an environmental impact assessment. The view of GONHS was that this project was detrimental to the objectives of the Society and would have a negative impact in several of the key issues and objectives which GONHS had identified and were being investigated as part of the Upper Rock Nature Reserve management plan. The General Secretary categorically told Mr. Ratcliffe that GONHS was opposed to such a project and that this venture would not receive their support at any stage.

Subsequently a meeting was held at the Europort Offices of the Department of Trade and Industry hosted by Mr. Richard Garcia of the Gibraltar Tourist Board and Mr. Paul Origo, the Town Planner. GONHS' General Secretary John Cortes was present as were Prof. Clive Finlayson and Mr. Carl Viagas of the Heritage and Planning Division and Mr. Joe Desoiza of the Heritage Trust. After lengthy discussions the three aforementioned bodies clearly stated that they did not support the project. These discussions did not mean that the project had been rejected by the Development and Planning Division, but all three bodies expected, and were under the impression that the project would be withdrawn.

It came as quite a surprise then that after several months a second report, 'Feasibility Report 2' dated 31st July 2003 (Glassey 2003) was released in November 2003. This report played on the many reservations that the three bodies had brought up in their discussions, and proceeded to attempt to address the issues. The main differences with the initial report were the relocation of the track to a more direct route to the top and diminishing the visual impact by locating the rail track on the ground as opposed to an elevated rail (this having a greater direct impact on the vegetation). The project also envisaged a 230m tunnel taking the rail from the Northern Defences and emerging at a location close to Princess Caroline's Battery

Late in 2003 the matter was raised at the Development and Planning Commission where the Town Planner recommended that the project would require an environmental impact assessment. The developers then engaged the services of 'Environmental Gain Ltd.' to carry out this assessment. This company's representative, Ms. Nikki Wood, met with representatives of GONHS and had frank discussions over the issues and problems relating to the funicular. The discussions were obviously related to environmental and ecological perspectives, and Ms Wood also held meetings with the other concerned bodies to gauge their opinions in the lead up to the preparation of the Scoping Report (Wood 2004) which was submitted on 3rd March 2004 to the Development and Planning Commission in the lead up to the final environmental impact assessment.

The Funicular project is a different means of proposed transport that intends to operate within the Upper Rock Nature Reserve. Will this solve any of the Nature Reserves problems? To begin with, this is not an alternative means of transport that will alleviate the traffic congestion on the Upper Rock Nature Reserve. This project is initially, solely aimed at targeting pedestrian tourists in the Casemates area, but will eventually also tap the cruise ship and trans-frontier visitors. It does not, however, provide an alternative to those tours offered by taxis and coaches, for reasons explained below. Therefore, like the Cable Car some decades before, it will not lessen to any degree the vehicular impact on the Upper Rock roads.

Will the funicular convey visitors to the existing tourist sites thereby alleviating pressure from vehicular traffic to reach these sites? The answer is no. The funicular will exploit a completely new area with a proposed top terminal station south of Rock Gun. This also envisages a walkway around the whole of the Rock Gun area. The whole area is still in MOD hands, and will be up to 2005. Despite numerous meetings with the MOD, whenever the funicular project has been raised, much to our surprise we have been met with blank faces, and kept very much in the dark. At no time had the MOD mentioned that the Middle Hill and Rock Gun area would be handed to the Gibraltar Government, neither has the Gibraltar Government hinted in that direction either. Nevertheless we believe that the consortium of businessmen would not have embarked on such a project if the appropriate guarantees and commitment to this had not been granted by both the Gibraltar Government and the MOD.

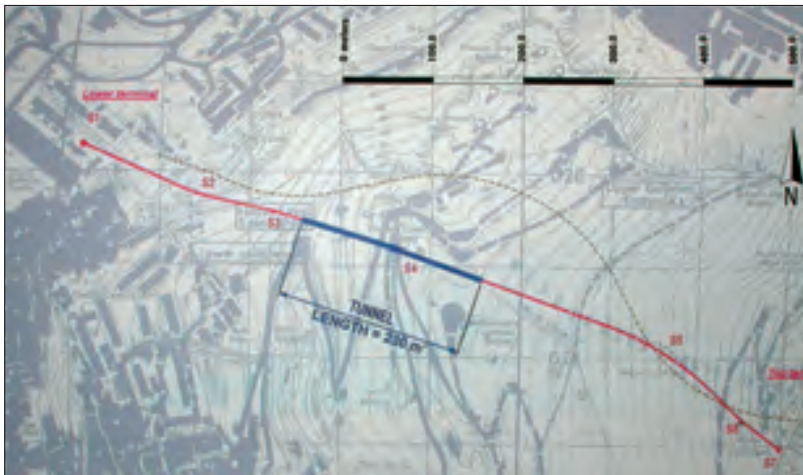
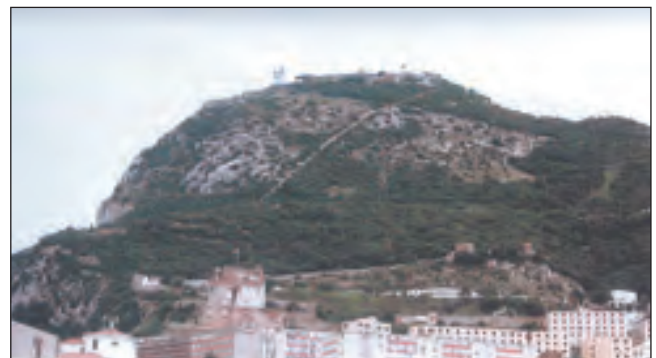


Figure 8. Second more direct proposed funicular route. (taken from Glassey (2003)).

The Funicular Project intends to cut through the Northern Defences close to the Moorish Castle walls, and then continue through a tunnel exiting close to Princess Caroline's Battery where the funicular would continue its ascent, dissecting the old water

catchments to terminate south of Rock Gun. The construction and implementation would have grave repercussions on the environment, with the construction of the track at ground level, sectioning this scenic part of the Nature Reserve in two. Visually, the track will be seen from the town area to the north, and although the developers have implied that they can hide this by planting trees along the length of the track, given the soil depth, and the steep incline of the slope, this is virtually impossible. The best that can be achieved are olive bushes and these will take many years to even begin to obscure any construction. However, even this measure will obscure the characteristic white face of the area below Rock Gun, which can be seen in many brochures and most postcards in town.

Figure 9. Second proposed route. View from the City. (taken from Glassey (2003)).



Ecologically this is a key area of vital importance to most of the Gibraltar endemic and endangered plants. It also holds the 'wild' group of macaques that has served and continues to serve as research material for numerous university students worldwide, and is the authors' proposed biological reserve as the only area within the Nature Reserve where man has little impact (and now we want to let everybody loose in the area?).

A Funicular type of transport would be more appropriate if it was an *alternative* to alleviate the existing traffic and transport problem, if it utilised or was located adjacent to existing roadways and also if it served to convey visitors to existing sites. The location of a funicular alongside or on existing roadways would reduce the environmental impact since visually it would follow and merge with existing roadways. More importantly it would not section or fragment any part of the Nature Reserve more than the roads themselves do at the moment, and

the construction and operation of the funicular would be aided by the communicating roadways. This has to be visualised with a drastic reduction in traffic, thereby opening up the roadways to residents, essential and emergency vehicles and more importantly to pedestrians, now that the roadways would significantly be practically traffic free.

In any alternative transport system, consultation, agreement and direct involvement of the existing tour operators are paramount. The Taxi Association and coach tour operators are ultimately responsible for conveying most of the visitors to the Nature reserve at present. A system that undermines this arrangement, leading to a substantial loss in their takings, would, the authors believe, not be appropriate morally or legally, as these sectors have acquired rights. In this respect any alternative should include a direct involvement of these sectors and should not affect their economic benefits.

21.9 Recommendations

1) In the authors' opinion, the difficult problem of transport and traffic congestion is by far the most difficult of subjects for which to find suitable answers and alternatives. We understand that the Gibraltar Government makes a large profit from the Nature Reserve and wishes to continue to do so. Similarly the taxis, and coach tour operators want to see a continuation of their healthy trade. But realistically the increasing problems that continue to plague the Upper Rock Nature Reserve, which all the aforementioned sectors recognise, are a combination of the mistakes of all three. None of them contribute anything to improve the situation within the Upper Rock Nature Reserve, considering the substantial economic benefits they all obtain. Only M. H. Bland, managers of the Cable Car, have contributed by providing a computerised interpretation facility. The authorities simply apply necessary and cosmetic arrangements to conform to statutory obligations and appease public criticisms, i.e. firebreak maintenance or road cleaning, and the other two sectors reproach the Government for not carrying out improvements. If we are to see a drastic change in the Upper Rock Nature Reserve, we must expect commitments and sacrifices on the part of all three. To begin with, we need substantial economic contributions to the Nature Reserve on the part of the Gibraltar Government, tied in with relevant and meaningful negotiations with the taxi and coach tour operators, which will result in a constructive approach to the transport and traffic problem and substantial improvements to the Nature Reserve.

2) Traffic flow coming down through the Upper Town area from the Upper Rock should be redirected through the tunnel system that includes the Great North Road. This would avoid traffic congestion in what is an awkward sector of the town for tourist drivers. In addition, it would also give tourists an insight to the WWII tunnels and their history. Also, adequate control of traffic coming down through the Upper Town could relieve this area of the traffic problems that currently affect it (P. Origo, *pers. comm.*).

3) Promotion of an environmentally friendly mode of transport as an alternative to the present system of coaches and taxis. Ideally a hop on hop off loop-system with regular stops at all sites would solve many of the traffic problems. This could be a tramway or funicular system, or even a mini van shuttle, located at the Lathbury Barracks, which would pick up the tourists from taxis and coaches. They would then be conveyed to all the sites travelling then back through the Great North Road and dismounting at the Casino exit from where they would walk through the Alameda Gardens and down to the pick up point at Grand Parade.

4) All tour operators should operate their vehicles on Biodiesel. This is currently being investigated by M.H. Bland Ltd.

5) Any alternative transport modality for the Upper Rock Nature Reserve must not impact negatively on the natural assets of the area, and at the same time be in the interest of the present tour operators and should involve consultation, approval and ultimately direct involvement and a share in the new enterprise.

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22. Opportunities

22. Opportunities

Gibraltar has the chance to improve its environmental profile at international and national levels by applying a set of strict rules and objectives that will ensure the protection and conservation of its flora and fauna, that will create awareness of environmental issues among the local population, promote sustainable tourism projects and ensure a rich, sound and healthy environment for future generations. This set of strict rules and objectives is arranged in a document known as an 'Environmental Charter'. The Charter is composed in a way that will suit the needs of the area to which it is applied, and is formulated by experts in the field to cover all environmental issues and their sustainable development, rural economic development and educational needs. In fact, environmental charters vary very little indeed from area to area or country to country, because the requirements of the natural environment and sustainable development are broadly similar everywhere, with very little variation. These Charters are applied by city councils, boroughs, municipalities and provinces in the United Kingdom and the rest of Europe and the World, and also by NGO's in Natural Parks, Nature Reserves and protected areas.

Two of these charters, the 'Environment Charter for the UK Overseas Territories' and the 'Europarc Charter' could form the basis of Gibraltar's Environmental Charter. In view of this, we have reproduced their main objectives and supplied some background information on these.

22.1 Overseas Territories Environment Programme

The Programme Memorandum for the Overseas Territories Programme was published in September 2003. It consists of a joint programme from the Department for International Development and the Foreign and Commonwealth Office to support the implementation of the Environmental Charters, and environmental management more generally, in the UK Overseas Territories.

This programme provides a source of funding for an action plan to implement the Environmental Charter that was signed jointly with HMG in September 2001. Gibraltar and the British Antarctic Territory did not participate as signatories in this Charter. This came at a time when the FCO was considering the joint sovereignty proposals, and the Chief Minister opted out as he wanted to make the point that Gibraltar is internally self-governing with regard to the environment. Even if the Gibraltar Government did not want to accept a 'mandate' from the UK, the principles of the Charter are sound and can still form part of the Gibraltar Government's own Environmental Charter (a manifesto commitment in the 2004 General Elections). We have therefore transcribed the Environmental Charter for the UK Overseas Territories into this document to provide the authorities with the opportunity to use these guiding principles as a way forward in our efforts to unite Gibraltar with sound environmental practices. This does not exclude Gibraltar from requesting funds, but it does put the onus on the Gibraltar Government to apply a sound and credible environmental policy across the whole of its territory.

ENVIRONMENT CHARTER FOR THE UK OVERSEAS TERRITORIES:

Guiding Principles

For the UK Government, the Government of Gibraltar and for the people of Gibraltar.

- 1) To recognise that all people need a healthy environment for their well-being and livelihoods and that all can help to conserve and sustain it.*
- 2) To use our natural resources wisely, being fair to present and future generations.*
- 3) To identify environmental opportunities, costs and risks in all policies and strategies.*
- 4) To seek expert advice and to consult openly with interested parties on decisions affecting the environment.*
- 5) To aim for solutions which benefit both the environment and development.*
- 6) To contribute towards the protection and improvement of the global environment.*
- 7) To safeguard and restore native species, habitats and landscape features, and control or eradicate invasive species.*

- 8) *To encourage activities and technologies that benefit the environment.*
- 9) *To control pollution, with the polluter paying for prevention or remedies.*
- 10) *To study and celebrate our environmental heritage as a treasure to share with our children.*

Commitments

The Government of the UK will:

- 1) *Help build capacity to support and implement integrated environmental management, which is consistent with Gibraltar's own plans for sustainable development.*
- 2) *Assist Gibraltar in reviewing and updating environmental legislation.*
- 3) *Facilitate the extension of the UK's ratification of Multilateral Environmental Agreements to benefit Gibraltar and which Gibraltar has the capacity to implement.*
- 4) *Keep Gibraltar informed regarding new developments in relevant Multilateral Environmental Agreements and invite Gibraltar to participate where appropriate in the UK's delegation to international environmental negotiations and conferences.*
- 5) *Help Gibraltar to ensure it has the legislation, institutional capacity and mechanisms it needs to meet international obligations.*
- 6) *Promote better cooperation and the sharing of experience and expertise between Gibraltar, other Overseas Territories and small island states and communities, which face similar environmental problems.*
- 7) *Use UK, regional and local expertise to give advice and improve knowledge of technical and scientific issues. This includes regular consultation with interested non-governmental organisations and networks.*
- 8) *Use the existing Environment Fund for Overseas Territories (now superseded by the joint FCO/DFID UK Overseas Territories Environment Programme), and promote access to other sources of public funding, for projects of lasting benefit to Gibraltar's environment.*
- 9) *Help Gibraltar identify further funding partners for environmental projects, such as donors, the private sector and non-governmental organisations.*
- 10) *Recognise the diversity of the challenges facing the Overseas Territories in very different socio-economic and geographical situations.*
- 11) *Abide by the principles set out in the Rio Declaration on the environment and development and work towards meeting the International Development Targets (superseded by the Millennium Development Goals) on the environment.*

The Government of Gibraltar will:

- 1) *Bring together Government departments, representatives of local industry and commerce, environment and heritage organisations, the Governor's office, individual environment champions and other community representatives in a forum to formulate a detailed strategy for action.*
- 2) *Ensure the restoration and protection of key habitats, species and landscape features through legislation and appropriate management structures and mechanisms, including a protected areas policy, and attempt the control and eradication of invasive species.*
- 3) *Ensure that environmental considerations are integrated within social and economic planning processes; promote sustainable patterns of production and consumption within the territory.*
- 4) *Undertake environmental impact assessments before approving major projects and while developing our growth management strategy.*
- 5) *Commit to open and consultative decision-making on developments and plans which may affect the environment; ensure that environmental impact assessments include consul-*

tation with stakeholders.

6) Implement effectively obligations under Multilateral Environmental Agreements already extended to Gibraltar and work to the extension of other relevant agreements.

7) Review the range, quality and availability of baseline data for natural resources and biodiversity.

8) Ensure that legislation and policies reflect the principle that the polluter should pay for prevention or remedies; establish effective monitoring and enforcement mechanisms.

9) Encourage teaching within schools to promote the value of our local environment (natural and built) and to explain its role within the regional and global environment.

10) Promote publications that spread awareness of the special features of the environment in Gibraltar; promote within the territory the guiding principles set out above.

11) Abide by the principles set out in the Rio Declaration on the environment and development and work towards meeting international development Targets (now superseded by the Millennium Development Goals) on the environment.

Many of these goals have been achieved through GONHS' own initiative. Some have been realised in collaboration with the Gibraltar Government, but GONHS, although clearly committed to the environment, has not got the resources or funding to continue to produce, support, advise or address environmental developments at the rate these developments arise. They are certainly not ignored, but are processed as and when they crop up, all within the limitations of the Society, which handles all these matters on a voluntary basis. The Gibraltar Government, although aware of the important contribution GONHS makes on environmental matters, should recognise the limitations and provide the necessary funding and resources, especially for the role played in advising, providing and assessing developments in the environmental field where the Gibraltar Government depends entirely on the expertise and knowledge base of the members of GONHS.

22.2 The EUROPARC Federation

The condition of the Upper Rock as a Nature Reserve and a nature protection area needs to be established as such. One European body that can help stimulate the authorities in attaining and sustaining a reasonable level that will help enhance, expand and improve the tourist product in relation to the natural environment within a sustainable environmental level is the Europarc Federation.

This opportunity is especially aimed at the Tourism Agency, since one of the key elements of the Europarc Federation has been the development of 'The European Charter for Sustainable Tourism in Protected Areas'. We should adopt this document and become candidate members of Europarc, and in the process learn from other Charter members about their problems, concerns and achievements from which we can further understand the meaning and practical use of the term 'sustainable tourism.'

This is not a question of making more money; we probably make more than most, if not all of the European Parks, Nature Reserves and protected areas. It is a question of values; our natural values, the quality of the environment and heritage, and the sustainable use and development of the same, in order to ensure that future generations of Gibraltarians will be able to enjoy and reap the benefits from Gibraltar's Upper Rock Nature Reserve and unique environment.

22.2.1 Europarc

The EUROPARC Federation was founded in 1973 and brings together a wide range of organisations and individuals involved in the policy and practice of managing parks and protected areas across Europe. Europarc believes that parks and protected areas can play a key role in conserving and enhancing the continent's natural and cultural heritage and in charting the path towards more environmentally sustainable lifestyles and approaches to development in society as a whole.

Their aims are to:

- Facilitate the establishment of new parks and protected areas.
- Promote good practice in the management of such areas.
- Raise their profile as a vital means of safeguarding many of the continent's most valuable natural heritage assets and thereby increasing support for their future protection.

• *Influence the future development of public policies and programmes, at the international level, to the benefit of their objectives.*

Membership of the Europarc Federation brings with it useful benefits. The Federation has access to information about parks and other protected areas and their management throughout Europe, which can be consulted and applied to the Upper Rock Nature Reserve. There is also the opportunity for a range of services for the exchange of experience and staff, enabling them to increase expertise and knowledge for daily work in protected areas. They facilitate the exchange of information on protected area management and natural heritage conservation between European and Worldwide organisations.

An interesting aspect of Europarc is the relationship of trans-border cooperation in conservation management. In certain parts of Europe some protected areas extend their boundaries into other countries and Europarc facilitates the protocols taken in conservation management across the entire area. In Gibraltar we do not have this problem, for the Nature Reserve falls entirely within the territory's boundary. However, with the proposed 'Natural Park of the Straits', which is to include Northern Morocco and Southern Spain, and could also include Gibraltar, there might be a logical case for a non-political entity such as Europarc to assist in any future discussions of an environmental nature.

Europarc has identified a series of objectives, which we now copy for the benefit of the readers of this chapter.

1) *to facilitate the exchange of expertise on management skills and management planning among protected area staff in Europe, through the organisation of workshops, seminars, study visits and staff exchanges.*

2) *to develop and implement a strategy for supporting trans-frontier protected areas across Europe.*

3) *to develop and implement a strategy for supporting protected areas in their management of tourism through the European Charter for Sustainable Tourism in Protected Areas.*

4) *to demonstrate and apply the wealth of experience of the EUROPARC membership in the management of sensitive landscapes to the management of Natura 2000 sites.*

5) *to influence the future of rural development policy in the EU to reflect the experience of the membership in reconciling nature conservation with socio-economic objectives.*

6) *to maintain a system of publications, reviewed periodically to assess its effectiveness. This shall include regular information bulletins / newsletters (3-4 per year), topical reports and conference / seminar reports.*

7) *to develop a network of EUROPARC websites, with benefit (if possible) of commercial sponsorship.*

8) *to organise an Annual General Assembly and Conference.*

9) *to promote active cooperation and partnership between protected areas within Europe and also, where appropriate, with counterparts in other continents.*

10) *to set up and maintain a database of members and protected area experts.*

11) *to disseminate specialised information on protected area management through a suite of topic networks.*

Although many of these objectives do not apply to Gibraltar (as in the case of the rural development policy) it would be of great benefit if the management of the Nature Reserve formed part of this network of European parks, protected areas and Nature Reserves, and more importantly adopted 'The European Charter for Sustainable Tourism in Protected Areas'. Here, again, we have taken the liberty to detail the background, statute and aims of the Charter.

22.2.2 The Charter's framework

The European Charter for Sustainable Tourism in Protected Areas reflects worldwide and European priorities, as expressed in the recommendations of Agenda 21 adopted at the Earth Summit in Rio in 1992, and by the European Union in its 6th Environment Action Programme and Strategy for Sustainable Development. The Charter belongs to the

EUROPARC Federation, the umbrella organisation of protected areas in Europe. It was developed by a European group representing protected areas, the tourism industry and their partners, under the EUROPARC umbrella, and builds on the recommendations of EUROPARC Federation (2001). The Charter was one of the priorities defined in the World Conservation Union's action programme for protected areas in Europe, "Parks for Life" (1994). The growing importance of sustainable tourism development as an area of international concern has been underlined by the recent elaboration of "International Guidelines for Sustainable Tourism" under the Convention on Biological Diversity. The European Charter directly addresses key principles of these International Guidelines, and represents a practical tool for their implementation at the regional level of protected areas.

22.2.3 Implementing the concept of sustainable development

This Charter promotes implementation of the concept of sustainable development, i.e. "development that meets the needs of present generations, without compromising the capacity of future generations to meet their needs" (Brundtland Report). This form of development involves the preservation of resources for future generations, viable economic development and equitable social development.

The European Charter for Sustainable Tourism in Protected Areas is a valuable and practical tool for ensuring that tourism development in Europe's protected areas is sustainable. In becoming members of the Charter, protected areas demonstrate that they are cooperating to a high level with local stakeholders and tourism partners to address strategic tourism issues, and receive official recognition for their achievements in this field. At the same time, in joining the Charter they are making a 5-year commitment to further that cooperation, to implement agreed joint actions with their partners, and to continue striving for excellence in the management of tourism in their regions. The European Charter is thus neither a conventional quality label, nor a conventional partnership agreement, but combines elements of both to encourage and support a truly sustainable development of tourism in Europe's protected areas.

22.3 The Charter

Developing tourism in protected areas according to the principles of sustainable development

The underlying aims of the European Charter for Sustainable Tourism are:

- To increase awareness of, and support for, Europe's protected areas as a fundamental part of our heritage, that should be preserved for and enjoyed by current and future generations.*
- To improve the sustainable development and management of tourism in protected areas, which takes account of the needs of the environment, local residents, local businesses and visitors.*

A small Charter, you might think, with one statute and two aims that can easily be achieved by Gibraltar. However, the realisation of this charter comes at a price, and the price to pay is the implementation of, not only all the key goals and objectives in our management plan, but the execution of the key tourism objectives listed below as required by the Charter.

1. To protect and enhance the area's natural and cultural heritage, for and through tourism, and to protect it from excessive tourism development, by:

- monitoring impact on flora and fauna and controlling tourism in sensitive locations.*
- encouraging activities, including tourism uses, which support the maintenance of historic heritage, culture and traditions.*
- controlling and reducing activities, including tourism impacts, which: adversely affect the quality of landscapes, air and water; use non-renewable energy; and create unnecessary waste and noise.*
- encouraging visitors and the tourism industry to contribute to conservation.*

2. To provide all visitors with a high quality experience in all aspects of their visit, by:

- researching the expectations and satisfaction of existing and potential visitors.*
- meeting the special needs of disadvantaged visitors.*
- supporting initiatives to check and improve the quality of facilities and services.*

3. To communicate effectively to visitors about the special qualities of the area, by:

- ensuring that the promotion of the area is based on authentic images, and is sensitive to needs and capacity at different times and in different locations.
- providing readily available and good quality visitor information in and around the area, and assisting tourism enterprises to do so.
- providing educational facilities and services that interpret the area's environment and heritage to visitors and local people, including groups and schools.

4. To encourage specific tourism products which enable discovery and understanding of the area, by:

- providing and supporting activities, events and packages involving the interpretation of nature and heritage.

5. To increase knowledge of the protected area and sustainability issues amongst all those involved in tourism, by:

- providing or supporting training programmes for staff of the protected area, other organizations and tourism enterprises, based on assessing training needs.

6. To ensure that tourism supports and does not reduce the quality of life of local residents, by:

- involving local communities in the planning of tourism in the area.
- ensuring good communication between the protected area, local people and visitors.
- identifying and seeking to reduce any conflicts that may arise.

7. To increase benefits from tourism to the local economy, by:

- promoting the purchase of local products (food, crafts, local services) by visitors and local tourism businesses.
- encouraging the employment of local people in tourism.

8. To monitor and influence visitor flows to reduce negative impacts, by:

- keeping a record of visitor numbers over time and space, including feedback from local tourism enterprises.
- creating and implementing a visitor management plan.
- promoting use of public transport, cycling and walking as an alternative to private cars.
- controlling the siting and style of any new tourism development.

22.4 Recommendations

It is our opinion that the implementation of the key issues set above, as part of the requirements of the Charter, can only serve to improve and benefit the state of play of the Upper Rock Nature Reserve. At the present moment these objectives are not achievable. Only through a conscientious and programmatic approach of the implementation of the Management Plan will the Upper Rock Nature Reserve be in a position to embark upon the objectives set out, specifically aimed at a sustainable tourism product.

Government will have to reconfigure their tourism strategy for the Upper Rock once the management plan is in operation. Amongst some of the key issues we have identified are:

- Quality of the product.
- Value for money.
- Consideration for the environment.
- Regulation of visitors.
- Regulation of vehicles.
- Pollution control.
- Transport policy.
- Credible infrastructure for environmental management and conservation issues.
- Interpretation centres for nature and heritage.
- Publications, specific or otherwise.
- Educational needs.
- Improved sanitary conditions.

When the management plan has been in operation for a few years and the major issues of the Upper Rock Nature Reserve and other environmental issues around Gibraltar have been addressed, then the authorities will be in a position to be able to adopt an Environmental Charter. Once this is in operation, the management of the Nature Reserve should apply for candidate membership of the Europarc Federation and adopt their charter for sustainable tourism. All this will result in the application of a sound environmental strategy throughout the territory of Gibraltar, and provide future generations with opportunity to enjoy the benefits of a clean, healthy and sound environment.

References

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23. Management Plan

23. Management Plan

Gibraltar is unique in that about 40% of its surface area is designated a Nature Reserve. The unique topography and the Barbary macaques are without doubt the prime attractions enticing vast numbers of tourists to the Rock. This has created an economic source for the Government of Gibraltar that is of great benefit to the community as a whole. This must clearly continue. Yet we must not forget the unique environment that provides us with these benefits. The environmental integrity of the Upper Rock is not without its threats and challenges, and this could, and is, seriously affecting the stability of the Nature Reserve. It is our opinion that the way forward is a Management Plan that adopts a pragmatic approach, enabling the Nature Reserve to develop in a sustainable manner by combining economic interests together with the clear environmental requirements. This plan and its supporting chapters encompass the first step towards a self sustainable Nature Reserve that should benefit future generations of the people of Gibraltar for years to come.

23.1 Structure

To enable us to clearly understand the requirements necessary for the creation of a suitable structure in the development of the management plan for the Upper Rock Nature Reserve, several documents were consulted. Some of these, like the 'Environmental Management Plan for Seychelles' (2000), and the 'Falklands Conservation Five Year Plan 1999-2004' (1999), encompass whole territories composed of several islands, and include thematic areas in marine resources, agriculture, energy etc. These areas have no bearing on our Reserve. However, other thematic areas have similar environmental pressures and problems, e.g., invasive species, environmental sustainability, biodiversity, land use, etc. Other plans, like the 'Nature Conservation Management Plan for Predannack Airfield' (1999), are of a smaller nature but with similar problems that are addressed in a comparable fashion. Some include tourist development programmes whereas others have military constraints within their location and these were chosen because of the similarities in environmental, ecological, and touristic pressures, and other aspects of use that these areas have with Gibraltar.

At a local level, the 'Biodiversity Initiative: Gibraltar. A Case for Maintaining Biodiversity' by GONHS (1994) was consulted. This provided us with a background to the structure of the environmental aspects of the management plan. Finally the 'Upper Rock Nature Reserve. An Environmental Impact Assessment Report 2002' by C.E. Perez (2002), highlighted details and provided suggestions for the improvement of the Upper Rock Nature Reserve. This proved fundamental in the composition of the programmed approach to much of the management plan.

23.2 Proposed Plan Implementation

23.2.1 Institutional Arrangements and Composition

The Upper Rock Nature Reserve requires the input of several different Government departments, institutional bodies, businesses and entities (i.e., stakeholders), all of which have either vested interests or participate in one way or another in the use, repairs, maintenance and general condition of the area. These are:

- Gibraltar Tourist Board: currently responsible for the sites and the whole of the Nature Reserve
- Ministry for the Environment: should be responsible for the Nature Reserve other than the sites, ticket sales, etc.
- MOD: still own and control a large portion of the Upper Rock, until these are passed over to the Gibraltar Government
- GONHS: acts as consultant on environmental matters, and actively participates in research on all environmental aspects of the Reserve, including macaques, bats in caves, etc. Also responsible for the feeding and management of the macaques
- Heritage Trust: historical heritage found within the Reserve
- Gibraltar Museum: archaeological and historical heritage found within the Reserve
- M.H. Bland: the Cable car and Bland and Calypso tour buses
- Taxi Association: taxis and Persian Rose tour buses
- City Fire Brigade: fire hazards and maintenance of water tanks, fire hydrants, ancillary equipment, etc.
- Royal Gibraltar Police: security, wildlife liaison officer and enforcement of Nature Protection Ordinance
- Support Services: highways repairs, maintenance and sewerage

and to a lesser extent,

- Land Property Services: as the management company for the Upper Rock residents
- Housing Department: representing the residents at Poca Roca
- GONHS Caving and Climbing section: activities within the Reserve and additional backing for cave digs and rescues
- Gibtelecom: telephone lines, aerals, etc.
- Aquagib: water supply and pipelines
- Environmental Agency Ltd.: pest control
- Gibraltar Scout Association and Gibraltar Girl Guide Association: camps located within Reserve
- and of course, the general public.

23.3 Proposal 1

1) Based on our findings and the situation at present, the authors believe that the best management system for the Upper Rock Nature Reserve is one that must work independently from any governmental constraints, but in keeping with governmental policy and programme of works, where the contractors would be paid a percentage of the takings to allow the economic means to provide the maintenance, repairs, improvements, stability and well-being of the rest of the Nature Reserve.

2) Management policy and works programmes for the Upper Rock Nature Reserve should be developed by a newly constituted Board of Management made up of the main stakeholders, who would have direct input on decision making and formulation of policy, dealing with subjects other than that related to the tourist sites (where these have no direct bearing on the Nature Reserve).

3) This would release the Gibraltar Tourist Board to concentrate and diversify on the Upper Rock sites and other aspects of tourism that would complement the efforts made by the management company for the Upper Rock Nature Reserve, thereby increasing the overall potential and benefits for the community as a whole.

4) Responsibility for policy on tourism and transport on the Upper Rock and including the sites would fall under the Ministry for Tourism and Transport and the Gibraltar Tourist Board, whereas responsibility for policy on the environment and other matters relating to the Upper Rock Nature Reserve would fall under the Ministry for the Environment.

5) There should be close and regular liaison between the Tourist Board and the Upper Rock Board of Management.

23.4 Proposal 2

1) The Government of Gibraltar to maintain overall responsibility for the administration and management of the Upper Rock Nature Reserve, under the management structure proposed below.

2) The Government, within the Ministry for the Environment, to set up a 'Board of Management' of the Upper Rock Nature reserve, to be constituted from the departments, organisations, institutional bodies, etc., as listed in the 'Institutional Arrangements and Composition' paragraph (23.21). Not all of these need representation, for many have only but a small role, but should be consulted whenever necessary.

3) The Board to formulate policy, provide advice and guidance and act as arbitrators in cases of conflicts or disagreements regarding implementation, funding or programme proposals and/or formulation.

4) The Board of Management to liaise with both the Ministry for the Environment and the Gibraltar Tourist Board, both of which would have representation on the board. These two departments, working together, should provide the 'Secretariat', as they are ideally suited to providing the logistical and secretarial support to the Board. This to involve administrative support in monitoring, co-ordination, reviews and implementation of policy decisions.

5) The Board of Management to employ a Manager that would organise and implement the policy decisions, works programmes and recommendations arrived at by the Board.

In both Proposal 1 and 2, the Government, may decide to engage, though its Board of Management, a Management Body, a competent firm or organisation to carry out the latter's policies and to act as the Executive of the Board in management, etc. This role would be roughly equivalent to that carried out by the "Director Conservador" of an Andalusian 'Parque

Natural'. It would involve generating ideas for the Board to consider, keeping up to date with Directives and other international initiatives, and implementing the policies.



Figure 1. Management structure for Proposal 2.

23.5 Division of Responsibility

In our scheme, the Ministry of Tourism and Transport would be the Agency with responsibility for all existing and future tourist sites. This should include the ticket offices at entry to the Reserve and the control of traffic at Jews Gate and St. Michael's cave and any other points thereafter including security on the Rock, especially after hours at the Moorish Castle entry point. The Ministry has adequate experience dealing with these sites in the past, and is therefore ideally suited to maintaining the product from a tourism perspective.

Similarly, the Ministry of the Environment would be the Agency with responsibility for all environmental matters within the Upper Rock Nature Reserve, including the Barbary macaques. This should include heritage, highways, cleaning and other related subjects. The environment and heritage on the Upper Rock has long been neglected and this Ministry's remit is adequate in incorporating and addressing those needs whilst allowing the Ministry for Tourism to tackle the tourist product, and consulting the Ministry for Heritage where necessary. It is wise that this Ministry should have taken over the Barbary macaques as one of its responsibilities since, although directly related with the tourism, the requirements for the management and feeding of these animals, as well as the interaction and impact they have on their surroundings, falls better under an environmental department rather than a tourism directed one.

The monies collected for entry into the Upper Rock Nature Reserve and the sites should be administered by the Board of Management of the Nature Reserve. An 'Annual & Recurrent Works Programme' including a financial breakdown of recurrent expenditure would be submitted by the Ministry for the Environment, re environmental management, etc, and the Ministry for Tourism re management of sites, security etc. The Management Body would manage this through the Management Board.

23.6 Implementation Methods

23.6.1 Implementation

The Board should establish an 'Annual Works Programme' elaborated by the management body based on the programmes presented in the Management Plan. Financing and implementation agreements would form the basis of the implementation.

23.6.2 Workforce

The workforce of the Upper Rock Nature Reserve to be composed of a habitat and environmental management workforce of 10-12 persons and a contingent of 6 wardens.

23.6.3 Management

The Board of Management would employ a Manager who would organise and implement

the policy decisions, works programmes and recommendations arrived at by the Board. He would have, under his authority, the Habitat Management work force and the Wardens contingent. The Manager would monitor progress of all works programmes, and report back to the Board on a regular basis.

23.6.4 Monitoring and Review

The structure of the Management Plan dictates that it is reviewed annually so that the elaboration, implementation and revision of the programmes can take place. The Secretariat should work with the Management Body that would submit new programmes for the Management Plan. These programmes are to be reviewed by the Board. Continuous monitoring is of critical importance for the success of the Plan and would be the mandate of the Secretariat.

23.6.5 Reporting

Implementing Agencies to supply aspects of the development of programmes and implementation to the Secretariat on a regular basis, which in turn would report to the Board of Management.

23.6.6 Public Relations & Perception

The Secretariat to hold briefing sessions with other interested organisations and public bodies to invite participation and suggestions to the Plan in the form of new programmes and initiatives. It is recommended that information on the development of programmes is made available to the public on a regular basis, namely through press releases, media coverage or even in the form of a newsletter.

23.6.7 Financing

The costs for the annual maintenance, repairs and improvements and the development of the Nature Reserve, including staff costs, should be provided by the entrance fees. Capital and emergency expenditure for large projects, e.g., road widening, installation of sanitation facilities and infrastructure, etc., should be borne in full by the Gibraltar Government as part of the improvements to the Nature Reserve under the 'Gibraltar Development Plan' (1991), subject to approval by the Development & Planning Commission, after an environmental impact assessment has been carried out.

Chapter 24, 'Action Plan', includes a specific breakdown of the costs required as part of the Management Plan, and includes recurrent expenditure. Financial details are approximate and based on current rates at the time of the publication of this document.

23.6.8 Future Improvement

To ensure the success of the Management Plan it is crucial that the Secretariat implement a training and facilitation programme for sectors needing this type of improvement, expertise and skills. In this respect it is important to build partnerships with organisations, especially GONHS, the Heritage Trust and the Gibraltar Museum who have the knowledge and skills, in their respective fields that are capable of supporting and improving the programmes in the Management Plan.

23.7 Principles

The strategy that has to be pursued should integrate the following core principles:

- **Integration of factors**

The realisation that social, economic and natural systems are really part of the greater environment as a whole.

- **Ecological Integrity**

The productivity, health and diversity of the ecosystems of the Upper Rock have to be restored.

- **Continual Improvement**

The need for a constructive approach towards evaluating and improving the product from a tourism, historical and environmental perspective.

- **Focus**

Adopting a programmatic approach to facilitate an ongoing continual improvement around sustainable management.

- **The Precautionary Principle**

The recognition that the environment is complex and extremely diverse requires a conservative approach to developments with unknown consequences.

- **Future Development**

Strategies to encourage the sustainable development and interests of environmental, historical and touristic programmes.

23.8 Goals and Objectives

A number of important goals have been identified and these are supported below by a series of objectives (in italics) that will help implement and achieve these aims. Some of these goals are already in the implementation stage and only require continual monitoring, whereas others can only be achieved through specific training and education to meet the necessary skills to accomplish these targets. A number of programmes have been devised to run on a continual basis with constant revision and monitoring. As the implementation of the programmes and objectives develop, new goals will be identified and so the process of managing the Upper Rock Nature Reserve will be achieved through mutual collaboration between the secretariat and implementing agencies, and the continual renewal and appraisal by the Board of Management.

1) Establish and maintain the biodiversity and ecological integrity of the Upper Rock Nature Reserve and ensure the sustainable capacity of core life support systems.

1.1 Programme to establish the biodiversity of the flora and fauna of the Nature Reserve in keeping with the mandate of the 'Biodiversity Convention'. Once there is a better understanding of the ecosystem, a strategy can be developed to protect specific areas and implement environmental impact assessment procedures and laws. This report goes some way towards achieving this aim.

1.2 Programmes to facilitate the rehabilitation of ecosystems that have been damaged as a result of human activity.

2) Build active partnerships and sound public involvement between the Gibraltar Government, the private sector and society in general in order to foster co-responsibility for the environmental management of the Reserve and the environment of Gibraltar.

2.1 Programme for involving all sectors of society (NGO's, Government, private sector, schools) to participate and co-operate in the environmental management and use the resources more effectively.

2.2 Programme to facilitate and encourage the participation of the Gibraltar Government, NGO's, businesses and the general public to sponsor biodiversity projects and actively foster conservation.

3) To fulfil and implement international directives and responsibilities as part of the Member State, the UK, in recognition of the fact that Gibraltar, at the crossroads of two continents and two seas plays a vital role in the conservation of ecosystems in the region.

3.1 Ensure that Natura 2000, the Biodiversity Convention, the Bonn Convention, the World Heritage Convention, Eurobat, the EC Birds Directive and the EC Habitats Directive are implemented with the designation of the sites.

3.2 Establish the requirements of all Directives and prepare the groundwork for the implementation of the same including special areas of conservation (SACs).

3.3 Prepare the financial budget to solicit community-funding sources (i.e. LIFE, Structural funds, Leader) for the implementation of the said Directives.

3.4 Ensure that Gibraltar is consulted when relevant Directives and other international instruments are being drafted or revised.

4) Develop programmes to effectively establish sustainable measures in the area of environmental management.

4.1 The establishment of an environmental management unit of 10-12 persons to effectively tackle habitat succession, pathways, firebreaks, and invasive species.

4.2 Programme for the training and management of personnel employed in key areas of environmental habitat management.

5) Establish the control and eradication of invasive species.

5.1 Programme for the identification, and location of key invasive species and a strategy of eradication using environmentally friendly means and devices (see Chapter 8).

5.2 A public perception programme on the damage invasive species can and do cause, especially aimed at the residents of the Reserve.

6) Develop a re-introduction programme of fauna and flora beneficial to the Nature reserve.

6.1 Establish a programme of co-operation with local and international NGO's and other

¹ 'The Gibraltar Biodiversity Project' launched in Jan. 2004 by GONHS.

bodies to grow all endemic and near endemic plants and indigenous tree species of Gibraltar, with a view to replanting and re-introducing these.

6.2 A programme to introduce the Spanish ibex, Barbary sheep and roe deer with 1) the view of enhancing the tourist product, and more importantly 2) as a means of controlling the vegetation in specific areas, with these grazing and browsing animals.

7) Develop a conservation action plan for the MOD land within the reserve.

7.1 A conservation action plan for MOD areas was published in 2003 by GONHS (Bensusan & Perez 2003).

7.2 Monitor the implementation of the suggestions in the MOD action plan, even once current MOD sites pass into Government custody, and revise and review where appropriate.

8) Continuously reconfigure and develop the strategies for the population control of the yellow-legged gull and control and management of the Barbary macaque, based on recent research.

8.1 Analyse past gull-control strategies and reconfigure to incorporate recent trends and population distribution.

8.2 Develop a population control strategy for Barbary macaques based on recent research, but also on the requirements of the Reserve in keeping with sound environmental practices.

8.3 Take into consideration all the recommendations and suggestions that were discussed at the 2003 conference 'The Barbary Macaque: Comparative and Evolutionary Perspectives'.

9) Establish and implement guidelines for a sustainable management policy for the Barbary macaques.

9.1 Continuously reassess adequate group size and numbers to enable efficient management strategy.

9.2 Establish interpretation centres at key locations to inform and educate the general public and promote the Barbary macaques.

9.3 Establish a sound and practical working relationship with the veterinary authorities to ensure the welfare of the macaques.

10) Establish a cave management and conservation programme.

10.1 Constitute the establishment of a cave management plan with suggestions and recommendations from, and through the involvement of, organisations and bodies with a legitimate interest in caves.

10.2 Establish the biodiversity of cave habitats and initiate programmes to research and conserve our cave ecology.

10.3 Establish guidelines for non-environmentally intrusive archaeological digs in caves, and insist on environmental impact assessments before the same may proceed.

10.4 Increase public awareness and understanding of the value of our caves and promote these concepts through publications, lectures and school curricula.

11) Develop a conservation strategy and management programme for all historical constructions and heritage on the Upper Rock.

11.1 Programme to identify all the historical sites, together with a management plan for the same (see Chapter 7).

11.2 Programme to develop key historical sites with tourism in mind, including improvements to existing ones.

11.3 Ensure the co-operation of implementing agencies with the environmental lobby to guarantee that the conservation strategy and management plan for heritage, encompasses an environmental impact assessment.

12) Reconfigure and develop new strategies for the tourist product.

12.1 Programme for the enhancement of existing and development of new tourist sites on the Upper Rock.

12.2 Programme to incorporate new technological advances to improve the tourist product, re: sound, vision and robotics.

12.3 Restructuring of the façade of all tourist sites using environmentally friendly material and methods.

13) Establish commercial concessions at the tourist sites with the vision of re-investing a percentage back into the Nature Reserve.

13.1 The development of commercial concessions at key sites should form part of the sustainable development plan for the Nature Reserve.

13.2 Encourage articles and publications of a historical and environmental nature appertaining to the site, to be the key elements on sale.

14) Establish adequate informative plaques and signs at key tourist sites and at strategic locations around the Nature Reserve.

14.1 Installation of plaques with suitable graphical information appertaining to the site in question, preferably in several languages, or utilising self-explanatory graphic symbols.

14.2 Installation of plaques with suitable graphical information at either end of pathways indicating the route, average time of the walk and specific features of natural and historical heritage the walker may encounter.

15) Establish ways to develop and promote Eco-tourism, in keeping with the natural environment.

15.1 Programme for the development of an eco-tourism pathway network and management resource.

15.2 The establishment of interpretation centres at key points, i.e., Apes' Den, Mediterranean Steps, Princess Caroline's Battery, etc.

15.3 The marketing and promotion of the products of the Nature Reserve focusing on the sustainable management of the same.

16) Establish proper environmental research facilities and promote the use of our resources efficiently.

16.1 Programme to build on the promotional efforts by GONHS and existing infrastructure, and establish and equip present and future research facilities with increase in demand.

16.2 Programme to encourage the use of research facilities for local educational needs.

16.3 The establishment of lines of communication and a common forum between research and management bodies.

17) Develop and augment more effective environmental public information and education.

17.1 Build on the increasing environmental information that would be available through the many programmes that will be pursued in this plan and develop the same through press releases, frequent publications and with environmental education curricula in mind.

18) Develop a competent transport system, capable of adequately conveying large numbers of people, quickly, silently and with a minimal impact to the environment.

18.1 Encourage the participation of all tour operators i.e., (Gibraltar Taxi Association, Persian Rose, Parodytur, M.H. Bland Ltd) in discussions to find an amicable solution to the traffic and transport problems encountered in the Nature Reserve.

18.2 Programme for the development of an environmentally friendly system of transport to be used efficiently taking into consideration the economic interests of all tour operators.

19) Limit the emission of greenhouse gases and other air pollutants in the Nature Reserve.

19.1 A programme to encourage and if possible enforce the use of 'Bio diesel' or similar non-polluting fuel, for public service vehicles.

20) Minimise the adverse impact of highways infrastructure on the environment.

20.1 Encourage a programme of road maintenance and resurfacing, at a suitable time of the day and year, which will cause minimum impact to the environment and to users and residents of the Nature Reserve.

20.2 Establish objective communications with appropriate agencies for an environmental impact assessment before works are approved. This to include works commissioned by the Gibraltar Government.

20.3 Encourage the use of low maintenance road surfaces, which will allow unimpeded traffic flow.

20.4 Establishment of a programme for the replacement of road railings using environ-

mentally friendly materials, and/or those materials with an aesthetic appeal in a Nature Reserve.

20.5 Encourage the implementing agency to review their highways strategy in the Nature Reserve on an annual basis.

21) Ensure that proper sanitation facilities are constructed at key locations and guarantee that wastewater disposal and infrastructure is effectively and discretely located.

21.1 Identify those key locations and assess the environmental impact that these constructions will have.

21.2 Ensure constructions are built with and utilise environmentally friendly materials and blend in with their surroundings.

21.3 Ensure that wastewater disposal and related infrastructure is located effectively and discretely and safeguard the environment from the possibility of pipeline bursts.

21.4 Insist on the usage of potable water in sanitation facilities, as this will have a minimal impact in case of pipeline burst or water seepage.

22) Establish a proper refuse collection strategy to include peripheral areas, pathways and picnic sites.

22.1 Provide key tourist and picnic sites with adequate refuse bins that are aesthetically and environmentally suited in a Nature Reserve.

22.2 Provide key Barbary macaque sites with monkey proof refuse bins that are aesthetically and environmentally suited to a Nature Reserve.

22.3 Establish a unit to clean peripheral areas, slopes, pathways, caves and picnic sites, with environmental sensitivity in mind.²

22.4 Encourage training and environmental management skills of unit personnel to achieve the aims of 21.3.

23) Encourage the establishment of an 'Upper Rock Disaster Exercise', with the corresponding agencies, to effectively assess the 'Upper Rock Disaster Plan' and test accessibility, suitable fire prevention infrastructure, evacuation measures and back up.

23.1 Establish with the relevant agencies an adequate network of fire hydrants, water tanks and related equipment on the Upper Rock.

23.2 Emphasise the use of potable water to extinguish fires within the Nature Reserve.

23.3 Insist on the establishment of an annual firebreak maintenance programme, which could operate in conjunction and collaborate with the proposed environmental maintenance and habitat management bodies.

23.4 Seek the cooperation and services of the 'INFOCA' fire-fighting hydroplanes from the 'Agencia de Medio Ambiente de Cádiz' in the event of a catastrophic fire.

24) Seek the establishment of a permanent police presence, e.g., Wildlife Liaison Officer, patrols and Warden facilities to monitor and establish the enforcement of the 'Nature Protection Ordinance, 1991'.

24.1 Implementation of the post of 'Warden' as stipulated in the 'Nature Protection Ordinance, 1991' (L/N 11).

24.2 Establishment of a permanent police presence on the Nature Reserve, together with regular patrols both day and night.

24.3 Active participation from the law enforcement authorities, Wardens, implementing agencies, environmental organisations, tour operators and members of the public to foster good environmental behaviour and ensure the nature protection laws are upheld.

25) The establishment of a Biological Reserve in the enclosed area known as Rock Gun and Middle Hill.

25.1 Establish the Biological Reserve, as an area restricted to the public, where the development of scientific research will not be tainted by visitor pressure or interaction.

25.2 Establish an administrative body of scientists to manage the Biological Reserve for the purpose of research into Gibraltar's fauna and flora and for containing and maintaining populations of Gibraltar's endangered species of wildlife, with the intention of re-introduction to other areas of the Upper Rock Nature Reserve.

25.3 Promote local and international scholars to participate in the research of the fauna and flora within the Biological Reserve and continue to encourage primate researchers with their on-going studies into the macaques.

25.4 Establish the proposed introduction programme of Spanish ibex and/or Barbary sheep, and roe deer within the Biological Reserve, as discussed in 6.2.

² A unit from 'Master Services' commenced removal of refuse from cliffs in the summer of 2003.

25.5 Authorise small, guided groups of visitors to the Biological Reserve only under strict supervision, preferably by the Warden who would be able to inform on the work being carried out there.

25.6 Continue the collaboration of researchers with GONHS, and the use of GONHS' Research facilities at Bruce's Farm.



Courtesy Gibraltar Tourist Board

References

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24. Action Plan

24. Action Plan

The Upper Rock Nature Reserve has largely been allowed to fall into a state of neglect. Since the actions required to improve the Reserve and raise this to the level of most Western European Nature Reserves and Tourist Sites are numerous and expensive, we have divided actions into three main categories according to their level of priority. These are given below.

- Red** = High Priority
Blue = Medium Priority
Green = Low Priority

The cost of carrying out all of the actions costed below is an estimated £363,755, plus £250,000 *per annum* (based on approximate estimates for 2004). It would be unrealistic (but nevertheless highly desirable) to carry out all of these actions in a year, from the point of view of both financial and workforce constraints. Therefore, those given a high priority should be acted upon first. Actions with a lower level of priority should not be neglected, but tackled as soon as high priority actions have been carried out.

1. Legislation

This section includes some proposed amendments to the 'Nature Conservation Area (Upper Rock) Designation Order'. The legal draftsman involved in making these amendments should work in close consultation with the GONHS to ensure that the resulting legislation is satisfactory.

Table 1.

Action	Requirement	Cost (£)
1.1.	The establishment of a team of a minimum of six Wardens	15000 p.a., p.p.
1.2.	Ongoing programme for the eradication of feral cats within the Nature Reserve	tackled by 1.1.
1.3.	Eradication of feral goats	subject to method
1.4.	Removal of chicken runs and poultry within the Nature Reserve	removed by owners

- 1.5. Legislation to be drafted to state that money generated through admission is to be spent on the Nature Reserve, and exactly how this money is to be spent on the Upper Rock. Some of these funds must go towards the conservation of the Reserve's natural history and heritage.
- 1.6. The management of the Nature Reserve to be the responsibility of the Ministry for the Environment. The Ministry for Tourism and Leisure to be responsible only for the management of the tourist sites, namely St. Michael's Cave, O'Hara's Battery, the Upper Galleries, Princess Caroline's Battery, the 'City Under Siege' exhibition and the Moorish Castle.
- 1.7. Amendment of the Designation Order to include a section or sub-section on obstruction of roads by cars, particularly taxis and coaches (at places such as St. Michael's Cave and Prince Phillip's Arch).
- 1.8. Proper enforcement of the law to reduce the excessive use of horns and loud music by vehicles.
- 1.9. Restriction of all traffic on upper roads (i.e., beyond St. Michael's Cave), unless the reason for use is consistent with wildlife conservation aims, Nature Reserve staff requirements or emergency and essential vehicular use.
- 1.10. Residents of the Upper Rock Nature Reserve to be issued with a disc that is to be displayed on windscreens, authorising access through Willis's Road after closing time.
- 1.11. Amendment of Designation Order to stipulate new closing and opening times, and set these at 07:00hrs and 22:00hrs during the change to summer time at GMT+2 and set at 07:00hrs and 20:00hrs during the change to wintertime at GMT +1. Opening and closing times to be known as the 'specified time'.
- 1.12. Barrier at the Moorish Castle to remain down after the specified time. Access to be granted only if the driver of the vehicle requesting entry is a resident with a valid Upper Rock Nature Reserve disc, or guest of the same and produces proof of permission or identity and specifies location or residence where he/she will be visiting. In this last case, visitors are only to be allowed to proceed after the Security Guard confirms destination via a phone call to the residence in question. In addition, persons may be granted permission if access is compatible with the needs/aims of the Nature Reserve. In this case, documentary evidence must be produced.
- 1.13. No person without permission to remain within the Nature Reserve after the specified time.
- 1.14. Gates at Engineer Road and Lathbury Barracks to be closed at the specified time.

- 1.15. Amendment of Designation order to stipulate that tour operators be held responsible for the actions of their clients in relation to macaques and litter.
- 1.16. No building or structure to be erected within the Upper Rock, without prior approval from the Board of Management, and then only for the purposes of the administration and conservation of the Nature Reserve, or the enhancement of existing and future tourist sites.
- 1.17. Section 6.(1) of the Designation Order to be amended to include the phrase, '...except with the prior written consent of the Authority, *in consultation with the Nature Conservancy Council...*'
- 1.18. Policies within 'The Gibraltar Development Plan' pertaining to the integrity of the Upper Rock as a Nature Reserve to be included within the 'Nature Conservation Area (Upper Rock) Designation Order'.
- 1.19. Designation Order to be amended to include a detailed account of the Wardens' authority.
- 1.20. Designation Order to be amended to replace the term 'Wild Life Warden' with 'Wildlife Warden'.
- 1.21. All sections or sub-sections of the Designation Order which do not already do so to be amended to include the words '...after consultation with the Nature Conservancy Council,' when a decision is to be made by the Governor.
- 1.22. Restriction on access to caves holding roosting and/or breeding bats. Access to be granted only by the Cave Management Committee.
- 1.23. Natural areas that are important as feeding sites for bats to be protected in accordance with Council Directive 92/43/EEC. This to include sites outside the Nature Reserve boundary.
- 1.24. Amendment of section 5.1 of the Designation Order to prohibit the feeding of exotic and/or introduced species within the Nature Reserve.
- 1.25. Amendment of the Designation Order, so that the term 'wild animal' be replaced by the terms 'indigenous fauna' and 'introduced fauna'.
- 1.26. Residents who keep pets within the Nature Reserve to apply and obtain a valid licence for these pets, in accordance with the Designation Order.
- 1.27. Designation Order to be amended to include a 'buffer zone' around the boundary of the Nature Reserve.
- 1.28. Legislation to be drafted to control what animals or plants are kept in peripheral areas to the Nature Reserve.
- 1.29. Designation Order to be amended to include the total prohibition on possession and/or use of pesticides, herbicides and fungicides within the Upper Rock Nature Reserve, unless under licence.

2. The Face of the Upper Rock Nature Reserve

Table 2.

Action	Requirement	Cost (£)
2.1.	Thorough enforcement of litter-control laws	tackled by police and 1.1.
2.2.	Contract for clearing of litter throughout areas of the Nature Reserve that are not currently cleared.	12000 p.a.
2.3.	Litter-control signs	1500
2.4.	CCTV cameras at frequently vandalised sites	30000
2.5.	Macaque-proof bins to replace current bins	10000
2.6.	Eradication of all graffiti, and consequent maintenance	tackled by 9.1.
2.7.	Annual clearing of roadsides, carried out as specified by GONHS.	tackled by 9.1.
2.8.	Disused pipes and ancillary equipment to be removed	tackled by 9.1.
2.9.	Signposts and information panels	some currently being developed using Management Plan budget, + 15000
2.10.	Clearing of boulders and rubble on paths	MOD community project
2.11.	Structural damage to paths and steps to be repaired	assessment by M.E.R.U.
2.12.	Erection and maintenance of handrails along more dangerous sections of paths and steps	assessment by M.E.R.U.
2.13.	Repair and maintenance of heritage sites along paths	assessment by GoG Conservation Officer

Action	Requirement	Cost (£)
2.14.	Clearing of vegetation along paths	tackled by 9.1.
2.15.	Removal of dead trees lying across paths	tackled by 9.1.
2.16.	Replacement of sewerage system along Martin's Path	assessment by M.E.R.U.
2.17.	Development and production of pamphlet or booklet for pedestrian use of the Nature Reserve, indicating routes of interest	being developed using Management Plan budget
2.18.	Relocation of kennel at Princess Caroline's Battery	provision of alternative site by GoG
2.19.	Military aerials, cables and pipelines to be removed by the MOD on release of land to Government of Gibraltar	to be borne by proprietors, i.e., MOD
2.20.	Relocation of existing cables that remain in use, to increase attractiveness of firebreaks and roadsides	to be borne by proprietors, i.e., MOD
2.21.	Railings along roadside to be replaced by more attractive railings	60000
2.22.	Garage at Jews' Gate to be relocated	provision of alternative site by GoG
2.23.	Replacement of monument at Jews' Gate. Pending recommendations	undetermined
2.24.	Fence that surrounds Scout camp at GLO to be replaced	2900
2.25.	Picnic sites to be created at Governor's Lookout and Princess Caroline's Battery. Benches, tables and monkey-proof bins to be installed, vegetation to be cleared, etc.	2500

3. Transport, Traffic & Tourism

Table 3.

Action	Requirement	Cost (£)
3.1.	Repair subsidence, Cave Branch Road, Signal Station Road and any other area where structural damage has occurred	assessment by M.E.R.U.
3.2.	Establishment of an annual road repairs and maintenance programme	no cost
3.3.	Straightening of bend on Engineer's Road	assessment by M.E.R.U.
3.4.	Provision of paved areas along roadways for pedestrians where possible	assessment by M.E.R.U.
3.5.	Improvement and addition of road and site signs	3000
3.6.	Increase concessionary rate to £4	no cost
3.7.	Reduce the private tourist rate to £6	no cost
3.8.	Redirection of traffic through Great North Road	assessment by M.E.R.U.
3.9.	Promotion of environmentally friendly mode of transport	2000
3.10.	All tour operators to operate their vehicles on Biodiesel	responsibility of GoG and tour operators

4. Introduced Flora

Table 4. Action is required to remove the following species.

Action	Species	Manpower	Duration (weeks)	Cost (£)
4.1.	<i>Senecio angulatus</i>	10	12	24000
4.2.	<i>Chasmanthe floribunda</i>	6	2	tackled by 9.1.
4.3.	<i>Lantana camara</i>	2	1	tackled by 9.1.
4.4.	<i>Opuntia ficus-indica</i>	3	24	14000
4.5.	<i>Carpobrotus acinaciformis x edulis</i>	2	1	tackled by 9.1.
4.6.	<i>Ailanthus altissima</i>	3	3	tackled by 9.1.
4.7.	<i>Agave americana</i>	3	1	tackled by 9.1.

- 4.8. Amendment of 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993) to include a ban on the growing or keeping of the following plants by residents:

- *Pennisetum clandestinum* Chiov. ex. Hochst.
- *Senecio angulatus* de Candolle
- *Chasmanthe floribunda* (Salisbury) Brown
- *Ailanthus altissima* (Miller) Swingle
- *Carpobrotus acinaciformis* (L.) Bolus
- *Carpobrotus acinaciformis x edulis*
- *Carpobrotus edulis* (L.) N.E. Br.
- *Opuntia ficus-indica* (L.) Miller
- *Lantana camara* L.

...plus any other that are deemed to be potential invasives by the Nature Conservancy Council.

5. Fire & Firebreaks

Table 5.

Action	Requirement	Cost (£)
5.1.	Continuation of current clearing of firebreaks	no added cost
5.2.	Annual clearing of Bruce's Farm & Aerial Farm firebreaks	20000 p.a.
5.3.	New fire hazard signs to be erected	1500
5.4.	Damaged water tanks to be replaced by fibreglass tanks	assessment by City Fire Brigade
5.5.	Number of water hydrants to be increased	assessment by City Fire Brigade

6. Heritage

Table 6.

Action	Requirement	Cost (£)
6.1.	Vegetation around Moorish wall to be cleared, 30m on either side	tackled by 9.1.
6.2.	Historical graffiti at 'Moorish' wall to be protected with perspex sheet	300
6.3.	Restoration of Charles V Wall, particularly steps and railings	assessment by M.E.R.U.
6.4.	Removal of tall vegetation to the south of Charles V Wall	tackled by 9.1.
6.5.	Provision of sanitary facilities at Princess Caroline's Battery	assessment by G.T.B.
6.6.	Batteries, gun emplacements and other WWII structures to be refurbished	assessment by GoG Conservation Officer
6.7.	Information panel at disused water catchment on Engineer Road	1000

7. Mammals

Table 7.

Action	Requirement	Cost (£)
7.1.	Monitoring of bat populations	tackled by 1.1.
7.2.	Erection of grilles and fences to protect bat caves	4000
7.3.	Replenish depleting rabbit population using wild stock from Spain	no cost
7.4.	Reintroduction of red fox	no cost
7.5.	Introduction of Spanish ibex and/or Barbary sheep	2000
7.6.	Introduction of roe deer	being investigated

8. Birds

Table 8.

Action	Requirement	Cost (£)
8.1.	Control of feral pigeon	extension of GONHS Gull Cull licence
8.2.	Monitoring of lesser kestrel population	tackled by 1.1.
8.3.	Replenishing of lesser kestrel population	2000
8.4.	Reintroduction of black wheatear	no cost

9. Habitats

- 9.1. A team of 10-12 persons to be employed to tackle every aspect of habitat management within the Nature Reserve. This is to include habitat management, the clearing of road-sides and disused water catchments, the control and eradication of exotic flora and replanting programmes. This team can also tackle other aspects of Nature Reserve management, such as the clearing of pathways, clearing of rubbish in habitats (including caves), etc. The team is to be trained and supervised by GONHS personnel.

Cost: £13000 p.a., p.p.

Table 9.

Action	Requirement	Cost (£)
9.2.	Control of <i>Acanthus mollis</i>	tackled by 9.1.
9.3.	Removal of woody vegetation on Rock Gun water catchment	tackled by 9.1.
9.4.	Planting programme at woodland sites using Mediterranean tree species	tackled by 9.1.
9.5.	All cliffs surrounding the Nature Reserve to be included within revised boundary	no cost
9.6.	All cliffs to be included as SACs under the EU Habitats Directive	no cost
9.7.	Removal of woody shrubs in garigue habitats	tackled by 9.1.

10. Research and Monitoring

Table 10.

Action	Requirements	Cost (£)
10.1.	Designation of Rock Gun and Middle Hill as a Biological Reserve	no cost
10.2.	Establishment of a management body for the Biological Reserve	no cost
10.3.	Watering site to be established for introduced herbivores	5000
10.4.	Monitoring programme recommended in Chapter 17.10	tackled by 1.1.
10.4.	Establishment of Environmental education programmes for schools	see Chapter 17.10

11. Tourist Sites

Table 11.1. Jews' Gate

Action	Requirements	Cost (£)
11.1.	Bollards to be replaced with a visible barrier	300
11.2.	Water drinking fountain to be connected to the mains	200
11.3.	Water pressure for drinking fountain and toilets to be increased	to be investigated by G.T.B.
11.4.	Telescope to be replaced	4055

Table 11.2. St. Michael's Cave

Action	Requirements	Cost (£)
11.5.	Resurfacing of the road leading down to New St. Michael's Cave	assessment by M.E.R.U.
11.6.	Porta-cabin to be removed and ticket office to be extended	8000
11.7.	Implementation of Tour guides in the Cave	to be assessed by G.T.B.
11.8.	Regular, environmentally friendly vermin control	Environmental Agency, no additional cost

Table 11.3. Ape's Den

Action	Requirements	Cost (£)
11.9.	Adequate sign at the top of Lower Queen's Road indicating 'Ape's Den'	covered by 3.5.
11.10.	Complete refurbishment of this site	30000
11.11.	Provision of an interpretation centre	9000
11.12.	Establishment of a quality souvenir shop	to be negotiated

Table 11.4. Upper Galleries

Action	Requirements	Cost (£)
11.13.	Construction of large new terrace	assessment by M.E.R.U.
11.14.	Connect the Upper to the Middle Galleries via a lift or spiral staircase	assessment by G.T.B.

Table 11.5. City Under Siege

Action	Requirements	Cost (£)
11.15.	Parking facilities for the site at Waterworks entrance	assessment by M.E.R.U.
11.16.	Provision of path from parking facilities to the site	assessment by M.E.R.U.
11.17.	Enlargement of ticket office	9000
11.18.	Toilet facilities for this site to be located at the Waterworks entrance	assessment by G.T.B.
11.19.	Habitat management of the area around the site	tackled by 9.1.

Table 11.6. Moorish Castle

Action	Requirements	Cost (£)
11.20.	Parking facilities for the site at Waterworks entrance	see 11.16.
11.21.	Establishment of a quality souvenir shop for this site and the above	to be negotiated
11.22.	Habitat management and clearing of vegetation around the Castle walls	tackled by 9.1.

Table 11.7. Cable Car Top Station

Action	Requirements	Cost (£)
11.23.	Replacement of telescopes	borne by M.H. Bland Ltd.
11.24.	Information panels	borne by M.H. Bland Ltd.

Table 11.8. South of Cable Car Top Station

Action	Requirements	Cost (£)
11.25.	Complete refurbishment	20000
11.26.	Development into an exhibition of the WWII installations	30000
11.27.	Clearing of refuse on the east cliffs	to be tackled by Master Services

12. Pine Trees

Table 12.

Action	Requirements	Cost (£)
12.1.	Dead pine trees to be felled	tackled by 9.1.
12.2.	Dead pine trees to be replaced with live trees	500, tackled by 9.1.
12.3.	Additional pine trees to be planted in suitable areas	500, tackled by 9.1.
12.4.	<i>Pinus halepensis</i> to be favoured in any replanting programme	no cost

13. Geology and Caves

Table 13.

Action	Requirements	Cost (£)
13.1.	Cleaning of all refuse and debris in caves	tackled by 9.1.
13.2.	Restriction of access to Martin's Cave	tackled by 7.2.
13.3.	Information panels outside key caves	3000
13.4.	Removal of obsolete cables and ancillary equipment in caves	MOD community project
13.5.	Bray's cave to be made safe	borne by Gibraltar Museum
13.6.	Establishment of Cave Management Committee	no cost

14. The Lower Slopes

Table 14.

Action	Requirements	Cost (£)
14.1.	Inclusion of all orchid species under Schedule 3 of Nature Protection Ordinance	no cost
14.2.	Habitat management	tackled by 9.1.
14.3.	Extension of Nature Reserve boundary to include Lower Slopes	no cost

15. European Wildlife Directives

- 15.1. Designation of Upper Rock Nature Reserve as an SAC under the EU Habitats Directive.
- 15.2. Preparation of an action plan for the conservation of lesser kestrels in Gibraltar. Currently being prepared by GONHS.

Table 15.

15.3. - summary of cost of financing Habitats Directive requirements

Habitat	Action	Cost (£)
<i>Vegetated Sea Cliffs</i>	Site supervision	tackled by 1.1.
<i>Matorral with Laurus</i>	Initial cost (non-recurring)	
	Habitat/site restoration	none required
	Clearing of rubbish/debris	tackled by 9.1.
	Recurrent expenditure (p.a.)	
	Habitat management	none required
	Site supervision	tackled by 1.1.
<i>Thermo-mediterranean and Presteppe Brush</i>	Initial cost (non-recurring)	
	Habitat/site restoration, Rock Gun area	30000
	Recurrent expenditure (p.a.)	
	Habitat management	tackled by 9.1.
	Site supervision	tackled by 1.1.
<i>Chasmophytic vegetation</i>	Initial cost (non-recurring)	
	Surveying of site and remedial action	10000
	Recurrent expenditure (p.a.)	
	Habitat management	none
	Site supervision	tackled by 1.1.

CONTINUE>>

Habitat	Action	Cost (£)
Caves	Initial cost (non-recurring)	
	Habitat/site restoration	tackled by 13.1.
	Protection of caves	tackled by 7.2.
	Recurrent expenditure (p.a.)	
	Monitoring/Supervision/Conservation	tackled by 1.1.
Total	Capital	Recurrent
Annual	£40,000.00*	£0.00*
Grand Total		£40,000.00*

* Provided arrangements described in 1.1., 7.2., 9.1. & 13.1. have already been implemented.

16. Barbary macaques

Many of the actions required for Barbary macaques are covered in previous sections. This is the case, for example, with illegal feeding, maintenance and refurbishment of sites, restriction of access to at least one pack and traffic restrictions along the Upper Roads. In addition, those requirements that have not yet been covered are listed in table 16.

Table 16.

Action	Requirements	Cost (£)
16.1.	Importation of macaques from North Africa to replenish local genetic stock	10000
16.2.	Exportation of macaques to North Africa in order to replenish genetic stock of small populations and to repopulate sites where the species has disappeared	20000
16.3.	Exportation of macaques to Zoological parks to be favoured over culling	Cost depends on demand

17. Works Programme for 9.1.

Table 17. Works programme for the 9.1. team. Actions have been categorised according to the frequency with which works need to be carried out.

Action	Once	Every Year	Every 2 Years	Every 5 Years	Every 10 Years
2.6.		•			
2.7.		•			
2.8.	•				
2.14.			•		
2.15.	•				
4.2.	•				
4.3.	•				
4.5.	•				
4.6.	•				
4.7.	•				
6.1.				•	
6.4.				•	
9.2.		•			
9.3.					•
9.4.	•				
9.7.				•	
11.21.				•	
11.25.				•	
12.1.	•				
12.2.	•				
12.3.	•				
13.1.			•		
14.2.				•	
15.3.		•			

It is evident when looking through the action plan that the workload for the team of 10-12 individuals appointed under action 9.1. is considerable. However, whereas some of these jobs must be tackled on a regular basis, others require only one action. Table 16 shows the frequency with which each action must be addressed.

Some of the problems listed under 'Once' may recur. These should be tackled as and when required. New dead trees may occasionally fall across paths, and likewise, pines along roadsides may occasionally die. However, this is the exception rather than the norm, and the workforce will only have to tackle these small tasks as and when they occur (i.e., very rarely). The removal of exotic invasives will likewise require only one action. Obviously, if these species re-establish themselves within the Reserve, or if any new exotic invasives appear, then these problems will have to be tackled anew. However, this will only occur sporadically, and tackling a new invasive species is a simple task as long as the problem is identified and tackled promptly before the plant has had a chance to spread. Tree planting programmes are also listed under this column. Such a programme could be ongoing, but providing that enough healthy saplings take root, each area tackled will only have to be addressed once.

Actions that need to be addressed frequently include litter problems outside of the areas tackled by Master Services (specifically within caves and habitats) and graffiti. Unfortunately, these are problems that will surface year after year, and so permanent vigilance and action is required. It is significant to note that tighter enforcement of laws and the presence of wardens may reduce these problems considerably. This would therefore reduce the workload of the 9.1. team.

Some of the actions listed in table 17 require the clearing of vegetation, in particular woody vegetation. In open areas such as the disused water catchment at Rock Gun, the introduction of large herbivores would go some way towards controlling woody vegetation permanently. Such an action would therefore reduce the team's workload considerably. Large herbivores could also be introduced to some of the large firebreaks towards the Northern end of the Rock.

The problematic plant *Acanthus mollis* must be tackled annually. This does not mean that the whole of the Upper Rock must be denuded of this plant every single year. This would not be a feasible task. Rather, different areas could be tackled in different years, and some areas may require more attention than others. Such areas include firebreaks and paths, which will, in any case, be tackled regularly. When these areas are being cleared, special attention must be given to the removal of *Acanthus mollis*. The careful, licensed use of a paraquat herbicide such as 0.5% or 1% glyphosphate or Dalapon, could eliminate this plant from areas where it causes the gravest problems.

Appendix 1: Species Lists

2.1 Vascular Plants

The following plants are found within the Upper Rock and the Lower Slopes, and are listed alphabetically rather than taxonomically, as given by Linares (2003). Those highlighted with an * are not native.

<i>Acanthus mollis</i>	<i>Campanula rapunculus</i>	<i>Erodium moschatum</i>
<i>Achyranthes sicula</i>	<i>Campanula velutina</i>	<i>Eucalyptus camaldulensis*</i>
<i>Aetheorhiza bulbosa</i>	<i>Cardamine hirsute</i>	<i>Eucalyptus globulus*</i>
<i>Agave americana*</i>	<i>Carduus pycnocephalus</i>	<i>Euphorbia characias</i>
<i>Ailanthus altissima*</i>	<i>Carduus tenuiflorus</i>	<i>Euphorbia exigua</i>
<i>Ajuga iva</i>	<i>Carex hallerana</i>	<i>Euphorbia helioscopia</i>
<i>Allium ampeloprasum</i>	<i>Carlina corymbosa</i>	<i>Euphorbia segetalis</i>
<i>Allium pallens pallens</i>	<i>Carpobrotus acinaciformis x edulis*</i>	<i>Euphorbia squamigera</i>
<i>Allium sphaerocephalon</i>	<i>Carthamus arborescens</i>	<i>Fedia cornucopiae</i>
<i>Allium triquetrum</i>	<i>Carthamus lanatus</i>	<i>Ferula tingitana</i>
<i>Aloe arborescens*</i>	<i>Celtis australis</i>	<i>Ficus carica</i>
<i>Anacamptis pyramidalis</i>	<i>Centaurea melitensis</i>	<i>Filago pyramidata</i>
<i>Anacyclus radiatus</i>	<i>Centaurea pullata</i>	<i>Foeniculum vulgare</i>
<i>Anagallis arvensis</i>	<i>Centaurium erythraea</i>	<i>Freesia refracta*</i>
<i>Anagyris foetida</i>	<i>Centaurium pulchellum</i>	<i>Fumaria capreolata</i>
<i>Andryala integrifolia</i>	<i>Centranthus clacitrapae</i>	<i>Fumaria sepium</i>
<i>Anogramma leptophylla</i>	<i>Centranthus ruber</i>	<i>Galactites tomentosa</i>
<i>Anthyllis tetraphylla</i>	<i>Cerastium gibraltarcum</i>	<i>Galium murale</i>
<i>Antirrhinum majus</i>	<i>Cerastium glomeratum</i>	<i>Galium verrucosum</i>
<i>Arenaria leptoclados</i>	<i>Ceratonia siliqua</i>	<i>Genista linifolia</i>
<i>Arisarum simorrhinum</i>	<i>Ceterach officinarum</i>	<i>Gennaria diphylla</i>
<i>Aristolochia baetica</i>	<i>Chaenorrhinum villosum</i>	<i>Geranium molle</i>
<i>Arum italicum</i>	<i>Chamaerops humilis</i>	<i>Geranium purpureum</i>
<i>Asparagus albus</i>	<i>Chasmanthe floribunda*</i>	<i>Geranium rotundifolium</i>
<i>Asparagus aphyllus</i>	<i>Cheilanthes vellea</i>	<i>Gladiolus communis</i>
<i>Asphodelus aestivus</i>	<i>Chenopodium album</i>	<i>Gynandris sisyrinchium</i>
<i>Asphodelus albus</i>	<i>Chenopodium ambrosioides</i>	<i>Hedypnois arenaria</i>
<i>Asphodelus fistulosus</i>	<i>Chenopodium murale</i>	<i>Hedypnois cretica</i>
<i>Asplenium billotii</i>	<i>Chrysanthemum coronarium</i>	<i>Helianthemum origanifolium</i>
<i>Asplenium onopteris</i>	<i>Cistus albidus</i>	<i>Helichrysum rupestre</i>
<i>Asplenium trichomanes</i>	<i>Cistus salvifolius</i>	<i>Hippocrepis multisiliquosa</i>
<i>Aster squamatus</i>	<i>Clematis cirrhosa</i>	<i>Hirschfeldia incana</i>
<i>Asteriscus acuaticus</i>	<i>Clematis flammula</i>	<i>Hordeum leporinum</i>
<i>Asteriscus maritimus</i>	<i>Colchicum lusitanum</i>	<i>Hyoseris radiata</i>
<i>Astragalus baeticus</i>	<i>Convolvulus althaeoides</i>	<i>Hyparrhenia hirta</i>
<i>Astragalus hamosus</i>	<i>Convolvulus siculus</i>	<i>Hypericum perforatum</i>
<i>Atractylis cancellata</i>	<i>Conyza albida*</i>	<i>Iberis gibraltarcica</i>
<i>Atriplex halimus</i>	<i>Conyza bonariensis*</i>	<i>Iris albicans*</i>
<i>Avena barbata</i>	<i>Coronilla valentina</i>	<i>Iris filifolia</i>
<i>Avena sterilis</i>	<i>Crataegus monogyna</i>	<i>Jasminum fruticans</i>
<i>Avenula gervaisii</i>	<i>Crepis capillaries</i>	<i>Kundmannia sicula</i>
<i>Bellardia trixago</i>	<i>Crepis vesicaria</i>	<i>Lactuca tenerrima</i>
<i>Bellis sylvestris</i>	<i>Cuscuta planiflora</i>	<i>Lagurus ovatus</i>
<i>Beta vulgaris</i>	<i>Cymbalaria muralis</i>	<i>Lantana camara*</i>
<i>Biscutella megacarpaea</i>	<i>Cynara humilis</i>	<i>Lathyrus amphicarpos</i>
<i>Biscutella sempervirens</i>	<i>Dactylis glomerata</i>	<i>Lathyrus clymenum</i>
<i>Blackstonia perfoliata</i>	<i>Daphne gnidium</i>	<i>Lathyrus setifolius</i>
<i>Borago officinalis</i>	<i>Daucus carota</i>	<i>Laurus nobilis</i>
<i>Brachypodium distachyon</i>	<i>Delphinium pentagynum</i>	<i>Lavandula dentata</i>
<i>Brachypodium retusum</i>	<i>Desmazeria rigida</i>	<i>Lavandula multifida</i>
<i>Briza maxima</i>	<i>Dianthus carophyllus</i>	<i>Lavatera arborea</i>
<i>Bromus diandrus</i>	<i>Dittrichia viscosa</i>	<i>Lavatera cretica</i>
<i>Bromus hordeaceus</i>	<i>Dracaena draco*</i>	<i>Leontodon longirrostris</i>
<i>Bromus madritensis</i>	<i>Ecballium elaterium</i>	<i>Leucojum autumnale</i>
<i>Bromus rigidus</i>	<i>Echium boissieri</i>	<i>Linaria amethystea</i>
<i>Bupleurum fruticosum</i>	<i>Echium creticum</i>	<i>Linaria tristis</i>
<i>Calamintha sylvatica</i>	<i>Echium plantagineum</i>	<i>Linum bienne</i>
<i>Calamintha arvensis</i>	<i>Elaeoselinum foetidum</i>	<i>Linum strictum</i>
<i>Calendula suffruticosa</i>	<i>Ephedra fragilis</i>	<i>Lobularia maritima</i>
<i>Calicotome villosa</i>	<i>Erodium chium</i>	<i>Logfia gallica</i>
<i>Campanula erinus</i>	<i>Erodium malacoides</i>	<i>Lolium rigidum</i>

<i>Lonicera implexa</i>	<i>Phagnalon saxatile</i>	<i>Sideritis arborescens</i>
<i>Lotus arenarius</i>	<i>Phalaris canariensis</i>	<i>Silene colorata</i>
<i>Lotus collinus</i>	<i>Phillyrea latifolia</i>	<i>Silene gallica</i>
<i>Lotus edulis</i>	<i>Phlomis purpurea</i>	<i>Silene latifolia</i>
<i>Lotus ornithopodioides</i>	<i>Pinus halepensis*</i>	<i>Silene nocturna</i>
<i>Magydaris panacifolia</i>	<i>Pinus pinea*</i>	<i>Silene tomentosa</i>
<i>Malva hispanica</i>	<i>Piptatherum caeruleum</i>	<i>Smilax aspera</i>
<i>Medicago minima</i>	<i>Piptatherum miliaceum</i>	<i>Smyrniolum olusatrum</i>
<i>Medicago orbicularis</i>	<i>Pistacia lentiscus</i>	<i>Solanum alatum</i>
<i>Medicago polymorpha</i>	<i>Pistacia terebinthus</i>	<i>Solanum sodomium*</i>
<i>Medicago tornata</i>	<i>Pisum sativum</i>	<i>Solanum villosum</i>
<i>Medicago truncatula</i>	<i>Plumbago auriculata*</i>	<i>Sonchus asper</i>
<i>Melica arrecta</i>	<i>Plantago afra</i>	<i>Sonchus oleraceus</i>
<i>Melica magnolii</i>	<i>Plantago coronopus</i>	<i>Sonchus tenerrimus</i>
<i>Melica minuta</i>	<i>Plantago lagopus</i>	<i>Spartium junceum</i>
<i>Mellilotus indica</i>	<i>Poa infirma</i>	<i>Spiranthes spiralis</i>
<i>Mellilotus sulcata</i>	<i>Polycarpon tetraphyllum</i>	<i>Stachys circinata</i>
<i>Mercurialis annua</i>	<i>Polygala rupestris</i>	<i>Stellaria media</i>
<i>Micromeria graeca</i>	<i>Polypodium cambricum</i>	<i>Stellaria pallida</i>
<i>Minuartia geniculata</i>	<i>Prasium majus</i>	<i>Stipa tenacissima</i>
<i>Minuartia hybrida</i>	<i>Psoralea bituminosa</i>	<i>Stipa capensis</i>
<i>Misopates orontium</i>	<i>Pulicaria odora</i>	<i>Succowia balearica</i>
<i>Muscari comosum</i>	<i>Quercus coccifera</i>	<i>Tamus communis</i>
<i>Narcissus papyraceus</i>	<i>Ranunculus bullatus</i>	<i>Tecoma capensis*</i>
<i>Nepeta tuberosa</i>	<i>Ranunculus paludosus</i>	<i>Teucrium fruticans</i>
<i>Nicotiana glauca*</i>	<i>Raphanus raphanistrum</i>	<i>Teucrium lusitanicum</i>
<i>Olea europea</i>	<i>Rapistrum rugosum</i>	<i>Thapsia villosa</i>
<i>Ononis pubescens</i>	<i>Reichardia intermedia</i>	<i>Theligonum cynocrambe</i>
<i>Ononis reclinata</i>	<i>Reseda alba</i>	<i>Thesium humile</i>
<i>Ononis viscosa</i>	<i>Rhamnus alaternus</i>	<i>Thymus wilddenowii</i>
<i>Ophrys apifera</i>	<i>Rhamnus lycioides</i>	<i>Trifolium campestre</i>
<i>Ophrys bombyliflora</i>	<i>Romulea clusiana</i>	<i>Trifolium glomeratum</i>
<i>Ophrys fusca</i>	<i>Rosmarinus officinalis</i>	<i>Trifolium scabrum</i>
<i>Ophrys lutea</i>	<i>Rostraria cristata</i>	<i>Trifolium stellatum</i>
<i>Ophrys speculum</i>	<i>Rubia peregrina</i>	<i>Trifolium tomentosum</i>
<i>Ophrys tenthredinifera</i>	<i>Rumex intermedius</i>	<i>Trisetaria panicea</i>
<i>Opuntia ficus-indica*</i>	<i>Ruscus hypophyllum</i>	<i>Tropaeolum majus*</i>
<i>Opuntia vulgaris*</i>	<i>Ruta angustifolia</i>	<i>Umbilicus horizontalis</i>
<i>Ornithogalum orthophyllum</i>	<i>Sagina apetala</i>	<i>Umbilicus rupestris</i>
<i>Orobanchaceae amethystea</i>	<i>Sanguisorba minor</i>	<i>Urginea maritima</i>
<i>Orobanchaceae crenata</i>	<i>Saxifraga globulifera</i>	<i>Urospermum picroides</i>
<i>Orobanchaceae minor</i>	<i>Scabiosa atropurpurea</i>	<i>Urtica membranacea</i>
<i>Orobanchaceae ramosa</i>	<i>Scandix pecten-veneris</i>	<i>Valantia hispida</i>
<i>Orobanchaceae sanguinea</i>	<i>Scilla autumnalis</i>	<i>Valantia muralis</i>
<i>Osyris quadripartita</i>	<i>Scilla peruviana</i>	<i>Verbascum sinuatum</i>
<i>Oxalis pes-caprae*</i>	<i>Scorpiurus muricatus</i>	<i>Veronica arvensis</i>
<i>Pallenis spinosa</i>	<i>Sedum album</i>	<i>Veronica cymbalaria</i>
<i>Parentucellia viscosa</i>	<i>Sedum rubens</i>	<i>Vicia benghalensis</i>
<i>Parietaria judaica</i>	<i>Sedum sediforme</i>	<i>Vicia lutea</i>
<i>Parietaria lusitanica</i>	<i>Selaginella denticulata</i>	<i>Vicia sativa</i>
<i>Parietaria mauretanicum</i>	<i>Senecio angulatus*</i>	<i>Vicia villosa</i>
<i>Paronychia argentea</i>	<i>Senecio vulgaris</i>	<i>Vinca difformis</i>
<i>Pelargonium inquinans*</i>	<i>Serapias parviflora</i>	<i>Vulpia ciliata</i>
<i>Peterorhagia nanteuilii</i>	<i>Sherardia arvensis</i>	<i>Vulpia geniculata</i>
<i>Petroselinum crispum</i>		

Report on Rare and Special Plants: by Leslie Linares

Gibraltar chickweed *Cerastium gibraltarium* Boiss.

This plant is believed endemic to Gibraltar, and used to be more common than at present. In the past it has been found in the Rock Gun /Green's Lodge Road area; along the ridge above and along Douglas Path; on and below the ridge from Signal Hill to the lookout at the start of Douglas Path; along Martin's Path; at the top of Mediterranean Steps. At present, the populations from Signal Hill to Douglas Path have disappeared. The reasons for this are not clear, but could be due to the increase in gull population altering the soil composition, and the increased activity of the monkeys in that area. The other populations are holding their own, though the ones along Martin's Path seem to be on the decline. One new population

was seen last year on the cliff face below Devil's Gap.

Gibraltar campion *Silene tomentosa* Otth. in DC.

This plant is endemic to Gibraltar and is extremely rare. It was believed extinct for over 100 years until a couple of plants were seen along Green's Lodge Road in 1979. The next sighting was in 1985, again along Green's Lodge Road and also at the entrance to the Galleries, when six plants were noted. The last sighting in the wild was of three plants in 1994, this time along Rock Gun Road. Plants have been successfully raised at the Alameda Gardens, from seeds collected from the last find, but attempts at re-introducing them to the wild have not met with great success. It is possible that plants may be growing on the more inaccessible parts of the Rock's northern and eastern cliffs.

Wild carnation *Dianthus caryophyllus* L.

This beautifully scented plant used to be quite common from the Rock Gun / Green's Lodge area, all along the upper ridge of the Rock, including from Signal Hill to Douglas Path, and also along Martin's Path. In the past 10 years or so, not a single plant has been seen growing anywhere along this route, though there may be some still growing in the restricted Rock Gun / Green's Lodge area. The disappearance of this species seems to go hand in hand with that of the Gibraltar Chickweed; these two species seemed to coincide in habitat.

Gibraltar saxifrage *Saxifraga globulifera* Desf. var. *gibraltarica* Ser.

This variety of *S. globulifera* is believed to be endemic to Gibraltar. It is a rare plant. Three populations have been observed: a small one at the top of Mediterranean Steps, another small one at the top of the road to the Galleries, and a larger one at Rock Gun. The plants at Med Steps and Rock Gun, seem to be faring reasonably well, but the ones near the Galleries are suffering the effects of the mindless scraping and clearing that the Upper Rock roadsides are subjected to. This population has dwindled from a healthy state to one of near extinction.

Gibraltar thyme *Thymus willdenowii* Boiss.

This species is believed to be a native of North Africa, but grows well in Gibraltar. It is quite widespread along the Upper Rock, growing from cracks on the limestone, and very commonly along roadsides and footpaths. Because of this, many plants are, again, being lost to the indiscriminate and over-enthusiastic clearing of roadsides. At present, this species is quite common, but its future could be in the balance.

Orchids

All species of the orchid family found in Gibraltar are rare. These species grow best on undisturbed soil, in unexposed clearings. On the Rock these conditions are met in rocky outcrops and clearings in the Maquis, on firebreaks, and along footpaths and roadsides. Clearings in the Maquis are few and far between; firebreaks are not being maintained regularly; and roadsides are continuously being disturbed. As a result of disturbance, and of loss and change of habitat, the number of orchids has suffered a serious decline over the last 15 years or so.

The most common species is the two-leaved Gennaria, *Gennaria diphylla* (Link) Parl.. This is quite common and widespread along footpaths and roadsides all along the Upper Rock. Next comes the autumn ladies tresses orchid, *Spiranthes spiralis* (L.) Chevall. This is also quite widespread, but not common. These are difficult to find, and usually grow in clearings and firebreaks. Then comes the small-flowered Serapias *Serapias parviflora* Parl.. This species is also quite widespread on the Upper Rock, but is rare. It grows best on clearings and along roadsides and footpaths. The brown bee orchid *Ophrys fusca* Link, and the yellow bee orchid *Ophrys lutea* (Gouan) Cav., are the two species of insect orchid which one is more likely to see on the Upper Rock, but their number has dropped so dramatically over the last 15 years or so, that only 5 or 6 of each are visible throughout the Upper Rock. In the past, the bulk of their number was to be found growing along most of the roadsides of the Reserve. Their decline can only be attributed to road clearing. The mirror orchid *Ophrys speculum* Link, has only been found on the lower slopes of the Upper Rock. Up to 40 plants were once counted in this area. At the last count, only 3 were seen. Here the problem is one of the once clear, open habitat (once kept clear by goats), now becoming more overgrown, and returning to Maquis. The bee orchid *Ophrys apifera* Hudson, is very rare, with only 2 or 3 plants seen. They have never been common; their numbers having dwindled from a maximum of around 10. They grow best in clearings and along footpaths. The bumblebee orchid *Ophrys bombyliflora* Link, used to be fairly common, though not widespread on the Upper Rock.

Today, not one has been seen for over 10 years or so. The same fate has befallen the sawfly orchid *Ophrys tenthredinifera* Willd.. This species was always rare, with only 5 or 6 having been seen in the past, mainly along footpaths. Lastly, the pyramidal orchid *Anacamptis pyramidalis* (L.) L.C.M.Richardson, which has not been seen for about 15 years. This species was found on Mediterranean Steps, where up to 5 were once noted. Their decline was probably due to an increase in the growth of surrounding vegetation.

2.2 Birds

All species of bird that have been recorded within or from the Upper Rock (198 species) are listed below:

Cory's shearwater <i>Calonectris diomedea</i>	whimbrel <i>Numenius phaeopus</i>
Balearic shearwater <i>Puffinus mauretanicus</i>	great skua <i>Cartharacta skua</i>
yelkouan shearwater <i>Puffinus yelkouan</i>	Arctic skua <i>Stercorarius parasiticus</i>
great cormorant <i>Phalacrocorax carbo</i>	black-headed gull <i>Larus ridibundus</i>
shag <i>Phalacrocorax aristotelis</i>	Audouin's gull <i>Larus audouinii</i>
northern gannet <i>Morus bassanus</i>	yellow-legged gull <i>Larus michahellis</i>
little bittern <i>Ixobrychus minutus</i>	lesser black-backed gull <i>Larus fuscus</i>
black-crowned night heron <i>Nycticorax nycticorax</i>	common tern <i>Sterna hirundo</i>
cattle egret <i>Bubulcus ibis</i>	Sandwich tern <i>Sterna sandvicensis</i>
little egret <i>Egretta garzetta</i>	black tern <i>Chlidonias niger</i>
grey heron <i>Ardea cinerea</i>	pin-tailed sandgrouse <i>Pterocles alchata</i>
purple heron <i>Ardea purpurea</i>	woodpigeon <i>Columba palumbus</i>
black stork <i>Ciconia nigra</i>	rock dove <i>Columba livia</i>
white stork <i>Ciconia ciconia</i>	stock dove <i>Columba oenas</i>
glossy ibis <i>Plegadis falcinellus</i>	collared dove <i>Streptopelia decaocto</i>
European spoonbill <i>Platalea leucorodia</i>	European turtle dove <i>Streptopelia turtur</i>
greater flamingo <i>Phoenicopterus ruber</i>	great-spotted cuckoo <i>Clamator glandarius</i>
European honey buzzard <i>Pernis apivorus</i>	common cuckoo <i>Cuculus canorus</i>
black kite <i>Milvus migrans</i>	barn owl <i>Tyto alba</i>
red kite <i>Milvus milvus</i>	Eurasian eagle owl <i>Bubo bubo</i>
black-shouldered kite <i>Elanus caeruleus</i>	European scops owl <i>Otus scops</i>
Egyptian vulture <i>Neophron percnopterus</i>	little owl <i>Athene noctua</i>
Lammergeier <i>Gypaetus barbatus</i>	tawny owl <i>Strix aluco</i>
cinereous vulture <i>Aegypius monachus</i>	long-eared owl <i>Asio otus</i>
griffon vulture <i>Gyps fulvus</i>	common nightjar <i>Caprimulgus europaeus</i>
marsh harrier <i>Circus aeruginosus</i>	red-necked nightjar <i>Caprimulgus ruficollis</i>
hen harrier <i>Circus cyaneus</i>	alpine swift <i>Tachymarptis melba</i>
Montagu's harrier <i>Circus pygargus</i>	common swift <i>Apus apus</i>
pallid harrier <i>Circus macrourus</i>	pallid swift <i>Apus pallidus</i>
northern goshawk <i>Accipiter gentilis</i>	river kingfisher <i>Alcedo atthis</i>
Eurasian sparrowhawk <i>Accipiter nisus</i>	European bee-eater <i>Merops apiaster</i>
spotted eagle <i>Aquila clanga</i>	European roller <i>Coracias garrulus</i>
lesser spotted eagle <i>Aquila pomarina</i>	Eurasian hoopoe <i>Upupa epops</i>
Spanish imperial eagle <i>Aquila adalberti</i>	great spotted woodpecker <i>Dendrocopos major</i>
golden eagle <i>Aquila chrysaetos</i>	green woodpecker <i>Picus viridis</i>
booted eagle <i>Hieraaetus pennatus</i>	Eurasian wryneck <i>Jynx torquilla</i>
Bonelli's eagle <i>Hieraaetus fasciatus</i>	short-toed lark <i>Calandrella brachydactyla</i>
common buzzard <i>Buteo buteo</i>	Eurasian skylark <i>Alauda arvensis</i>
long-legged buzzard <i>Buteo rufinus</i>	crested lark <i>Galerida cristata</i>
short-toed eagle <i>Circaetus gallicus</i>	thekla lark <i>Galerida theklae</i>
osprey <i>Pandion haliaetus</i>	woodlark <i>Lullula arborea</i>
merlin <i>Falco columbarius</i>	Eurasian sand martin <i>Riparia riparia</i>
lesser kestrel <i>Falco naumanni</i>	crag martin <i>Ptyonoprogne rupestris</i>
common kestrel <i>Falco tinnunculus</i>	red-rumped swallow <i>Hirundo daurica</i>
European hobby <i>Falco subbuteo</i>	barn swallow <i>Hirundo rustica</i>
red-footed falcon <i>Falco vespertinus</i>	house martin <i>Delichon urbica</i>
peregrine falcon <i>Falco peregrinus</i>	tawny pipit <i>Anthus campestris</i>
lanner falcon <i>Falco biarmicus</i>	tree pipit <i>Anthus trivialis</i>
Eleonora's falcon <i>Falco eleonora</i>	meadow pipit <i>Anthus pratensis</i>
Barbary partridge <i>Alectoris barbara</i>	Richard's pipit <i>Anthus richardi</i>
common quail <i>Coturnix coturnix</i>	yellow wagtail <i>Motacilla flava</i>
common crane <i>Grus grus</i>	grey wagtail <i>Motacilla cinerea</i>
stone curlew <i>Burhinus oedipnemus</i>	white wagtail <i>Motacilla alba</i>
Eurasian avocet <i>Recurvirostra avoceta</i>	winter wren <i>Troglodytes troglodytes</i>
northern lapwing <i>Vanellus vanellus</i>	hedge accentor <i>Prunella modularis</i>
ringed plover <i>Charadrius hiaticula</i>	alpine accentor <i>Prunella collaris</i>
Eurasian woodcock <i>Scolopax rusticola</i>	rufous bush robin <i>Cercotrichas galactotes</i>

Eurasian robin <i>Erithacus rubecula</i>	willow warbler <i>Phylloscopus trochilus</i>
common nightingale <i>Luscinia megarynchos</i>	Pallas's warbler <i>Phylloscopus proregulus</i>
bluethroat <i>Luscinia svecica</i>	yellow-browed warbler <i>Phylloscopus inornatus</i>
black redstart <i>Phoenicurus ochruros</i>	firecrest <i>Regulus ignicapillus</i>
common redstart <i>Phoenicurus phoenicurus</i>	goldcrest <i>Regulus regulus</i>
stonechat <i>Saxicola torquata</i>	spotted flycatcher <i>Muscicapa striata</i>
whinchat <i>Saxicola rubetra</i>	pie'd flycatcher <i>Ficedula hypoleuca</i>
northern wheatear <i>Oenanthe oenanthe</i>	long-tailed tit <i>Aegithalos caudatus</i>
black-eared wheatear <i>Oenanthe hispanica</i>	crested tit <i>Parus cristatus</i>
red-tailed rock thrush <i>Monticola saxatilis</i>	coal tit <i>Parus ater</i>
blue rock thrush <i>Monticola solitarius</i>	blue tit <i>Parus caeruleus</i>
ring ouzel <i>Turdus torquatus</i>	great tit <i>Parus major</i>
blackbird <i>Turdus merula</i>	wallcreeper <i>Tichodroma muraria</i>
song thrush <i>Turdus philomelos</i>	short-toed treecreeper <i>Certhia brachydactyla</i>
redwing <i>Turdus iliacus</i>	Eurasian golden oriole <i>Oriolus oriolus</i>
mistle thrush <i>Turdus viscivorus</i>	woodchat shrike <i>Lanius senator</i>
zitting cisticola <i>Cisticola juncidis</i>	Southern grey shrike <i>Lanius meridionalis</i>
common grasshopper warbler <i>Locustella naevia</i>	common magpie <i>Pica pica</i>
Savi's warbler <i>Locustella luscinioides</i>	red-billed chough <i>Pyrrhocorax pyrrhocorax</i>
sedge warbler <i>Acrocephalus schoenobaenus</i>	yellow-billed chough <i>Pyrrhocorax graculus</i>
common reed warbler <i>Acrocephalus scirpaceus</i>	western jackdaw <i>Corvus monedula</i>
great reed warbler <i>Acrocephalus arundinaceus</i>	northern raven <i>Corvus corax</i>
Blyth's reed warbler <i>Acrocephalus dumetorum</i>	spotless starling <i>Sturnus unicolor</i>
Cetti's warbler <i>Cettia cetti</i>	common starling <i>Sturnus vulgaris</i>
western olivaceous warbler <i>Hippolais pallida</i>	house sparrow <i>Passer domesticus</i>
melodious warbler <i>Hippolais polyglotta</i>	Spanish sparrow <i>Passer hispaniolensis</i>
Icterine warbler <i>Hippolais icterina</i>	common linnet <i>Carduelis cannabina</i>
garden warbler <i>Sylvia borin</i>	common chaffinch <i>Fringilla coelebs</i>
Dartford warbler <i>Sylvia undata</i>	brambling <i>Fringilla montifringilla</i>
Marmora's warbler <i>Sylvia sarda</i>	Eurasian serin <i>Serinus serinus</i>
subalpine warbler <i>Sylvia cantillans</i>	greenfinch <i>Carduelis chloris</i>
spectacled warbler <i>Sylvia conspicillata</i>	goldfinch <i>Carduelis carduelis</i>
common whitethroat <i>Sylvia communis</i>	siskin <i>Carduelis spinus</i>
lesser whitethroat <i>Sylvia curruca</i>	hawfinch <i>Coccothraustes coccothraustes</i>
Sardinian warbler <i>Sylvia melanocephala</i>	common crossbill <i>Loxia curvirostra</i>
orpean warbler <i>Sylvia hortensis</i>	bullfinch <i>Pyrrhula pyrrhula</i>
blackcap <i>Sylvia atricapilla</i>	scarlet rosefinch <i>Carpodacus erythrinus</i>
common chiffchaff <i>Phylloscopus collybita</i>	indigo bunting <i>Passerina cyanea</i>
Iberian chiffchaff <i>Phylloscopus ibericus</i>	ortolan bunting <i>Emberiza hortulana</i>
mountain chiffchaff <i>Phylloscopus sindianus</i>	cirl bunting <i>Emberiza cirlus</i>
western Bonelli's warbler <i>Phylloscopus bonelli</i>	rock bunting <i>Emberiza cia</i>
wood warbler <i>Phylloscopus sibilatrix</i>	corn bunting <i>Miliaria calandra</i>

2.3 Mammals

The (non-human) mammals that are currently found within the Nature Reserve are listed below

greater white-toothed shrew <i>Crocidura russula</i>	Barbary macaque <i>Macaca sylvanus</i>
greater mouse-eared bat <i>Myotis myotis</i>	house mouse <i>Mus domesticus</i>
Mediterranean pipistrelle <i>Pipistrellus mediterraneus</i>	black rat <i>Rattus rattus</i>
Schreiber's bat <i>Miniopterus schreibersii</i>	common rabbit <i>Oryctolagus cuniculus</i>
European free-tailed bat <i>Tadarida teniotis</i>	

2.4 Reptiles and Amphibians

The reptiles and amphibians that occur within the Upper Rock Nature Reserve are listed below:

common toad <i>Bufo bufo</i>	large psammodromus <i>Psammodromus algirus</i>
Perez' marsh frog <i>Rana perezi</i>	horseshoe whip-snake <i>Coluber hippocrepis</i>
amphisbaenian <i>Blanus cinereus</i>	Montpellier snake <i>Malopogon monspessulanus</i>
Turkish gecko <i>Hemidactylus turcicus</i>	ladder snake <i>Elaphe scalaris</i>
Moorish gecko <i>Tarentola mauritanica</i>	southern smooth snake <i>Coronella girondica</i>
ocellated lizard <i>Lacerta lepida</i>	false smooth snake <i>Macroprotodon cucullatus</i>
Iberian wall lizard <i>Podarcis hispanica</i>	grass snake <i>Natrix natrix</i>

The two amphibians (*Bufo bufo* and *Rana perezi*) have been introduced to areas where ponds have been constructed by man. All the reptiles are native to Gibraltar.

2.5 Beetles (Coleoptera)

The authors of this report are currently conducting a study of the beetle fauna of Gibraltar. Although a detailed picture of the beetles of the Upper Rock Nature Reserve cannot be provided, some interesting data have already arisen. Many different areas of Gibraltar have their own distinctive insect faunas due to the sharp differences in habitat that exist. Thus, species that are common in some areas may be rare or absent from others. For example, the tenebrionid *Akis acuminata*, probably the most well known beetle in Gibraltar (the typical 'escarabajo' people can remember), is very common and conspicuous in sandier areas such as those found on the eastern side, the isthmus and the gardens of the south district and yet this species seems to be absent from the Nature Reserve, whose rocky terrain does not suit this beetle.

In addition, some interesting species have been identified. The carabid *Laemostenus (Ceuthorstenes) mauretanicus* subsp. *polymephus* is a cave-dwelling taxon that has only been recorded from Gibraltar, San Roque and two caves in Cadiz and Málaga (Serrano 2003). Given this species' habits, it may well be that Gibraltar, with its numerous caves, is one of this beetle's strongholds. Similarly, the tenebrionid *Alphasida (Betasida) argentolimbata*, which has been recorded from the Upper Rock, is only found in nearby San Roque and Algeciras (J. de Ferrer, *pers. comm.*). The cerambycid beetle *Lucasianus levaillantii*, a mainly North African species, has also been recorded from the Upper Rock, where it probably feeds on the small population of *Cupressus sempervirens* that is found in the gardens of the Bruce's Farm residential area (Perez & Bensusan, *in prep.*). This beetle was first recorded in Iberia in 1987, where it is thought that it was introduced from North Africa (Vives 2000).

Another interesting find has been that of *Buprestis (Yamina) sanguinea*, a beetle belonging to the family Buprestidae that is a popular species amongst Spanish Coleopterists. This species was previously known only from a few locations in Madrid, Cataluña and Aragón, as well as a few records from North Africa that may correspond to a closely related species and not *B. (Yamina) sanguinea* itself (Cobos 1986). *B. (Yamina) sanguinea* feeds on plants that belong to the genus *Ephedra*. *Ephedra fragilis* is relatively common in Gibraltar, and it is on this plant that this beetle can be located. Although *B. (Yamina) sanguinea* has so far only been found on the southernmost slopes of the upper Rock Nature Reserve, it is likely that it has a more widespread distribution within Gibraltar. Since *Ephedra fragilis* is a very rare plant in the hinterland, the population of *B. (Yamina) sanguinea* that exists in Gibraltar is a very isolated one, and is thus of great value and importance.

2.6 Butterflies & Moths (Lepidoptera)

A list of butterflies:

swallowtail <i>Papilio machaon</i>	Lang's short-tailed blue <i>Leptotes pirithous</i>
scarce swallowtail <i>Iphiclides podalirius feisthameli</i>	geranium bronze <i>Carcyreus marshalii</i>
Spanish festoon <i>Zerynthia rumina</i>	holly blue <i>Celastrina argiolus</i>
large white <i>Pieris brassicae</i>	southern brown argus <i>Aricia cramera</i>
small white <i>Artogeia rapae</i>	common blue <i>Polyommatus icarus</i>
Bath white <i>Pontia daplidice</i>	two-tailed pasha <i>Charaxes jasius</i>
dappled white <i>Euchloe crameri</i>	red admiral <i>Vanessa atalanta</i>
Portuguese dappled white <i>Euchloe tagis</i>	painted lady <i>Cynthia cardui</i>
green-striped white <i>Euchloe belemia</i>	striped grayling <i>Pseudotergumia fida</i>
desert orange tip <i>Colotis evagore nouna</i>	meadow brown <i>Maniola jurtina</i>
Morocco orange tip <i>Anthocharis belia euphenoides</i>	southern gatekeeper <i>Pyronia cecilia</i>
clouded yellow <i>Colias crocea</i>	Spanish gatekeeper <i>Pyronia bathsheba</i>
brimstone <i>Gonopteryx rhamni</i>	speckled wood <i>Pararge aegeria</i>
Cleopatra <i>Gonopteryx cleopatra</i>	wall brown <i>Lasiommata megera</i>
wood white <i>Leptidea sinapis</i>	monarch <i>Danaus plexippus</i>
Ilex hairstreak <i>Satyrium ilicis</i>	sage skipper <i>Muschampia proto</i>
blue-spot hairstreak <i>Strymonidia spini</i>	mallow skipper <i>Carcharodus alceae</i>
small copper <i>Lycaena phlaeas</i>	red-underwing skipper <i>Spialia sertorius</i>
long-tailed blue <i>Lampides boeticus</i>	Lulworth skipper <i>Thymelicus action</i>

A provisional list of moths:

<i>Nemophora raddella latrellella</i>	<i>Pleurota ericella</i>	<i>Mirificarma eburnella</i>
<i>Melasina ciliaris</i>	<i>Agonopterix heracliiana</i>	<i>Eurodachtha pallicornella</i>
<i>Deuterohyalina albida</i>	<i>Agonopterix scopariella</i>	<i>Pterolonche (Gomezbustillus) pulverulenta</i>
<i>Reisserita chrysopterella</i>	<i>Depressaria pastinacella</i>	<i>Enolmis acanthella</i>
<i>Tinea pellionella</i>	<i>Coleophora dianthi</i>	<i>Phtheochroa rugosana</i>
<i>Dialectica scalariella</i>	<i>Ethmia bipunctella</i>	<i>Aethes rutilana</i>
<i>Batia lunaris</i>	<i>Pyroderces argyrogrammos</i>	<i>Aethes smeathmanniana</i>
<i>Esperia sulphurella</i>	<i>Epidola stigma</i>	<i>Cnephasia alticolana</i>

<i>Avaria hyerana</i>	<i>Agdistis pseudocanariensis</i>	<i>Thaumetopoea pityocampa</i>
<i>Cacoecimorpha pronubana</i>	<i>Lantanophaga pusillidactylus</i>	<i>Orgyia trigotephras</i>
<i>Clepsis consimilana</i>	<i>Zeuzera pyrina</i>	<i>Lymantria dispar</i>
<i>Epinotia thapsiana</i>	<i>Drepana binaria</i>	<i>Lymantria atlantica</i>
<i>Crociosema plebejana</i>	<i>Cilix glaucata</i>	<i>Eilema lurideola</i>
<i>Cydia pomonella</i>	<i>Abraxas pantaria</i>	<i>Eilema complana</i>
<i>Brachodes cassandrella</i>	<i>Stegania trimaculata</i>	<i>Eilema caniola</i>
<i>Paranthrene tabaniformis synagriformis</i>	<i>Rhoptria asperaria</i>	<i>Coscinia cribaria</i>
<i>Choreutis pariana</i>	<i>Athrolopha pennigeraria</i>	<i>Phragmatobia fuliginosa</i>
<i>Zygaena fausta gibraltaria</i>	<i>Menophra abruptaria</i>	<i>Cymbalophora pudica</i>
<i>Zygaena hilaris</i>	<i>Menophra japygiaria</i>	<i>Epicalia villica villica</i>
<i>Alucita hexadactyla</i>	<i>Peridobates rhomboidarius</i>	<i>Utetheisa pulchella</i>
<i>Alucita desmodactyla</i>	<i>Biston stratarius</i>	<i>Nodaria nodosalis</i>
<i>Galleria mellonella</i>	<i>Campaea honoraria</i>	<i>Pechipogo plumigeralis</i>
<i>Corcyra cephalonica</i>	<i>Crocallis dardoinaria</i>	<i>Polygogon crinalis</i>
<i>Lamoria jordanis</i>	<i>Petrophora narbonea</i>	<i>Hypena obsitalis</i>
<i>Pyralis obsoletalis</i>	<i>Gnophos (Dicrognophos) perspersatus</i>	<i>Hypena lividalis</i>
<i>Pyralis farinalis</i>	<i>Gnophos (Euchrognophos) mucidarius mucidarius</i>	<i>Catocala (Catocala) conjuncta</i>
<i>Orthopygia glaucinalis</i>	<i>Aspitates ochrearius</i>	<i>Catocala (Catocala) elocata</i>
<i>Aglossa pinguinalis</i>	<i>Onychroa agaritharia</i>	<i>Catocala (Catocala) nymphagoga</i>
<i>Aglossa caprealis</i>	<i>Pseudoterpna coronillaria</i>	<i>Catocala (Catocala) conversa</i>
<i>Hypsopygia costalis</i>	<i>Chlorissa etruscaria</i>	<i>Catocala (Catocala) nymphaea</i>
<i>Ulotricha egregialis</i>	<i>Microloxia herbaria</i>	<i>Ophiusa tirhaca</i>
<i>Actenia brunnealis</i>	<i>Bustilloxia menadiaria</i>	<i>Dysgonia algira</i>
<i>Endotrichia flammealis</i>	<i>Hemistola biliosata</i>	<i>Tyta luctuosa</i>
<i>Bradyrrhoa cantenerella</i>	<i>Xenochlorodes olympiaria</i>	<i>Tathorynchus exsiccata</i>
<i>Etiella zinckenella</i>	<i>Xenochlorodes beryllaria</i>	<i>Catephia alchymista</i>
<i>Pempeliella ardosiella</i>	<i>Idaea mediaria</i>	<i>Pandesma robusta</i>
<i>Oxybia transversella</i>	<i>Idaea attenuaria</i>	<i>Eutelia adulatrix</i>
<i>Apomyelois ceratoniae</i>	<i>Idaea alyssumata</i>	<i>Nola cicatricalis</i>
<i>Zophodia grossulariella</i>	<i>Idaea belemiata</i>	<i>Nola cristatula</i>
<i>Homoeosoma sinuellum</i>	<i>Idaea elongaria</i>	<i>Earias clorana</i>
<i>Plodia interpunctella</i>	<i>Idaea inquinata</i>	<i>Earias insulana</i>
<i>Ephestia kuehniella</i>	<i>Idaea seriata</i>	<i>Raphia hybris</i>
<i>Ematheudes punctella</i>	<i>Idaea camparia</i>	<i>Acronicta psi</i>
<i>Agriphila geniculea</i>	<i>Idaea cervantaria</i>	<i>Acronicta rumicis</i>
<i>andalusiella</i>	<i>Idaea eugeniata</i>	<i>Cryphia algae</i>
<i>Ancylolomia tentaculella</i>	<i>Idaea degeneraria</i>	<i>Cryphia ravula</i>
<i>Hellula undalis</i>	<i>Cyclophora pupillaria</i>	<i>Cryphia raptricula</i>
<i>Eudonia lineola</i>	<i>Cyclophora porata</i>	<i>Cryphia muralis</i>
<i>Nymphula stagnata</i>	<i>Timandra griseata</i>	<i>Zeebeda falsalis</i>
<i>Evergestis limbata</i>	<i>Scopula marginepunctata</i>	<i>Acontia lucida</i>
<i>Evergestis isatidalis</i>	<i>Scopula imitaria</i>	<i>Eublemma ostrina</i>
<i>Pyrausta purpuralis</i>	<i>Rhodometra sacaria</i>	<i>Eublemma parva</i>
<i>Pyrausta sanguinalis</i>	<i>Casilda consecraria</i>	<i>Eublemma pura</i>
<i>Uresiphita limbalis</i>	<i>Orthonama obstipata</i>	<i>Metachrostis velox</i>
<i>Udea numeralis</i>	<i>Xanthorhoe montanata</i>	<i>Trichoplusia ni</i>
<i>Udea ferrugalis</i>	<i>Xanthorhoe fluctuata</i>	<i>Trichoplusia orichalcea</i>
<i>Mecyna asinalis</i>	<i>Nebula ibericata</i>	<i>Ctenoplusia limberena</i>
<i>Nomophila noctuella</i>	<i>Horisme scorteata</i>	<i>Chrysodeixis chalcites</i>
<i>Dolicharthria punctalis</i>	<i>Eupithecia unedonata</i>	<i>Abrostola triplasia</i>
<i>Dolicharthria bruguieralis</i>	<i>Eupithecia centaureata</i>	<i>Autographa gamma</i>
<i>Duponchelia fovealis</i>	<i>Eupithecia gratiosata</i>	<i>Cucullia chamomillae</i>
<i>Antigastra catalaunalis</i>	<i>Eupithecia dodoneata</i>	<i>Calophasia platyptera</i>
<i>Diasemiopsis ramburalis</i>	<i>Eupithecia scopariata</i>	<i>Heliothis peltigera</i>
<i>Metasia suppandalis</i>	<i>Gymnoscelis ruffifasciata</i>	<i>Helicoverpa armigera</i>
<i>Hydriris ornatalis</i>	<i>Chesias rufata</i>	<i>Periphanes incarnata</i>
<i>Palpita unionalis</i>	<i>Lasiocampa trifolii</i>	<i>Aegle vespertinalis</i>
<i>Merrifieldia tridactyla</i>	<i>Malacosoma neustria</i>	<i>Synthymia fixa</i>
<i>Emmelina monodactyla</i>	<i>Streblote panda</i>	<i>Caradrina clavipalpis</i>
<i>Oidaematophorus lithodactylus</i>	<i>Acherontia atropos</i>	<i>Eremodrina oberthuri</i>
<i>Crombrugghia distans</i>	<i>Polyptychus trisecta</i>	<i>Hoplodrina ambigua</i>
<i>Crombrugghia tristis</i>	<i>Agrius convolvuli</i>	<i>Spodoptera exigua</i>
<i>Amblyptilia acanthodactyla</i>	<i>Macroglossum stellatarum</i>	<i>Spodoptera littoralis</i>
<i>Stenoptilia stigmatodactyla</i>	<i>Hyles livornica</i>	<i>Sesamia nonagrioides</i>
<i>Stenoptilia zophodactyla</i>	<i>Hyles celerio</i>	<i>Anthracia ephialtes</i>
<i>Agdistis frankeniae</i>	<i>Hyles euphorbiae</i>	<i>Phlogophora meticulosa</i>

<i>Callopietria latreillei</i>	<i>Mythimna albipuncta</i>	<i>Noctua fimbriata</i>
<i>Aporophyla nigra</i>	<i>Mythimna vitellina</i>	<i>Noctua comes</i>
<i>Xylena vetusta</i>	<i>Mythimna l-album</i>	<i>Noctua janthe</i>
<i>Xylocampa areola</i>	<i>Mythimna prominens</i>	<i>Xestia c-nigrum</i>
<i>Dichonioxa tenebrosa</i>	<i>Mythimna (Morphopoliana) languida</i>	<i>Cerastis faceta</i>
<i>Polymixis dubia</i>	<i>Mythimna loreyi</i>	<i>Peridroma saucia</i>
<i>Blepharita spinosa</i>	<i>Mythimna unipuncta</i>	<i>Agrotis obesa</i>
<i>Dicestra trifolii</i>	<i>Panolis flammea</i>	<i>Agrotis crassa</i>
<i>Diataraxia oleracea</i>	<i>Ochopleura plecta</i>	<i>Agrotis ipsilon</i>
<i>Hecatera dysodea</i>	<i>Ochopleura leucogaster</i>	<i>Agrotis segetum</i>
<i>Hecatera bicolorata</i>	<i>Diarsia dahlia</i>	<i>Agrotis puta</i>
<i>Hadena perplexa</i>	<i>Noctua pronuba</i>	<i>Agrotis biconica</i>
<i>Mythimna putrescens</i>		

2.7 Dragonflies & Damselflies (Odonata)

<i>Aeshna mixta</i>	<i>Anax parthenope</i>
<i>Hemianax ephippiger</i>	<i>Sympetrum fonscolombeii</i>
<i>Anax imperator</i>	<i>Sympetrum striolatum</i>

Other orders of insects have not been so well documented, and even those that are listed are by no means complete. However, amongst other insect and invertebrate taxa, there are some well-known species that can also be found within the Nature Reserve. These include the scorpion *Buthus occitanus*, the Gibraltar funnel-web spider *Macrothele calpeiana*, the centipede *Scolopendra cingulatus*, the violet carpenter bee *Xylocopa violacea* and the praying mantis *Mantis religiosa*. An intensive study of the entire biodiversity of the Upper Rock Nature Reserve, to include all invertebrates, would be highly desirable.

2.8 Isopods (by Jason Easter)

A provisional list of the Isopods of the Upper Rock is given next. Those recorded on the Lower Slopes have been included in this list.

<i>Iberoniscus beruili</i>	<i>Porcellio flavocinctus</i>
<i>Armadillo officinalis</i>	<i>Porcellio scaber</i>
<i>Armadillidium granulatum</i>	<i>Porcellionides pruinosus</i>
<i>Armadillidium vulgare</i>	

2.9 Molluscs (by Alex Menez)

The area defined as the upper rock is based on Menez (1993). Nomenclature and order of the systematic list follows Ortiz de Zárate (1962); Kerney & Cameron (1979); Kerney *et al.* (1983); Vaught (1989); Giusti *et al.* (1995); Kerney (1999) and Falkner *et al.* (2002).

<i>Acicula norrisi</i>	<i>Oxychilus hydatinus</i>
<i>Lauria cylindracea</i>	<i>Milax gagates</i>
<i>Pyramidula rupestris</i>	<i>Limacus flavus</i>
<i>Chondrina calpica</i>	<i>Deroceras ponsonbyi</i>
<i>Granopupa granum</i>	<i>Geomalacus malagensis</i>
<i>Truncatellina cylindrica</i>	<i>Caracollina lenticula</i>
<i>Cecilioides acicula</i>	<i>Oestophora calpeana</i>
<i>Cecilioides jani</i>	<i>Trochoidea spp.</i>
<i>Cecilioides petitiana</i>	<i>Candidula intersecta</i>
<i>Cecilioides connollyi</i>	<i>Pseudotachea litturata</i>
<i>Ferussacia folliculus</i>	<i>Otala lactea</i>
<i>Rumina decollata</i>	<i>Cornu aspersum</i>
<i>Vitrea contracta</i>	<i>Iberus marmoratus</i>
<i>Oxychilus draparnaudi</i>	



Cream spot tiger

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Appendix 2: Vandalism, Litter and Defacement

Photographs highlighting the extent of vandalisms, defacement and litter within the Upper Rock Nature Reserve are shown below.

Litter



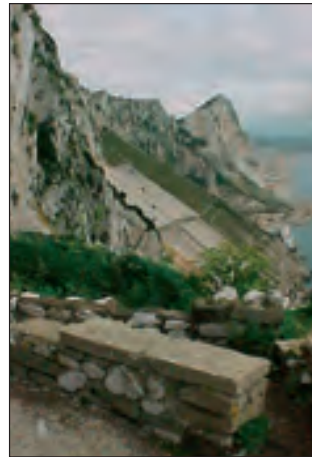
Graffiti



Gibraltar Neanderthals



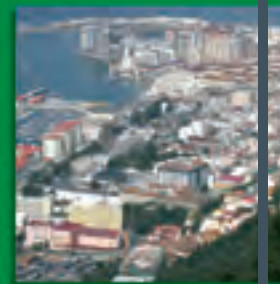
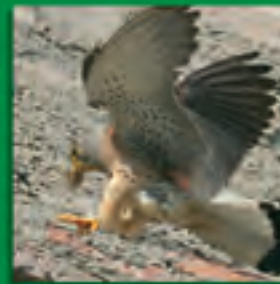
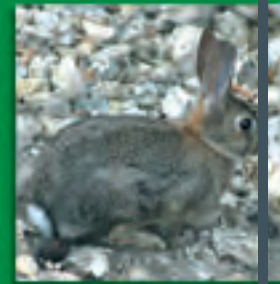
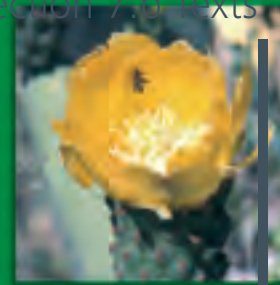
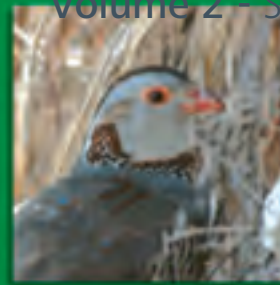
Structures, Roads and Damage





**Gibraltar Ornithological
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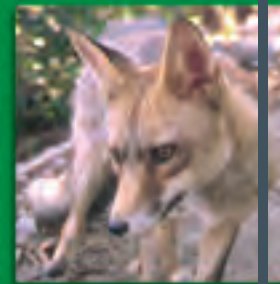
Biodiversity Action Plan Gibraltar: Planning for Nature-2006



Biodiversity Action Plan, Gibraltar: Planning for Nature

Charles E. Perez

The Gibraltar Ornithological and Natural History Society





*Biodiversity
Action Plan,
Gibraltar:
Planning
for Nature*

Charles E. Perez

**The Gibraltar Ornithological
and Natural History Society**

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Jews' Gate, Upper Rock Nature Reserve, P.O.Box 843, Gibraltar.

Citation: Perez, C.E. (2006). Biodiversity Action Plan, Gibraltar: Planning for Nature.
The Gibraltar Ornithological & Natural History Society. Gibraltar.

Published by the Gibraltar Ornithological & Natural History Society.
Research and publication funded by the Overseas Territories Environment Programme (OTEP)
of the Foreign & Commonwealth Office of Her Majesty's Government.

Printed and bound by Roca Graphics Ltd.

Tuckey's Lane, Gibraltar. Tel. +(350) 59755 - From Spain: (9567) 59755

Contents

Foreword	4	5) Species Action Plans	109
Acknowledgements	5	Birds	110
1) Introduction	9	Mediterranean Shag	110
What is Biodiversity	9	Lesser Kestrel	112
The Biodiversity Convention	11	Peregrine Falcon	113
Gibraltar	12	Barbary Partridge	115
The Significance of Biodiversity	13	Eurasian Eagle Owl	116
Threats to Biodiversity	14	Mammals	118
The Gibraltar Action Plan	16	All Cetaceans	118
2) The International Context	19	Barbary Macaque	120
EU Birds Directive	20	Red Fox	122
The Bonn Convention	24	European Rabbit	123
EUROBATS	27	Soprano Pipistrelle	124
ACCOBAMS	27	Schreiber's Bat	125
Bern Convention	28	Flowering Plants	126
CITES	30	All Orchids	126
World Heritage Convention	30	Gibraltar Chickweed	128
EC Habitats Directive	30	Gibraltar Champion	129
The Natura 2000 Network	31	Gibraltar Thyme	130
Convention on Biological Diversity	32	Gibraltar Restharrow	131
Cartagena Protocol on Biosafety	33	Gibraltar Sea Lavender	132
Alien Species	33	Gibraltar Candytuft	134
Biodiversity and Tourism	34	Gibraltar Saxifrage	135
Climate Change and Biodiversity	34	Sweet Bay or Laurel	136
Ecosystem Approach	34	Narrow-leaved Ash	137
Global Strategy for Plant Conservation	35	<i>Buprestis (Yamina) sanguinea ssp. calpetana</i>	138
Global Taxonomy Initiative	35	Gibraltar Funnel-web Spider	139
Impact Assessment, Liability and Redress	35	<i>Acicula norrisi</i>	140
Indicators	36	<i>Oestophora calpeana</i>	141
Protected Areas	36	Mediterranean Ribbed Limpet	142
Public Awareness and Education	36	6) Alien, Invasive & Pest Species	145
Sustainable use of Biodiversity	37	Alien Invasive Flora	148
2010 Biodiversity Target	37	Rooikrans	149
3) Key Species & Habitats	41	Orange or Golden Wreath Wattle	151
4) Habitats	51	Pinwheel & Tree Houseleek	152
Terrestrial Habitats	52	Century Plants	153
1 Upper Rock Nature Reserve	52	Tree of Heaven	155
2 Cliffs	55	Tree Aloe & Soapy Aloe	156
3 Lower Slopes and Buffer Zone	59	Hottentot Fig	158
4 Talus	62	African Cornflag	161
5 Great Sand Slopes	66	Purple Dewplant	162
6 The Isthmus	72	Bush Lantana or Shrub Verbena	163
7 South District	74	Shrub Tobacco	164
8 Urban Green Areas	81	Prickly Pear	165
9 Urban Areas	84	Bermuda Buttercup	168
10 Caves	89	Cape Wattle	169
Marine Habitats	93	Kikuyu Grass	171
11 Intertidal Zone	96	Cape Ivy	172
12 Artificial Reefs	99	Nasturtium	174
13 Reefs & Inshore rocky outcrops	101	Spineless Yucca	175
13 Sand	103	Pest Species	176
14 Marl	105	Bear's Breech	176
15 Rock	106	Black Rat	177
		Feral Cat	179
		Goat	180
		Feral Pigeon	182
		Yellow-legged Gull	184
		7) References & Glossary	
		References	189
		Glossary	192

Foreword

The variety of plants and animals with which we share Gibraltar is truly remarkable. More and more people are aware of this, but somehow I get the feeling that fewer and fewer get to experience it for themselves.

This is a problem. Lack of familiarity with the actual plants and animals that live around us means that decision makers – from the developer and planner who formulates a project, or the politician who approves it, to the builders who cut down the bush or disturb the nest – need to be constantly reminded of the consequence of their actions, when really they should be so aware of these that their decisions will be strongly influenced accordingly.

Having experts at hand is not good enough. They may forget to consult them, or decide, whether they admit or not, to act regardless of advice. The only real way to ensure that the diversity of living things persists and flourishes is for those on the front line to wish this to be so. And for that they need the knowledge.

Armed with that, it's not so difficult. Often slight changes in plan will have the desired effect. At other times ideas that seemed good may have to be significantly changed, or even abandoned.

The possible loss of biological diversity is one of the greatest environmental problems facing Gibraltar, together, of course, with the problem of increasing demands on energy.

The Gibraltar Ornithological & Natural History Society (GONHS) has since its beginnings thirty years ago, been at the helm of enjoying our biodiversity (well before we called it that) and protecting and enhancing it.

It was therefore logical that now, at this point in Gibraltar's journey through its history, it should synthesise the wealth of knowledge it has accrued and provide a Plan that will serve to achieve these aims. We produce this on the year of our 30th Anniversary, in Gibraltar Biodiversity Year, a year too with other, political landmarks. Political and constitutional progress, which is occurring in Gibraltar as I write, has to go hand in hand with assuming responsibility for international obligations, which includes obligations to the environment in general and biodiversity in particular.

Biodiversity Conservation is also increasingly a theme and an aim for organisations around the world, not least the UK's Overseas Territories and other small areas or regions.

Charlie Perez's work sets out the basis for biodiversity conservation in Gibraltar, giving its background, its international context, and then, while including a wealth of information, succinctly states what has to be done.

While GONHS will continue to work to ensure that these principles find their way into action, much of our collective work has been done. We present the Biodiversity Action Plan, providing the basis and throwing down the challenge to those who now need to put it into effect.

John Cortes

General Secretary

The Gibraltar Ornithological & Natural History Society

2006

Acknowledgements

The author would like to thank the GONHS Biodiversity Team members Mr Leslie Linares, Mr Keith Bensusan and Dr. John Cortes for their assistance in the many surveys of the different habitats that were undertaken during the initial research period. To Dr Eric Shaw and Mr Steven Warr for their useful comments on the Marine Habitats, to Mr Alex Menez for providing data and useful comments on the action plans on the terrestrial molluscs, to Dr Darren Fa and Dr Terence Ocaña for providing data and useful comments on the Mediterranean Ribbed Limpet.

The author is in debt to Mr Keith Bensusan for his invaluable contribution in the analysis of the status of species in chapter 3 'Key Species and Habitats' and to Mr Leslie Linares for his important contribution to the knowledge of the flora of Gibraltar.

The author would also like to thank the Chief Fire Officer, Mr Louis Casciaro for providing information on fire incidents, to the Committee of the Gibraltar Branch of the European Federation of Sea Anglers (EFSA) for their useful comments on the marine environment and fish species, and to the photographers Mr Leslie Linares, Mr Eric Shaw, Mrs Yvonne Benting, Dr John Cortes, Mr Albert Yome, Mr Julien Martinez, Miss Torborg Berge, Mr Bob Wheeler and the Gibraltar Tourist Board for the use of their photographs and to Miss Salli Menez for her fine drawings of the terrestrial molluscs. Distribution maps were produced using DMAP for windows version 7.1f by Alan Morton.

Special thanks go to Wildlife (Gibraltar) for providing the office and equipment within the Gibraltar Botanic Gardens at the Alameda to enable the production of the report.

The work involved in the production of this report was funded by the Overseas Territories Environment Programme (OTEP) of the Foreign & Commonwealth Office. Thanks go to Denise Dudgeon and Rebecca Claxton for their help and support in the administration of the Programme.

Thanks are also due to Dr Mike Pienkowski and to Frances Marks of the United Kingdom Overseas Territories Conservation Forum for their encouragement and support.

Finally the author would like to express his gratitude to Mr Keith Bensusan, Dr. John Cortes, Dr. Ernest Garcia and Mr Leslie Linares for their invaluable help in checking the manuscript.





1. *Introduction*

Gibraltar Neanderthals

1. Introduction

The 'Convention on Biological Diversity' was signed in 1993 and ratified by forty-three countries, including the United Kingdom. Gibraltar, as part of this member state, was obliged to adopt this, but initially did not take an active part in the implementation of the objectives of the Convention. In 2003, the Gibraltar Ornithological & Natural History Society, realising the need to address some of these objectives, and with an active base of naturalists and scientists and knowledge of the requirements, launched an initiative to catalogue Gibraltar's wildlife at a taxonomic level. The Gibraltar Biodiversity Project was launched by GONHS on 28th January 2004, and formed the initial step in bridging the gaps in our knowledge of the Biodiversity of our territory. As part of this initiative, a proposal for funding was submitted to the UK Overseas Territories Environment Programme of the Foreign and Commonwealth Office for the preparation of a Biodiversity Action Plan for Gibraltar. This would encompass, not only the ongoing taxonomic assessments of the Biodiversity of the territory, but also the need to identify areas at risk, encourage alternative sustainable use and development, and more importantly create public awareness and participation, at all levels, on the significance of Biodiversity as a strategic tool in the field of conservation. The bid was successful, and the author of this report was engaged in August 2004 to prepare such a Plan.

This document is based on the UK's Biodiversity Action Plan that was produced in 1995 under the headings 'Biodiversity: The UK Steering Group Report. Volume I: Meeting the Rio Challenge' and 'Volume II: Action Plans' (HMSO 1995).

The Plan provides the background to the meaning and importance of Biodiversity at a global scale and, using the UK Biodiversity Action Plan as a basis, translates this to the territory of Gibraltar and puts into perspective the objectives and the requirements for making this Biodiversity Action Plan an operational success. The report analyses historical accounts of Gibraltar's environment and diversity of wildlife, and describes the 'progress' and expansion of the human population and urbanisation through the centuries.

The 'Habitats' chapter covers our two main ecosystems - the terrestrial and the marine - both of which are divided into distinct sites and habitat types, each with its unique species associations. Each has its own action plan that describes the current status of the habitat and factors affecting its welfare, including existing and potential threats, and the action required to remedy them. Another section stresses the need for public awareness and involvement in Biodiversity Conservation at all levels, from an educational standpoint to all other sectors of the community.

The 'Gibraltar Biodiversity Project' aims to catalogue as much of the flora and fauna of Gibraltar as possible, in order to be able to assess the conservation requirements of species and habitats accurately. This document emphasises the need for constant monitoring and research and invites public participation in the 'Gibraltar Biodiversity Project'. It contains species lists for some of our flora and fauna and categorises those species according to their conservation status and requirements. The document lists the serious threats to our Biodiversity and addresses these in the Action Plan, where each particular problem is addressed and remedial proposals, recommendations and targets are presented.

What is Biodiversity?

In the last quarter of the 20th century, scientists were extremely worried at the rate of deforestation that was taking place on a global scale, particularly in tropical regions. The tropical rainforests were known to hold the highest number of species per unit area in the world but, with the continual loss of habitat, a great many were being lost even before they could be described. There was a need to quantify the total number of species of plants and animals in every region of the world, at local, regional and global levels. An assessment of Global Biodiversity also had to take into account natural communities and habitats, since these are crucial to the preservation of Biodiversity and serve as indicators of ecological change. The basic requirement to identify and catalogue species within particular habitats and ecosystems, to assess species richness and diversity and identify this diversity within natural communities, gave form to the term 'Biological Diversity', or as we now know it 'Biodiversity'.

The Oxford Dictionary of Ecology (Allaby, 1998) gives the meaning of Biodiversity as '*A portmanteau term, which gained popularity in the late 1980s, used to describe all aspects of biological diversity, especially including species richness, ecosystem complexity, and genetic variation*'. The meaning of Biodiversity, given in A Dictionary of Entomology (2001) is '*The condition of being different biologically*'. It also quotes several definitions for this term from different scientists and organisations, which are repro-

duced here to enable a clearer understanding of the term.

1. *'...the variety of the world's organisms, including their genetic diversity and the assemblages they form. A blanket term for the natural biological wealth that undergirds human life and well-being. The breadth of the concept reflects the interrelatedness of genes, species and ecosystems.'* (Reid & Miller 1989).

2. *'The variety of living organisms considered at all levels, from genetics through species, to higher taxonomic levels, and including the variety of habitats and ecosystems'* (Meffe & Carroll).

3. *'...the variety and variability of living organisms and the ecological complexes in which they occur.'* OTA.

Yet another definition that serves to clarify the complexities of biodiversity can be found in Reaka-Kudla *et al.* (1997):

'Biodiversity is defined as all heredity-based variation at all levels of organisation, from the genes within a single population or species, to the species composing all or part of a local community, and finally to the communities themselves that compose the living parts of the multifarious ecosystems of the world.'

We can see from the various meanings and interpretations that the key elements of Biodiversity are species richness, ecosystems and genetic variability. These three elements are therefore the basis for much of the coordinated work of scientists around the world to establish the biological wealth within ecosystems and thereby consolidate conservation efforts aimed, not only at protecting the natural environment but also at making its sustainable use possible. Our long-term survival depends on it.

Nevertheless the number of species that exists globally is unknown. Some estimate the total number of species at between 5 and 30 million (HMSO 1995), while others believe it to be between 10 and 100 million (Reaka-Kudla *et al.* 1997). We can see from these figures a remarkable disparity, which emphasises the level of our current knowledge.

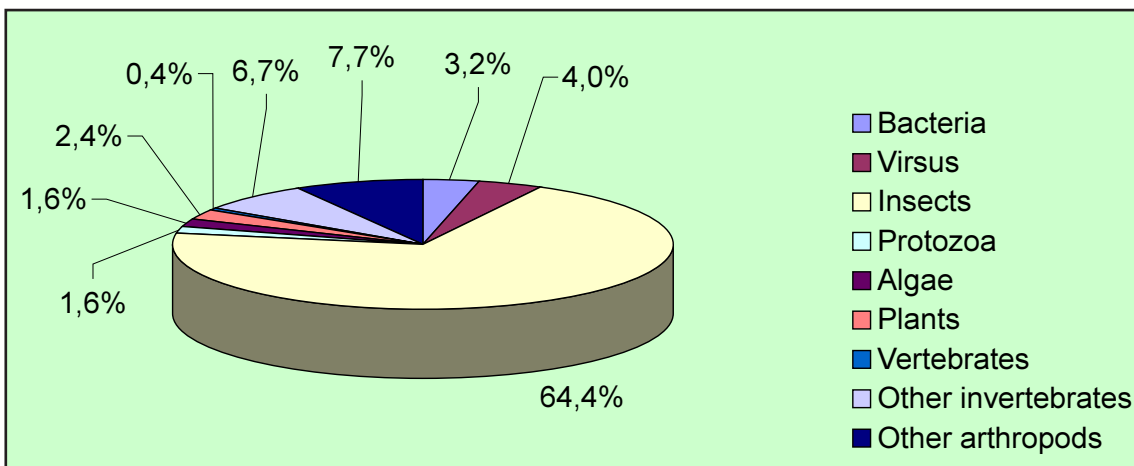


Figure 1. Estimated percentage of species from different groups of organisms thought to exist, as a proportion of the global total. (Source: 'Biodiversity: The UK Steering Group Report'. (1995)).

Notwithstanding this, some countries have achieved substantial progress in cataloguing their Biodiversity. This is particularly useful when applying these same findings towards Biodiversity action plans. In the United Kingdom, as elsewhere, microbial organisms such as bacteria and protozoa are less well known than invertebrates. However, the larger, more visible and attractive taxonomic groups, such as flowering plants and vertebrates have been intensively studied and have received more attention. Many British invertebrate groupings have also been studied intensively but every taxonomic group deserves equal attention.

A sound knowledge of local faunas is essential for conserving native species. Some require monitoring to assess their specific requirements, establish their populations and determine their status at local and national levels. This can only be done by identifying which habitats they occupy and the threats that these are subject to, which can then be addressed.

Table 1: Numbers of terrestrial and freshwater species in the UK compared with recent global estimates of described species in major groups.

Group	British species	World species
Bacteria	Unknown	>4,000
Viruses	Unknown	>5,000
Protozoa	>20,000	>40,000
Algae	>20,000	>40,000
Fungi	>15,000	>70,000
Ferns	80	>12,000
Bryophytes	1,000	>14,000
Lichens	1,500	>17,000
Flowering Plants	1,500	>250,000
Non-arthropod invertebrates	>4,000	>90,000
Insects	22,500	>1,000,000
Arthropods other than insects	>3,500	>190,000
Freshwater fish	38	>8,500
Amphibians	6	>4,000
Reptiles	6	>6,500
Breeding birds	210	9,881
Wintering birds	180	n/a
Mammals	48	4,327
Total	c.88,000	c.1,770,000

Source: - 'Biodiversity: The UK Steering Group Report'. (1995).

It is necessary to realise that Biodiversity, although associated with species diversity to a great degree, also encompasses the interrelationship between species and their habitat. This link is of vital importance since it is what has promoted the gradual evolution through time of new varieties and species. So far, this natural process has only been disrupted occasionally through abrupt but natural climatic changes, some of them resulting from catastrophic events such as asteroid impacts. However, we are now aware that today, global Biodiversity is gravely threatened by human activity.

The realisation that biodiversity is declining, noted by scientists all around the world, prompted many countries to take action. This led to the Earth Summit in Rio de Janeiro in June 1992, where the Convention on Biodiversity was established.

The Biodiversity Convention.

The term 'BioDiversity', as it was initially written, was first used during the 'National Forum on BioDiversity', held in Washington during September 1986, under the auspices of the National Academy of Sciences and the Smithsonian Institution (Reaka-Kudla *et al.* 1997). In 1992, at the Earth Summit in Rio de Janeiro, 167 countries became signatories to the Convention on Biological Diversity, and by 1993, 41 countries had ratified it. This was the first time that a large majority of the world's states had come togeth-

er and agreed on a legal instrument that would commit them to using biological resources sustainably and conserving biodiversity. This Convention had global perspectives. All the states realised that the problems that affect the global environment have to be addressed by all countries of the world for the benefit, and indeed survival, of mankind.

The three main objectives of the Convention are in Article 1:

- the conservation of biodiversity at the genetic, species and ecosystem levels.
- the sustainable use of its components; and
- the fair and equitable sharing of benefits derived from the use of genetic resources.

The United Kingdom was a signatory of the Convention on Biological Diversity and Gibraltar, as a territory of the UK, is obliged to adopt the Convention and comply with and enforce its goals and objectives. The United Kingdom launched 'Biodiversity: The UK Action Plan' in January 1994, and established representatives for a Biodiversity Steering Group from key sectors chaired by the Department of the Environment who would oversee the following tasks: -

- Developing costed targets for key species and habitats.
- Suggesting ways of improving the accessibility and coordination of information on Biodiversity.
- Recommending ways of increasing public awareness and involvement in conserving Biodiversity.
- Recommending ways of ensuring that commitments in the plan were properly monitored and carried out; and
- Publishing findings before the end of 1995.

The Group was selected to represent regional and local Government from private and public sectors, academic bodies, collections, business, agriculture, landowners, and conservation NGOs. Primarily in an advisory capacity, the proposals contained within the report were then submitted to Government for action (HMSO 1995).

Gibraltar.

The United Kingdom, with responsibility for Gibraltar, published these findings in their 'Biodiversity: The UK Steering Group Report' Volumes I and II (HMSO 1995), where they refer to Gibraltar in 'Annex B' under the 'Dependent Territories Progress Report'.



Figure 2: Gibraltar viewed from the south. Courtesy Gibraltar Tourist Board.

Gibraltar figures in the UK Steering Group Report as ecologically significant and sensitive, stemming from its location on a major migration route, with very substantial flora for its area and important marine biological assets, but vulnerable because of its small area with a high population. The Steering Group recognised the sound, scientifically based work that has been carried out in Gibraltar over a number of years and they welcome the implementation of the 'Nature Protection Ordinance, 1991' and the creation of the Upper Rock Nature Reserve, together with transposition of EU directives. They also state that Gibraltar has implemented the Habitats Directive (the Directive has been transposed into the laws of Gibraltar (Part II A, LN 118 of 1995), but the designation of Natura 2000 sites is pending).

The report recognises the excellent human resources backing the conservation efforts in the form of the Gibraltar Ornithological & Natural History Society and the partnership that exists between this organisation and the Gibraltar Government, providing expert advice and preparing reports. It also mentions that Gibraltar was being considered as a location for one of the global Geographical Observatories under a programme initiated by the Royal Geographical Society, and refers to lack of funding for biodiversity conservation as the main problem facing Gibraltar in this context.

The Significance of Biodiversity.

We have discussed the meaning of Biodiversity and how numerous countries worldwide are now committed to improving the quality and quantity of their fauna and flora, in order to ensure that future generations will be able to inherit a healthy environment. However, during the recent history of mankind the uncontrolled use, and in many cases the abuse of the Earth's ecosystems, have led to a degradation of the land, the seas and the air. Species-loss has been severe and irreversible in every part of the globe, and mankind has largely ignored the interdependency of living organisms, leading to a collapse in the balance of nature and an impoverishment of biological resources for the future.

The use and abuse of unsustainable resources has resulted in many natural catastrophes around the world including increased desertification in many areas and the depletion of the ozone layer over both poles. It has also led to the realisation that mankind is affecting the weather systems through climatic change, including global warming, leading to sudden short term alterations in ecosystems that are too rapid for evolutionary adjustments to keep up. If such climate change is allowed to continue, this will eventually result in dramatic loss of biodiversity.

Humans are dependent on the terrestrial and marine environments for all our requirements. However, the increasing demands placed on these ecosystems and the continued growth of the human population has placed increased pressures to augment the rate of production of commodities. This has resulted in the loss of much of our natural environment, and has brought about the realisation by many that if we do not conserve our Biodiversity, the long-term future of the human species will be in doubt.

So why conserve Biodiversity?

- 1) Primarily we have an obligation to future generations. We have created most of the recent dramatic changes in our ecosystems and, as custodians, are responsible for ensuring that these same ecosystems do not suffer continual degradation and that the biodiversity of these systems is conserved.
- 2) There are also ethical and aesthetic implications. The environment, together with its habitats and species living within the same, enriches our lives in a variety of ways. We have all heard our older relatives say at one time or another, *"I remember how beautiful this place used to look like, before it ..."*
- 3) Each species has a particular value and plays a particular role in nature. Many animals and plants are directly useful to us and ever more beneficial species are steadily being discovered. Crop plants and domestic animals are the most obvious examples. In addition, there are those which rid us of pests that would otherwise eat our crops or spread disease. Others provide us with medicinal remedies for a multitude of ailments. Still more provide building material, act as water filters or prevent erosion. A whole range of bacteria and plant species are vital to the nutrient cycles, such as the circulation of nitrogen, which make any life on earth possible. Green plants provide us with the very oxygen we breathe.

- 4) Biodiversity has direct economic value. The development of national Parks and nature reserves around the world and increasing interest in the wildlife has generated the industry of Ecotourism, which is bringing great economic benefits to many countries.

Threats to Biodiversity

Many major threats worldwide affect Biodiversity. The most important ones include:

- Overpopulation: leading to ever-increasing demands for food, water and living space, and increased pollution, all at the expense of natural environments.
- Habitat destruction, especially deforestation
- Greenhouse gas emission: of carbon dioxide and methane, potentially contributing to global warming including climate change.
- Over-harvesting of potentially sustainable resources: over-fishing especially.
- Urbanisation of natural habitats
- Non-sustainable use of water.
- Loss of genetic diversity among crop plants and animals.
- Impacts of alien species on indigenous communities: the extinction of island bird communities by introduced rats and snakes is a prime example.
- Trade in endangered species: such as tigers and rhinoceroses, and in their products: such as ivory and whale-meat.

The two most notable are habitat loss and pollution. These issues are most frequently associated with the felling and burning of tropical forests and the emission of greenhouse gases into the atmosphere.

These two account for the most significant changes that have occurred recently. The results of the gases and the depletion of the large masses of oxygen-producing forests have resulted in a slight but significant increase in the temperature of the planet. This has led to substantial changes in some ecosystems. Glaciers have retreated and in some places disappeared altogether. The ice-sheets around the poles have been gradually thinning and shrinking. Temperatures in the waters of the east Pacific show an increase that affects the fluctuations that give rise to the phenomena called 'El Niño' and 'La Niña'. Their power appears to have intensified as a result of this increase, and this has been the cause of torrential rains in coastal South America, while at the same time causing the failure of the monsoon rains in the Indian sub-continent, and extensive droughts in eastern Australia triggering immense forest fires. Temperature increases in the mid Atlantic have spawned larger, more frequent and more ferocious hurricanes affecting the Caribbean, the Gulf of Mexico and the southern states of the United States. Likewise there has been an increase in the quantity and ferocity of typhoons affecting the eastern seaboard of Asia (IPCC 2001).

These are some of the major 'natural catastrophes' that make the headlines. Each causes human tragedies, destruction, homelessness, strife, starvation, diseases and general despair. It is usually measured in countless millions of dollars, but that only quantifies the human losses. What about the irreparable losses to habitats and the deaths of whole communities of plants and animals? These never make the headlines, but the tragedy is just as serious and in many cases worse. Agricultural and farming practices rely on ecological conditions, and these may be affected by a loss of habitats and biodiversity.

This is the time for mankind to wake up and realise that we are not alone on this planet. That the planet is not endowed with an infinite supply of raw materials and that our actions have far more long-term effects than we ever realised.

It is only in the last 30 years that we have begun to realise that the continual harvesting of certain commodities has exceeded the natural regeneration rate. This has resulted in the depletion of certain species, one of which led to the infamous 'Cod Crisis' in North Atlantic waters in the 1970's and the establishment of a quota system, which has nevertheless been unsuccessful, due to unscrupulous fishing practices and quota bypassing elements (Nielsen & Mathiesen 2003). Another example is the uncontrolled felling of hardwood timber and the establishment of import bans which many countries do not apply or enforce, while others turn a blind eye, and encourage the countries of origin to part with their rich tropical forests. These are just some examples that have driven major countries to adopt a policy of sustainability, in which stocks of certain commodities will only be harvested on the basis that there will always be sufficient left to ensure that future stocks are assured.

There are also the threats to habitats, where building pressures for development and the expansion of

major towns and cities have sown the destruction of many of our green areas and wetland habitats. If we take into account that during the early part of the last millennium most of the transport system consisted of either horse-drawn carriage or waterborne vessels, and this last method was the most efficient, it is then not surprising that most towns and cities were located on major waterways and coastal locations. The rivers acted not only as navigational routes but also for the provision of water and the disposal of effluent. Over the centuries these cities have grown, taking in the flat terrain of the riversides and floodplains to expand. Cities like London have taken up an enormous area of the Thames valley and with it industrial sites have benefited from the proximity to rivers, initially to run machinery and dump waste but mainly as a transport waterway. These rivers have been polluted to a great extent, diminishing the wildlife of these wetland ecosystems. Marshes have been drained, peat bogs have been cleared and estuaries have been reclaimed and their rivers channelled. There has been a drastic reduction of wetlands in the northern hemisphere in the last 200 years, with a large percentage of these extremely diverse habitats disappearing in recent times, to be turned over to agriculture.

Unsound agricultural practices, with mounting pressures to increase demand for an expanding population have resulted in rampant deforestation and destruction of natural habitats. In many areas, only small pockets of isolated natural areas that are unsuitable for farming remain. These are insufficient to contain a viable thriving community of plants and animals, and studies have shown that small, isolated populations do not survive for very long. Monoculture techniques over large areas have also limited the variability of species and have opened up a niche for pest species to target. Ironically, this has led to unnatural control with pesticides and herbicides that have wiped out not only the pest species, but other beneficial species that could have been used as a natural control. Here again we see the destruction of Biodiversity at the level of habitats and species without consideration for the future exploitation of these resources, and carried out in a totally unsustainable manner.

There is also the use of unsustainable energy sources in the form of fossil fuels, which are extracted from the mantle of the planet, leaving behind profound scars in the landscape and contaminating everything it comes into contact with. The extraction of coal in the early 20th century gave way to oil when it became apparent that resources of the latter were uneconomical to extract and running low. The industrial revolution in the 1800's spurred the need for unlimited supplies of fuel, which in turn produced the smog-laden air of that time and initiated the contamination of the earth's atmosphere. When oil replaced coal, industry had already evolved at a relentless pace, and with the invention of the combustion engine, oil and its derivatives became the answer to the world's energy problems.

Although essential at the time for the modernisation of society, the unrelenting use of unsustainable energy resources has invariably affected Biodiversity through contamination and pollution of many natural ecosystems. It is time for mankind to seek more environmentally stable and sustainable renewable forms of energy to redress this loss.



Figure 3: Atmospheric pollution from the Spanish Refinery to the north of Gibraltar.

The introduction of alien and/or invasive species is another aspect that has seriously affected the Biodiversity of our planet. In the age of discovery, when adventurers set sail to discover new lands, they took with them cats to control vermin, namely the black rat, *Rattus rattus*, that regularly travelled on these ships. Both these species were to find their way onto dry land, in areas of the world that were basically virgin territory to these two species. Here, without any natural controlling factors, the two proliferated and preyed on or excluded the native species. In many parts of the world these two species have exterminated and caused the extinction of the most number of species, other than man. In New Zealand, where there was a rich native population of flightless birds, cats and rats took an immense toll on the avifauna, completely exterminating many species. Even today there are certain islands in the Pacific Ocean where there is a current extermination programme of cats and rats, in order to save the native population of seabirds. There are many other similar examples.

We can see the damage done to ecosystems when there are no natural predators to control animals, but what can one do when the alien species is not an animal but a plant? Few people realise the problems that an invasive plant can cause, yet the introduction of plant species in an area where there again is no natural controlling factor, is a recipe for disaster. It was common practise for the sailors returning from exotic locations to bring back colourful and exotic plants and flowers. Many did not survive the harsh northern European climate except in greenhouses, under artificial conditions. Yet some fared better and proliferated escaping through wind blown seed and other means into the wild, where they established successful colonies and pushed out native species. An example can be found in the UK where the *Rhododendron ponticum* has invaded and become a pest species.

These are some of the major threats that affect our Biodiversity. Some are spurred on by necessity, for want of a mouthful today, others through greed. Nevertheless many threats occur through ignorance: ignorance of the fact that what we do as an individual will not affect all of us on this planet. Yet we are all linked together in one way or another, from the smallest virus and bacterium to the largest animals. We humans often believe that we are leaders in the evolutionary ladder. But a leader has responsibilities, and since we have created most of the dramatic changes that have taken place on our planet we have a moral obligation to put this right.

The Gibraltar Action Plan

This Plan highlights the importance of biodiversity in Gibraltar and aims to provide specific habitat and species action plans that will address the overall goal for Gibraltar's Biodiversity requirements. This is:

“To conserve and enhance biological diversity within Gibraltar and to contribute to the conservation of global biodiversity through all appropriate mechanisms.”

The objectives of the Biodiversity Action Plan, within both our terrestrial and marine ecosystems, are therefore:

- To sustain the existing biodiversity of natural and semi-natural habitats where this has been declining.
- To conserve internationally important, threatened and vulnerable species and habitats.
- To sustain the populations and distribution of native species.
- To conserve and improve the quality of natural habitats.
- To increase total biodiversity, by reintroducing locally extinct species.
- To restore natural habitats by controlling and eradicating alien species.

The Gibraltar Biodiversity Project will establish and identify key species and habitats and will provide the bases for the necessary nature conservation programmes and tasks. These will need to be tackled by the Gibraltar Government and their agencies, in consultation and in partnership with existing environmental NGO's and will require the collaboration of developers and other stakeholders.

The programmes will require costed targets for threatened species and habitats that will include research and monitoring, increasing public awareness and involving other key sectors.

Such programmes will address the requirements for conserving the biodiversity of Gibraltar and will reveal what is required to tackle other important environmental issues.



2. The International Context

Gibraltar Neanderthals

2. The International Context

The survival of much of Europe's natural environment, its fauna, flora and habitats were under unremitting and increasing threats and all had deteriorated substantially by the mid to late 1900's. One of the European Union's primary tasks was to halt the increasing threats to habitats, prevent species loss, and protect and conserve Europe's biodiversity. Through a continuous process of developing environmental legislation, with the application of European Directives addressing threatened species and habitats, and the establishment of networks of protected areas, the European Union and its Member States have come a long way in the process of achieving these objectives. Nevertheless this is an ongoing process that requires continual monitoring, evaluation and reporting, and one that benefits from public participation. Organisations such as the World Conservation Union (IUCN) are continually monitoring wildlife and have also assessed the need to protect species at a global level and published the IUCN Red List Criteria. They have also made recommendations that have led to international agreements such as CITES (the Convention on the International Trade in Endangered Species) that have been ratified by the United Kingdom and apply to Gibraltar. Birdlife International is another organisation that has also assessed the status of Europe's avifauna in their publications *Birds in Europe I* (Tucker & Heath 1994) and *Birds in Europe II* and established two Important Bird Areas (IBAs) for Gibraltar (Birdlife International 2004). Their assessment, and those of IUCN and other organisations dealing with the protection of wildlife on a global scale, complements EU Regulations and Directives by providing the mechanisms for the establishment of protected areas and the conservation of the habitats of endangered species.

Gibraltar, as a European Territory of the Member State (the United Kingdom) which has ratified these Conventions, Directives and Agreements, is obliged to conserve and protect its unique wildlife and habitats, and to implement the above measures.

Several international instruments apply in part or in full to the Territory of Gibraltar. Some deal specifically with certain groups of animals: for example, the EU Wild Birds Directive, the Convention on Migratory Species (CMS) and EUROBAT that aims to protect all European bat species. Others incorporate the protection of habitats as well as defining priority species in need of conservation, and have given rise to a series of environmentally important areas within Member States that form or will form networks of protected areas under the name of 'Natura 2000 Network' or 'The Emerald Network'. One particular agreement: 'ACCOBAMS', which deals only with the conservation of cetaceans within the Black and Mediterranean seas and the adjacent part of the Atlantic Ocean, was ratified by the United Kingdom in view of Gibraltar's location and has no direct relevance to the British Isles.

This chapter explains the main provisions and objectives that deal with species and their habitat requirements within these Conventions and Directives and sets out how the relevant measures apply to Gibraltar.

Table 1 lists the Conventions and agreements that have been ratified by the United Kingdom and that apply to Gibraltar.

Table 1: Main Environmental Conventions, Directives and Agreements dealing with wildlife that apply or have been transposed in Gibraltar.

EU Birds Directive	The Directive on the Conservation of Wild Birds 79/409/EEC
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals 82/461/EEC
Bonn Convention - EUROBATS	Agreement on the Conservation of Populations of European Bats
ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area
CITES	The Convention on the Trade in Endangered Species of Wild Flora and Fauna
World Heritage Convention	The Convention concerning the Protection of the World Cultural and Natural Heritage
EC Habitats Directive	The Conservation of Natural Habitats and Wild Fauna and Flora 92/43/EEC
Natura 2000 Network	A network of protected areas set up under the Birds and Habitats Directives
Biodiversity Convention	The Rio de Janeiro Convention on Biological Diversity 93/626/EEC

EU Birds Directive

The European Unions' Birds Directive came into force on 2 April 1979. It was incorporated into the United Kingdoms Wildlife and Countryside Act 1981 as the principle vehicle in implementing this Directive.

The Directive is divided into two main parts: habitat conservation and species protection. For rare and endangered species the Directive recommends the creation of protected areas by the implementation of Special Areas of Protection (SPAs), with the appropriate management and the creation of new habitats and restoration of existing habitats.

It also requests Member States to prohibit the deliberate killing of wild birds, damage to their nests or eggs, the taking or keeping of eggs of wild birds, and the keeping of wild birds and deliberate disturbance in their habitats especially during the breeding season.

Box 1 lists the main provisions that deal specifically with the protection of birds and their habitats.

1. Strictly for European wild birds and their habitats. Adapted from Birds in Europe (2004).

EU Wild Birds Directive (79/409/EEC)
<ul style="list-style-type: none"> • Article 1..... reports on the conservation of wild species of birds found naturally in the European territory of the Member States, and this applies to birds and includes their eggs, nests and their habitats. • Article 2..... calls for the Member State take adequate measures to maintain the stable population of the species referred to in Article 1 to a degree that incorporates the scientific, cultural and ecological requirements whilst taking into account economic and recreational requirements, or adapt the population of these species to that level.

- Article 4.1..... calls for the Member State to take special measures in habitat conservation to ensure the survival and reproduction of species listed in Annex I that are (a) in danger of extinction; (b) vulnerable to specific changes in their habitat; (c) considered rare, because of small populations or restricted local range; or (d) in need of particular attention, due to their specific requirement and nature of their habitat.
- Member States are required to classify suitable areas in number and size as 'Special Protection Areas' or SPAs, for the conservation of these species as well as regularly occurring migratory species, (covered in Article 4.2), taking into account their protection requirements in the terrestrial and marine areas where the Directive applies.
- Monitoring the changes in trends and population levels are also required by the Directive for the purpose of evaluating the conservation of species within the Member States

The Directive lists the 181 wild bird species that are classified as in need of protection under Annex I. Annex I species of the Directive are the subject of special conservation measures to ensure their survival and reproduction in their areas of distribution. Member States also require to consider similar measures for regularly occurring migratory species not listed in Annex I, bearing in mind their need for protection in the geographical sea and land area where this Directive applies, as regards their breeding, moulting and wintering areas and staging posts along their migration routes.

In Gibraltar, the Birds Directive was incorporated under the Nature Protection Ordinance 1991 (LN 11 of 1991), which affords protection to all species of wild birds. Some of the wild birds that have been recorded in Gibraltar, as resident, summer or winter visitors, or on migration, include 88 species that are included in the Birds Directive under Annex I and these are the subject of European special conservation measures. They represent 48.6% of the bird species in Annex I. Gibraltar bird species that figure in Annex 1 are listed in Table 2.

Table 2: Local status of bird species listed in Annex I of Council Directive 79/409/EEC that have been recorded in Gibraltar.

Name	Population			Stage
	Resident	Breed	Migratory Winter	
<i>Aegypius monachus</i>				1-5i
<i>Alcedo atthis</i>			1-5i	1-5i
<i>Alectoris barbara</i>	50p			
<i>Anthus campestris</i>				11-50i
<i>Bubo bubo</i>	1p			
<i>Calandrella brachydactyla</i>				1-5i
<i>Calonectris diomedea</i>				>10000i
<i>Caprimulgus europaeus</i>				6-10i
<i>Chlidonias niger</i>				101-250i
<i>Ciconia ciconia</i>				251-500i
<i>Ciconia nigra</i>				11-50i
<i>Circaetus gallicus</i>				251-500i
<i>Circus aeruginosus</i>				101-250i
<i>Circus cyaneus</i>				1-5i
<i>Circus pygargus</i>				101-250i
<i>Emberiza hortulana</i>				11-50i
<i>Falco columbarius</i>				1-5i
<i>Falco eleonorae</i>				6-10i
<i>Falco naumanni</i>		11-15p		11-50i
<i>Falco peregrinus</i>	6-10p			
<i>Falco tinnunculus</i>	5p			51-100i
<i>Gelochelidon nilotica</i>				1-5i
<i>Gyps fulvus</i>				51-100i
<i>Hieraaetus fasciatus</i>				1-5i
<i>Hieraaetus pennatus</i>			1-5i	251-500i
<i>Larus audouinii</i>			51-100i	1001-10000i
<i>Larus melanocephala</i>			11-50i	501-1000i
<i>Lullula arborea</i>				1-5i
<i>Luscinia svecica</i>				1-5i
<i>Melanitta nigra</i>				11-50i
<i>Milvus migrans</i>				>10000i
<i>Neophron percnopterus</i>				51-100i
<i>Oceanodroma leucorhoa</i>			11-50i	51-100i
<i>Pandion haliaetus</i>				11-50i

i = individuals; p = pairs.

Name	Population			Stage
	Resident	Breed	Migratory Winter	
<i>Pernis apivorus</i>				>10000i
<i>Ph. aristotelis desmaresti</i>	5p			
<i>Ph. carbo sinensis</i>			1-5i	
<i>Puffinus mauretanicus</i>			11-50i	1001-10000i
<i>Sterna albifrons</i>				6-10i
<i>Sterna caspia</i>				1-5i
<i>Sterna hirundo</i>				11-50i
<i>Sterna sandvicensis</i>			11-50i	251-500i
<i>Sylvia undata</i>			11-50i	11-501

i = individuals; *p* = pairs.

Table 3: Bird Species listed in Annex I of the Birds Directive 79/409/EEC that have been recorded in Gibraltar.

Latin name	Species	Latin name	Species
<i>Gavia stellata</i>	Red-throated Diver	<i>Alectoris barbara</i>	Barbary Partridge
<i>Gavia immer</i>	Great Northern Diver	<i>Porphyrio porphyrio</i>	Purple Gallinule
<i>Calonectris diomedea</i>	Cory's Shearwater	<i>Grus grus</i>	Crane
<i>Puffinus mauretanicus</i>	Balearic Shearwater	<i>Otis tarda</i>	Great Bustard
<i>Puffinus assimilis</i>	Little Shearwater	<i>Himantopus himantopus</i>	Black-winged Stilt
<i>Hydrobates pelagicus</i>	Storm Petrel	<i>Recurvirostra avosetta</i>	Avocet
<i>Oceanodroma leucorhoa</i>	Leach's Storm-petrel	<i>Burhinus oedicnemus</i>	Stone Curlew
<i>Phalacrocorax aristotelis desmarestii</i>	Shag (Mediterranean sub-species)	<i>Glareola pratincola</i>	Collared Pratincole
<i>Ixobrychus minutus</i>	Little Bittern	<i>Pluvialis apricaria</i>	Golden Plover
<i>Nycticorax nycticorax</i>	Night Heron	<i>Limosa lapponica</i>	Bar-tailed Godwit
<i>Ardeola ralloides</i>	Squacco Heron	<i>Larus melanocephalus</i>	Mediterranean Gull
<i>Egretta garzetta</i>	Little Egret	<i>Larus genei</i>	Slender-billed Gull
<i>Ardea purpurea</i>	Purple Heron	<i>Larus audouinii</i>	Audouin's Gull
<i>Ciconia nigra</i>	Black Stork	<i>Gelochelidon nilotica</i>	Gull-billed Tern
<i>Ciconia ciconia</i>	White Stork	<i>Sterna caspia</i>	Caspian Tern
<i>Plegadis falcinellus</i>	Glossy Ibis	<i>Sterna sandvicensis</i>	Sandwich Tern
<i>Platalea leucorodia</i>	Spoonbill	<i>Sterna dougallii</i>	Roseate Tern
<i>Phoenicopterus roseus</i>	Greater Flamingo	<i>Sterna hirundo</i>	Common Tern
<i>Pernis apivorus</i>	Honey Buzzard	<i>Sterna paradisaea</i>	Arctic Tern
<i>Elanus caeruleus</i>	Black-shouldered Kite	<i>Sterna albifrons</i>	Little Tern
<i>Milvus migrans</i>	Black Kite	<i>Chlidonias hybridus</i>	Whiskered Tern
<i>Milvus milvus</i>	Red Kite	<i>Chlidonias niger</i>	Black Tern
<i>Gypaetus barbatus</i>	Bearded Vulture	<i>Pterocles alchata</i>	Pin-tailed Sandgrouse
<i>Neophron percnopterus</i>	Egyptian Vulture	<i>Bubo bubo</i>	Eagle Owl
<i>Gyps fulvus</i>	Griffon Vulture	<i>Asio flammeus</i>	Short-eared Owl
<i>Aegypius monachus</i>	Black Vulture	<i>Caprimulgus europaeus</i>	Nightjar
<i>Circaetus gallicus</i>	Short-toed Eagle	<i>Apus caffer</i>	White-rumped Swift
<i>Circus aeruginosus</i>	Marsh Harrier	<i>Alcedo atthis</i>	Kingfisher
<i>Circus cyaneus</i>	Hen Harrier	<i>Coracias garrulus</i>	Roller
<i>Circus macrourus</i>	Pallid Harrier	<i>Melanocorypha calandra</i>	Calandra Lark
<i>Circus pygargus</i>	Montagu's Harrier	<i>Calandrella brachydactyla</i>	Short-toed Lark
<i>Buteo rufinus</i>	Long-legged Buzzard	<i>Galerida theklae</i>	Thekla Lark
<i>Aquila pomarina</i>	Lesser Spotted Eagle	<i>Lullula arborea</i>	Woodlark
<i>Aquila clanga</i>	Greater Spotted Eagle	<i>Anthus campestris</i>	Tawny Pipit
<i>Aquila adalberti</i>	Spanish Imperial Eagle	<i>Luscinia svecica</i>	Bluethroat
<i>Aquila chrysaetos</i>	Golden Eagle	<i>Oenanthe leucura</i>	Black Wheatear
<i>Hieraetus pennatus</i>	Booted Eagle	<i>Sylvia sarda</i>	Marmora's Warbler
<i>Hieraetus fasciatus</i>	Bonelli's Eagle	<i>Sylvia undata</i>	Dartford Warbler
<i>Pandion haliaetus</i>	Osprey	<i>Ficedula parva</i>	Red-breasted Flycatcher
<i>Falco naumanni</i>	Lesser Kestrel	<i>Lanius collurio</i>	Red-backed Shrike
<i>Falco columbarius</i>	Merlin	<i>Pyrhcorax pyrrhcorax</i>	Chough
<i>Falco eleonorae</i>	Eleonora's Falcon	<i>Bucanetes githagineus</i>	Trumpeter Finch
<i>Falco biarmicus</i>	Lanner Falcon	<i>Emberiza hortulana</i>	Ortolan Bunting
<i>Falco peregrinus</i>	Peregrine		

Table 4: Local status of regularly occurring migratory birds not listed in Annex I of the Birds Directive.

Name	Population			Stage
	Resident	Breed	Migratory Winter	
<i>Accipiter nisus</i>				101-250i
<i>Anthus pratensis</i>			51-100i	501-1000i
<i>Anthus trivialis</i>				50-100i
<i>Alca torda</i>			11-50i	1001-10000i
<i>Apus apus</i>		2000p		>10000i
<i>Apus melba</i>		25p		251-500i
<i>Apus pallidus</i>		2000p		1001-10000i
<i>Buteo buteo</i>			1-5i	251-500i
<i>Calandrella rufescens</i>				11-50i
<i>Caprimulgus ruficollis</i>				6-10i
<i>Carduelis cannabina</i>			11-50i	1001-10000i
<i>Carduelis carduelis</i>			51-100i	1001-10000i
<i>Carduelis chloris</i>	15p		51-100i	1001-10000i
<i>Carduelis spinus</i>			11-50i	251-500i
<i>Catharacta skua</i>			6-10i	101-250i
<i>Cercotrichias galactotes</i>				1-5i
<i>Certhia brachydactyla</i>				6-10i
<i>Cisticola juncidis</i>	1-5p		11-50i	101-50i
<i>Coturnix coturnix</i>				11-50i
<i>Cuculus canorus</i>				6-10i
<i>Delichon urbica</i>		6-10p		1001-10000i
<i>Erithracus rubercula</i>	1-5p		251-500i	1001-10000i
<i>Falco subbuteo</i>				11-50i
<i>Ficedula hypoleuca</i>				251-500i
<i>Fratercula arctica</i>				1001-10000i
<i>Fringilla coelebs</i>	1-5p		101-250i	1001-10000i
<i>Galerida cristata</i>			1-5i	11-50i
<i>Hippolais pallida</i>				1-5i
<i>Hippolais polyglotta</i>				1001-10000i
<i>Hirundo daurica</i>				51-100i
<i>Hirundo rustica</i>				1001-10000i
<i>Jynx torquilla</i>			1-5i	51-100i
<i>Lanius excubitor</i>				1-5i
<i>Lanius senator</i>				101-250i
<i>Larus fuscus</i>			51-100i	1001-10000i
<i>Larus ridibundus</i>			251-500i	1001-10000i
<i>Locustella naevia</i>				11-50i
<i>Luscinia megarhynchos</i>				1001-10000i
<i>Merops apiaster</i>				1001-10000i
<i>Miliaria calandra</i>			1-5i	51-100i
<i>Motacilla alba</i>			101-250i	501-1000i
<i>Motacilla cinerea</i>			11-50i	501-1000i
<i>Motacilla flava</i>				501-1000i
<i>Muscicapa striata</i>				501-1000i
<i>Oenanthe hispanica</i>				251-1000i
<i>Oenanthe oenanthe</i>				251-1000i
<i>Oriolus oriolus</i>				11-50i
<i>Otus scops</i>				6-10i
<i>Phoenicurus ochrurus</i>			501-1000i	1001-10000i
<i>Phoenicurus phoenicurus</i>				1001-10000i
<i>Phylloscopus bonelli</i>				1001-10000i
<i>Phylloscopus collybita</i>			501-1000i	1001-10000i
<i>Phylloscopus trochilus</i>				1001-10000i
<i>Prunella collaris</i>			11-50i	
<i>Prunella modularis</i>			11-50i	
<i>Ptyonoprogne ruprestis</i>			251-500i	1001-10000i
<i>Puffinus gravis</i>				1-5p
<i>Puffinus griseus</i>				6-10i
<i>Regulus ignicapillus</i>			11-50i	
<i>Riparia riparia</i>				51-100i
<i>Saxicola rubetra</i>				51-100i
<i>Saxicola torquata</i>			11-50i	101-250i
<i>Scolopax rusticola</i>			1-5i	1-5i

i = individuals; *p* = pairs.

Name	Population		
	Resident	Breed	Migratory Winter Stage
<i>Serinus serinus</i>	1-5p		11-50i 251-500i
<i>Stercorarius parasiticus</i>			6-10i
<i>Stercorarius pomarinus</i>			1-5i
<i>Sterna bengalensis</i>			1-5i
<i>Sterna maxima</i>			1-5i
<i>Sturnus vulgaris</i>			1001-10000i P
<i>Sylvia atricapilla</i>	251-500p		501-1000i 1001-10000i
<i>Sylvia borin</i>			501-1000i
<i>Sylvia cantillans</i>			101-250i
<i>Sylvia communis</i>			101-250i
<i>Sylvia conspicillata</i>			6-10i
<i>Sylvia hortensis</i>			51-100i
<i>Sylvia melanocephala</i>	251-500p		P
<i>Sula bassana</i>			101-250i 1001-10000i
<i>Turdus iliacus</i>			11-50i
<i>Turdus merula</i>	251-500p		
<i>Turdus philomelos</i>			51-100i 501-1000i
<i>Turdus torquatus</i>			11-50i
<i>Turdus viscivorus</i>			1-5i 1-5i
<i>Upupa epops</i>			51-100i

i = individuals; *p* = pairs.

Regularly occurring migratory species not listed in Annex I of the Birds Directive require the Member States to adopt similar measures to Annex I species, bearing in mind the need for protection in the geographical maritime and terrestrial area where this Directive applies, as regards their breeding, wintering and moulting areas, and staging posts along their migratory routes.

The Bonn Convention. Convention on the Conservation of Migratory Species.

The Bonn Convention, also known as the Convention on the Conservation of Migratory Species of Wild Animals (or CMS) aims to conserve terrestrial, marine and avian migratory species throughout their range. It was concluded on the 1 November 1983 under the auspices of the United Nations Environment Programme, and is concerned with the conservation of wildlife and habitats on a global scale.

The objective of this Convention is the conservation of migratory species of wildlife worldwide. The parties to the Convention are required to pay special attention to species whose conservation status is unfavourable, and has to endeavour to apply the following main provisions.

The Bonn Convention or The Convention on the Conservation of Migratory Species of Wild Animals (CMS). Main provisions.

- to promote, cooperate in or support research relating to migratory species.
- to provide immediate protection to migratory species included in Appendix I
- to conclude agreements covering the conservation and management of migratory species listed in Appendix II
- to conserve or restore the habitats of endangered species.
- to prevent, remove, compensate for or minimise the adverse effects of activities or obstacles that impede the migration of the species.
- to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species.

Appendix I of the Convention includes a list of Migratory species which are endangered in Europe. Appendix 2 lists migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement.

Species recorded in Gibraltar and classified under Appendix I and II of the CMS are listed in the following tables.

Table 5: Migratory species of wild animals, recorded in Gibraltar that are included in Appendix I of the Bonn Convention.

Birds	Spotted Eagle	<i>Aquila clanga</i>
	Spanish Imperial Eagle	<i>Aquila adalberti</i>
	Lesser Kestrel	<i>Falco naumanni</i>
	Audouin's Gull	<i>Larus audouinii</i>
Reptiles	Atlantic Green Turtle	<i>Chelonia mydas</i>
	Loggerhead Turtle	<i>Caretta caretta</i>
	Leatherback Turtle	<i>Dermochelys coriacea</i>
Fish	White Shark	<i>Carcharodon carcharias</i>

Table 6: Migratory species of wild animals recorded in Gibraltar that are included in Appendix II of the Bonn Convention.

Mammals	Horseshoe Bats	<i>Rhinolophidae spp.</i>
	Mouse-eared Bat	<i>Myotis myotis</i>
	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>
	Schreiber's Bat	<i>Miniopterus schreibersii</i>
	European Free-tailed Bat	<i>Tadarida teniotis</i>
	Sperm Whale	<i>Physeter macrocephalus</i>
	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>
	Striped Dolphin	<i>Stenella coeruleoalba</i>
	Common Dolphin	<i>Delphinus delphis</i>
	Killer Whale	<i>Orcinus orca</i>
Birds	Red-throated Diver	<i>Gavia stellata</i>
	Great Northern Diver	<i>Gavia immer immer</i>
	Black-necked Grebe	<i>Podiceps auritus</i>
	Black Stork	<i>Ciconia nigra</i>
	White Stork	<i>Ciconia ciconia</i>
	Glossy Ibis	<i>Plegadis falcinellus</i>
	Greater Flamingo	<i>Phoenicopterus roseus</i>
	Grey Lag Goose	<i>Anser anser</i>
	Shelduck	<i>Tadorna tadorna</i>
	Wigeon	<i>Anas penelope</i>
	Shoveler	<i>Anas platyrhynchos</i>
	Gadwall	<i>Anas strepera</i>
	Pintail	<i>Anas acuta</i>
	Teal	<i>Anas crecca</i>
	Garganey	<i>Anas querquedula</i>
	Common Scoter	<i>Melanitta nigra</i>
	Red-breasted Merganser	<i>Mergus serrator</i>
	Honey Buzzard	<i>Pernis apivorus</i>
	Black-shouldered Kite	<i>Elanus caeruleus</i>
	Black Kite	<i>Milvus migrans</i>
	Red Kite	<i>Milvus milvus</i>
	Lammergeier	<i>Gypaetus barbatus</i>
	Egyptian Vulture	<i>Neophron percnopterus</i>
Griffon Vulture	<i>Gyps fulvus</i>	

	Black Vulture	<i>Aegypius monachus</i>
	Short-toed Eagle	<i>Circaetus gallicus</i>
	Marsh Harrier	<i>Circus aeruginosus</i>
	Hen Harrier	<i>Circus cyaneus</i>
	Pallid Harrier	<i>Circus macrourus</i>
	Montagu's Harrier	<i>Circus pygargus</i>
	Goshawk	<i>Accipiter gentilis</i>
	Sparrowhawk	<i>Accipiter nisus</i>
	Buzzard	<i>Buteo buteo</i>
	Long-legged Buzzard	<i>Buteo rufinus</i>
	Lesser-spotted Eagle	<i>Aquila pomarina</i>
	Spotted Eagle	<i>Aquila clanga</i>
	Spanish Imperial Eagle	<i>Aquila adalberti</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Booted Eagle	<i>Aquila pennata</i>
	Bonelli's Eagle	<i>Aquila fasciata</i>
	Osprey	<i>Pandion haliaetus</i>
	Lesser Kestrel	<i>Falco naumanni</i>
	Common Kestrel	<i>Falco tinnunculus</i>
	Merlin	<i>Falco columbarius</i>
	Hobby	<i>Falco subbuteo</i>
	Eleonora's Falcon	<i>Falco eleonora</i>
	Lanner	<i>Falco biarmicus</i>
	Peregrine	<i>Falco peregrinus</i>
	Quail	<i>Coturnix coturnix coturnix</i>
	Common Crane	<i>Grus grus</i>
	Great Bustard	<i>Otis tarda</i>
	Black-winged Stilt	<i>Himantopus himantopus</i>
	Avocet	<i>Recurvirostra avosetta</i>
	Stone Curlew	<i>Burhinus oedicephalus</i>
	Collared Pratincole	<i>Glareola pratincola</i>
	Ringed Plover	<i>Charadrius dubius</i>
	Little-ringed Plover	<i>Charadrius hiaticula</i>
	Kentish Plover	<i>Charadrius alexandrinus</i>
	Golden Plover	<i>Pluvialis apricaria</i>
	Grey Plover	<i>Pluvialis squatarola</i>
	Woodcock	<i>Scolopax rusticola</i>
	Mediterranean Gull	<i>Larus melanocephalus</i>
	Slender-billed Gull	<i>Larus genei</i>
	Audouin's Gull	<i>Larus audouinii</i>
	Gull-billed Tern	<i>Sterna nilotica nilotica</i>
	Caspian tern	<i>Sterna caspia</i>
	Royal tern	<i>Sterna maxima albidorsalis</i>
	Lesser-crested tern	<i>Sterna bengalensis</i>
	Sandwich Tern	<i>Sterna sandvicensis</i>
	Roseate tern	<i>Sterna dougalii</i>
	Little tern	<i>Sterna albifrons</i>
	Black Tern	<i>Chlidonias niger</i>
	White-winged Tern	<i>Chlidonias leucopterus</i>
	Turtle Dove	<i>Streptopelia turtur turtur</i>
	European Bee-eater	<i>Merops apiaster</i>
	European Roller	<i>Coracias garrulus</i>
	Pied Flycatcher	<i>Ficedula hypoleuca</i>
	Red-breasted Flycatcher	<i>Ficedula parva</i>
	Spotted Flycatcher	<i>Muscicapa striata</i>
Reptiles	Loggerhead Turtle	<i>Caretta caretta caretta</i>
	Atlantic Green Turtle	<i>Chelonia mydas mydas</i>
	Leatherback Turtle	<i>Dermochelys coriacea coriacea</i>
Fish	White Shark	<i>Carcharodon carcharias</i>
Insects	Monarch Butterfly	<i>Danaus plexippus</i>

EUROBATS

Bats have few natural enemies but many species are under threat from the way man has exploited and changed their natural habitats. Many of their traditional roost and breeding sites have been disturbed and lost and their feeding areas have been severely reduced. The degradation of the countryside and the exploitation of the forest and woodland areas, together with the uncontrolled use of pesticides, have resulted in bats being amongst the animals that have suffered most in recent times. Worldwide there are approximately 1,100 species of bats, many of which are endangered. This represents approximately 25% of all mammalian species on Earth.

EUROBAT entered into force on 16 January 1994. It was set up as part of the Bonn Convention and concluded under 'The Convention on the Conservation of Migratory Species of Wild Animals' and specifically under 'The Agreement on the Conservation of Bats in Europe (1994)'. This agreement recognises that endangered migratory species can only be properly protected if activities are carried out over their entire migratory ranges. The EUROBATS Agreement area covers 48 Range States in Europe. The geographical area stretches from Northern Scandinavia to the Mediterranean Sea and from the Atlantic Ocean to the Ural Mountains. The aims of the Bat Agreement are to protect all European populations of 45 bat species - whether migratory or not - occurring in Europe and non-European Range States: through legislation, education, conservation measures and international cooperation with Agreement members and with those who have not yet joined. The Agreement sets up legal protection standards, while developing and promoting transboundary conservation and management strategies, research and public awareness across the Agreement area. It also assists in finding financial support for mainly cross-border oriented projects and has developed a wide-ranging Conservation and Management Plan, which is the key instrument for the Agreement's implementation. It addresses such issues as legal requirements, population survey and monitoring, roosts, foraging habitats, the use of pesticides and the promotion of public and professional awareness.

This is one of the Multilateral Environment Agreements that applies to Gibraltar.

ACCOBAMS

Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area.

The Convention on the Conservation of Migratory Species of Wild Animals (CMS), adopted this agreement as a regional approach for cetacean conservation in the Mediterranean and Black Seas. The agreement entered into force on 1 June 2001, and Gibraltar is obliged conform to the objectives.

ACCOBAMS covers all cetaceans that have a range within the geographical area of the Agreement and that enter it accidentally or occasionally. The area covered includes the Black Sea, Mediterranean Sea and Atlantic coasts of Morocco, Southern Spain and Portugal.

The Agreement aims to reduce threats to all cetaceans in these waters and to promote closer cooperation amongst Parties with a view to conserving all cetacean species present in the area. It also calls on its members to enforce legislation and to prevent the deliberate taking of cetaceans in fisheries by vessels under their flag or within their jurisdiction, and to minimise incidental catches.

Gibraltar has incorporated legislation for the protection and conservation of cetaceans within the Nature Protection Ordinance LN 1991/11, and within the Marine Nature Reserve Regulations 1995 LN 1995/143. Unfortunately the latter legislation has never been enforced and the illegal use of nets could lead to incidental catches of cetaceans.

Land reclamation and industrialisation of the coastal waters around Gibraltar, and the increase in maritime traffic are placing severe pressure on our resident and migratory populations of cetaceans.

*Bern Convention.
Convention on the Conservation of
European Wildlife and Natural Habitats.*

The Bern Convention is a binding international legal instrument in the field of Nature Conservation, which covers the whole of the natural heritage of Europe and extends to some African States.

Adopted and signed in Bern in September 1979 the Convention came into force on 1 June 1982, with the aim of conserving wild flora and fauna and their natural habitats and to promote European cooperation in that field. It includes the European Community, 40 member states of the Council of Europe and Morocco, Senegal, Tunisia and Burkina Faso.

The Convention is a fundamental treaty at European level for biological diversity, and was included within the EC under Council Decision 82/72/EEC of 3rd December 1981. Gibraltar is obliged to apply the objectives in the Convention, in conjunction with the member state, the United Kingdom.

The parties undertake to:

- Promote national policies for the conservation of wild flora, wild fauna and natural habitats;
- Integrate the conservation of wild flora and fauna into national planning, development and environmental policies;
- Promote education and disseminate information on the need to conserve species of wild flora and fauna and their habitats.

The Convention lists protected species in four Appendices: Appendix I: strictly protected flora species, Appendix II: strictly protected fauna species, Appendix III: protected fauna species, and Appendix IV: prohibited means and methods of killing, capture and other forms of exploitation.

Appropriate legislative and administrative measures must also be adopted to conserve the wild fauna species listed in Bern Appendix II. The following are prohibited:

- All forms of deliberate capture and keeping and deliberate killing.
- The deliberate damage to or destruction of breeding or resting sites.
- The deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation.
- The deliberate destruction or taking of eggs from the wild or keeping these eggs
- The possession of and internal trade in these animals, alive or dead, including stuffed animals and any part or derivative thereof.

Any exploitation of wild fauna specified in Bern Appendix III must be regulated, and the Convention provides exceptions from the above provisions:

- For the protection of flora and fauna
- To prevent serious damage to crops, livestock, forests, fisheries, water and other forms of property.
- In the interest of public health and safety, air safety or other overriding public interests.
- For the purposes of scientific research and education, of repopulation, of reintroduction and for the necessary breeding.
- To permit, under strict supervised conditions, the taking, keeping or other judicious exploitation of certain wild animals and plants in small numbers.

Gibraltar undertook the legislative and regulatory measures through the introduction of nature protection and conservation laws. This was done with the voluntary cooperation of GONHS, who incorporated all legislative requirements and exceptions within these laws.

Amongst the laws dealing with nature protection and conservation are the:

- Endangered Species Ordinance 1990 Ord. N°. 1990-54
- Nature Protection Ordinance 1991 Ord. N°. 1991-11
- Nature Conservation Area(Upper Rock) Designation Order 1991 LN 1993/51
- Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations 1993 LN 1993/52

- Marine Nature Reserve Regulations 1995 LN 1995/143
- Control of Trade in Endangered Species Ordinance 1998 Ord. N°. 1991-11
- Keeping of Wild Animals Ordinance 2002 Ord. N°. 2002-25

Gibraltar Government still has to formalise national policies for the main objectives of the Convention, especially for the conservation of wild flora, wild fauna and natural habitats, and the integration of the conservation of wildlife into national planning, development and environmental policies.

Table 7: Other important species of flora and fauna.

Group		Scientific Name	Motivation	
M	R	I	P	
	X	<i>Patella ferruginea</i>		R C
	X	<i>Lithophaga lithophaga</i>		R C
	X	<i>Pinna nobilis</i>		V C
	X	<i>Nudibranchia spp.</i>		C-V B
X		<i>Balaenoptera acutorostrata</i>		V C
X		<i>Balaenoptera physalus</i>		V C
X		<i>Delphinus delphis</i>		C-V C
X		<i>Globicephala macrorhynchus</i>		R C
X		<i>Globicephala malaena</i>		R C
X		<i>Grampus griseus</i>		V C
X		<i>Orcinus orca</i>		V C
X		<i>Physeter catodon</i>		V C
X		<i>Stenella coeruleoalba</i>		C-V C
X		<i>Tursiops truncatus</i>		R C
X		<i>Chelonia mydas</i>		R C
X		<i>Dermochelys coriacea</i>		V C
	X	<i>Silene tomentosa</i>		1 B
	X	<i>Ononis natrix var. ramosissima</i>	251-500	B
	X	<i>Saxifraga globulifera</i>	101-250	B
	X	<i>Thymus wildenowii</i>	101-250	B
	X	<i>Iberis gibraltaria</i>	1001-10000	A
	X	<i>Limonium emarginatum</i>	1001-10000	A
	X	<i>Cerastium gibraltarium</i>	251-500	B
X		<i>Macaca sylvanus</i>	101-250	D
X		<i>Tadarida teniotis</i>		R C
X		<i>Hemidactylus turcicus</i>		V A
X		<i>Coluber hippocrepis</i>		C C
X		<i>Chalcides bedriagai</i>		V C
X		<i>Macrothele calpeiana</i>		R C
X		<i>Cecilioides spp.</i>		R B
X		<i>Zygaena fausta gibraltaria</i>		C B
X		<i>Buprestis (Yamina) sanguinea</i>		R B
X		<i>Laemostenus (Ceuthostenus) mauretanicus ssp. polymephus</i>		R A
X		<i>Alphasida (Betasida) argentolimbata</i>		R A

B= birds

M= mammals

A= amphibians

R= reptiles

F= fish

I= invertebrates

P= plants

C=common

R=rare

V=very rare

A. National Red Data list

B. Endemics

C. International Conventions (incl. Bern, Bonn and Biodiversity)

D. Other reasons

CITES

The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES or the Washington Convention), was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union). The text of the agreement was adopted by 80 countries in Washington DC, USA, in March 1973 and came into force in July 1975. As of September 2003 there were 163 Contracting Parties to the Convention.

CITES is an International agreement that aims to regulate the international trade in species that are endangered or may become endangered by their uncontrolled exploitation. Species covered in the Convention are listed in the three Appendices according to the degree of protection each requires. The European implementation of CITES is applied through Regulation 338/97 EC and Regulation 1808/01 EC, and is more rigorous than that required by the Convention in that they include several non CITES species, and contain provisions to prohibit and restrict the import of species that are considered to be a threat to the European native flora and fauna.

In Gibraltar, all species that are covered by Articles I, II and III of the CITES Convention are controlled by the Gibraltar authorities and monitored by the Gibraltar Scientific Authority. Importation or exportation of species included in the Convention is only permitted with the relevant authority of CITES documentation. Species of native flora and fauna, including migratory species that are listed under CITES are included in Gibraltar legislation under the Endangered Species Ordinance 1990-54 and the Control of Trade in Endangered Species Ordinance 1998 (LN 1998-11).

World Heritage Convention

This convention was adopted in France in 1972, came into force in December 1975 and was known as 'The Convention Concerning the protection of the World Cultural and Natural Heritage'; in short The 'World Heritage Convention'. The United Kingdom ratified the Convention in May 1984.

This Convention is a unique international instrument that seeks to protect both cultural and natural heritage. Entities that can be considered for incorporation into the World Heritage list are:

- Ancient monuments
- Museums
- Biodiversity sites
- Geological heritage sites

It is also important to recognise landscapes that combine these values even though many of the World Heritage Sites fall into the cultural or natural categories, especially so where the physical and biological aspects of landscape have progressed alongside human activity.

As a result of Gibraltar's wealth in cultural heritage a bid for the inclusion of the Territory of Gibraltar for World Heritage Status was submitted with draft management plans to the member state, the United Kingdom that would be included with other bids from other Overseas Territories and those of the UK.

On the 6 March 2006 the Gibraltar Government withdrew this bid on the basis that it would undermine the capability of economic and development growth of the territory. It stated that future bids would be specific to historical heritage e.g. Moorish Castle, City Walls etc.

EC Habitats Directive. The EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna.

The Habitats Directive 92/43/EEC 1992, identifies habitats and species of special interest within the European Community, and legislates for the notification of Special Areas of Conservation (SACs). The Directive (92/43/EEC) requires Member States to designate certain sites as SACs. From these national lists, Member States and the Commission will agree the Sites of Community Importance, which will become designated SACs. The UK forwarded 331 sites to Brussels as Sites of Community Importance or

Candidate Special Areas of Conservation (cSACs). Together with Special Protection Areas classified under the Council Directive on the conservation of wild birds (79/409/EEC), SACs will constitute the European Union's Natura 2000 network.

The Habitats Directive was transposed into Gibraltar law on 25th August 1995 (Nature Protection Ordinance 1991 (Amendment) Regulations 1995) as its obligation as part of the member state. Proposed candidate Special Areas of Conservation (cSACs) were submitted for their designation to the EC in late 2005. Information regarding the status of species of wild flora and fauna was compiled by GONHS and presented to the Gibraltar Government. It is being assembled by the Joint Nature Conservation Committee (JNCC), in the United Kingdom as part of the responsibility of the Member State. The lists of all requirements and factors affecting Gibraltar that was requested by the JNCC, and affect the implementation of the Directive, are given below (Tables 5, 6 and 9 and Figures 1 and 2).

The sites now require full designation into the European Union's Natura 2000 network. The designation of the marine site is being held back by the Kingdom of Spain who disputes the right of Gibraltar to claim territorial waters, despite being a signatory to the Treaty of Rome and the Geneva Convention.

Table 8: Terrestrial & marine mammals reptiles & amphibians listed in Annex II of the Habitats Directive 92/43/EEC.

Name	Population			
	Resident	Migratory		
		Breeding	Winter	Stage
<i>Miniopterus schreibersi</i>	101-250i			
<i>Myotis myotis</i>	11-50i			
<i>Tursiops truncatus</i>		6-10i		
<i>Careta careta</i>				V

i = individuals; p = pairs.

C= Common; R= Rare; V= Very rare.

The Natura 2000 Network

The Natura 2000 Network is a network of protected areas set up under European Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Member States are required to set up procedures that will enable the establishment of a Europe wide network of protected areas that will guarantee the survival of threatened plants, animals and habitats.

Gibraltar has complied with the requirements of Natura 2000 by designating several terrestrial and one marine site as cSACs under the Habitats Directive that will fulfil these needs (Figures 1 & 2).

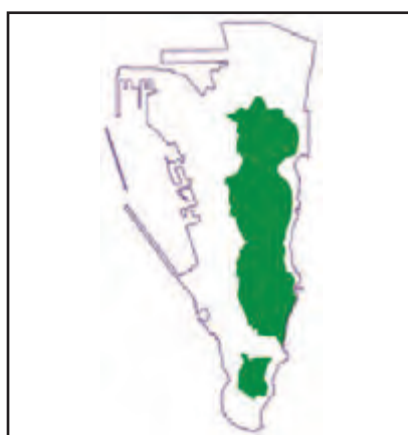


Figure 1: Terrestrial candidate Special Areas of Conservation in green.



Figure 2: Marine candidate Special Area of Conservation in blue within British territorial waters around Gibraltar.

The Rio de Janeiro Convention on Biological Diversity

This is better known as the 'Biodiversity Convention'. It seeks to prevent and reduce the loss of biological diversity at source because of its intrinsic value and its ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic value, and seeks to promote cooperation among States and Intergovernmental Organisations.

The Convention on Biological Diversity was signed by Member States at the United Nations Conference on Environment and Development in Rio de Janeiro. The decision approves the Convention on behalf of the European Community, who concluded the CBD in Council Decision 93/626/EEC on 25 October 1993.

The main provisions required under the Convention are to:

- *Conserve biological diversity.*
- *Ensure the sustainable use of this diversity.*
- *Share the benefits generated by the use of genetic resources.*
- *Ensure access to genetic resources and relevant technologies.*

This is especially significant to Gibraltar where there may be a conflict of interest regarding the designation of the Marine Reserve Special Area of Conservation under the Habitats Directive, where Spain traditionally does not recognise British territorial waters around Gibraltar. Nevertheless each contracting party must, as far as possible, cooperate with other Contracting Parties directly or, where appropriate, through competent international organisations both in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity.

Gibraltar must in accordance with its particular conditions and capabilities:

- *Develop national strategies, plans or programmes for the sustainable use of biological diversity or adapt for this purpose, existing plans or programmes.*
- *Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.*

This is partly achieved through the development of the species, alien species, habitat and site action plans and the programmes recommended within this document. Further research and monitoring will be required to ensure the success of each plan and programme, and to develop further strategies to ensure the conservation and sustainable use of our biodiversity.

Each contracting party should as far as possible:

- *Identify components of biological diversity important for its conservation and sustainable use, having regard to the indicative list of categories set out in Annex I.*
- *Monitor, through sampling and other techniques, the components of biological diversity identified, paying particular attention to those requiring urgent conservation measures and those that offer the greatest potential for sustainable use.*
- *Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity and monitor their effects through sampling and other techniques.*
- *Maintain and organise, by any mechanism, data derived from identification and monitoring activities pursuant to the points set out above.*

These particular provisions have been and are being tackled on a voluntary basis by GONHS experts. Botanical, invertebrate and vertebrate surveys and population studies, monitoring and research programmes, and other activities including the establishment of the Gibraltar Biodiversity Project that are generating interesting scientific data, are addressing some of these provisions. Nevertheless there is a need for the local authorities to recognise and support this work by capacity building, equipping and funding these projects and activities that will ultimately benefit the conservation and sustainable use of biological diversity in Gibraltar.

Each contracting party should adopt economically and socially sound measures that act as incentives

for the conservation and sustainable use of the components of biological diversity by:

- *Establishing and maintaining programmes for scientific and technical education and training for the identification, conservation and sustainable use of biological diversity and its components and providing support for such education and training for the specific needs of developing countries.*
- *Encouraging research which contributes to the conservation and sustainable use of biological diversity, particularly in developing countries.*
- *Promoting the use of scientific advances in biological diversity research in developing methods for conservation and sustainable use of biological resources.*

It is therefore essential that the Gibraltar Government actively supports, with infrastructural and economic initiatives, the GONHS programmes and activities that are addressing the provisions required under the Convention on Biological Diversity.

Public participation should be promoted and enhanced by highlighting the importance of biological diversity through the media and including these topics in educational programmes.

GONHS is currently working on educational material that will promote awareness on our biodiversity in middle schools. Already there has been a positive response from the Education Department who are willing to support and disseminate the literature amongst the schools. The poster produced in November 2005 by GONHS to promote Gibraltar's Biodiversity was also well received and has also been circulated by the education authorities as well.

Several initiatives of the Biodiversity Convention do not strictly apply to Gibraltar. Amongst these are the 'use and sustainable use and benefits of genetic resources' that mainly apply to countries that are agricultural producers of crops and livestock and engage in aquaculture or commercial fisheries, where the benefits of specific disease resistant flora or fauna would be of significant value to developing countries.

The Biodiversity Convention includes other articles that also apply in part or in full to Gibraltar:

Cartagena Protocol on Biosafety.

A Council Decision 2002/628/EC concerns the conclusion of the Cartagena Protocol on Biosafety (Official Journal L 201 31st July 2002). The aim is to ensure that the transfer, handling and use of living organisms resulting from modern biotechnology do not have adverse effects on biological diversity or human health, while specifically focusing on transboundary movements.

Gibraltar must be very careful not to accidentally or unwittingly allow its territory, outside the External Frontiers Convention, to be used as a convenient gateway into Europe or any other country, in any transboundary movements that will breach the provisions of the Cartagena Protocol on Biosafety.

Alien Species.

Article 8 (h) of the Convention on Biological Diversity (CBD) requires the contracting parties, as far as possible and as appropriate, to prevent the introduction of alien species, and to control or eradicate those alien species which threaten ecosystems, habitats or species. The CBD is developing agreed global procedures and guidelines, in collaboration with the Global Invasive Species Programme (GISP) that will cover the effective regulation of the introduction, control and eradication of alien species which are or may cause environmental problems.

In Gibraltar, importation of animal species only requires a health certificate from the Environmental Agency and in the case of CITES listed species, a licence from the Gibraltar Management Authority (currently the Collector of Customs) on the advice of the Scientific Authority. The importation of plant species does not require a phyto-sanitary certificate from the Environmental Agency since Gibraltar has no agriculture. However, plants covered by CITES should be subjected to the same procedures as animals. Nevertheless, there are no legal measures to control the importation and introduction of alien pests and pathogens. In the UK, the Department for Environment, Food and Rural Affairs (Defra), undertook a major review of alien species policy, including a review of legislation and guidance, whose recommendations were published in March 2003. Gibraltar should do likewise and model legislation and guidelines around the UK's alien species policy and apply this to Gibraltar's requirements that must include legal provisions relat-

ing to the control and eradication of alien species and include important introduction vectors e.g. ballast water discharge (see Marine Habitats).

Biodiversity and Tourism.

Tourism is one of the fastest-growing industries as well as a major source of foreign exchange earning and employment for many developing countries. It has the potential to contribute in a positive manner to socioeconomic advancement, but the fast and sometimes uncontrolled growth of tourism can be a major cause of environmental degradation and loss of local identity and traditional cultures. Biological and physical resources are in fact the assets that attract the tourists. However, the stress imposed by tourism activities on fragile ecosystems accelerates and aggravates their depletion. The CBD has developed guidelines for sustainable planning and management of tourism activities in vulnerable ecosystems and habitats of major biodiversity importance.

Gibraltar receives in excess of 7.5 million visitors a year of which a large percentage visit the Upper Rock Nature Reserve. There are no limitations imposed on the number of visitors and vehicles that access the Nature Reserve and numbers are growing annually. This imposes an unsustainable strain on the ecosystem and its flagship species, the Barbary Macaque, which is suffering from undue stress and unacceptable direct interaction with visitors, encouraged by some tour guides and other operators. Other species of plants and animals and their habitats are also experiencing the adverse effects of noise and atmospheric pollution and very little is being done to minimise or mitigate these factors (Perez & Bensusan 2005). Similarly the artificial reef is receiving uncontrolled numbers of scuba divers that may adversely affect the main reason for having the reef there in the first place; that is to increase biodiversity.

Climate Change and Biodiversity.

Collaboration is active between the Conference of Parties of the CBD and the United Nations Framework Convention on Climate Change UNFCCC. Measures for the conservation of forests and other ecosystems can contribute simultaneously to the objectives of both organisations where there is a need to reduce the rate of climate change to allow ecosystems to adjust. The impact on biological diversity that climate changes can have is immense with temperature increases, sea-level rise, changes in precipitation and extreme climatic events amongst the main cause for concern.

There is a need for GONHS to work with Government's Ministry for the Environment on the implications of climate change for nature conservation and the natural environment in Gibraltar. This requires a programme to investigate the likely future impacts of climate change to species and habitats over the next 50 years including its possible effects on the marine environment. It will require policy debate and a legislative framework to accommodate and mitigate impacts on nature conservation.

Needless to say, the impact of climate change on the integrity and the economy of Gibraltar could be catastrophic. It only requires a 2m rise in sea-level to isolate the Rock of Gibraltar from the mainland, and sever our terrestrial and aviation links with the outside world.

Ecosystem Approach.

The ecosystem approach is one of the underpinning philosophies of the Convention on Biological Diversity (CBD) and was adopted at the second Conference of Parties (CoP2) as the primary framework for action. This approach is the strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It is based on the application of appropriate scientific methodologies focused on levels of biological organisation, which encompasses the essential processes, functions and interactions among organisms and their environment.

The ecosystem approach has not been applied entirely to Gibraltar as there has never been the occasion where this initiative could be applied. Nevertheless, the Upper Rock Nature Reserve, together with its management and action plan (Perez & Bensusan, 2005), that addresses the needs of this defined physical area, is perhaps the closest example where an ecosystem approach has in part been applied, encompassing the requirements of the wildlife within that environment.

Global Strategy for Plant Conservation.

A Global Strategy for Plant Conservation was adopted at the sixth meeting of the Conference of Parties. This included 14 outcome-oriented global targets for 2010 that support the broad objectives of:

- understanding and documenting plant diversity.
- conserving plant diversity.
- using plant diversity sustainably.
- promoting education and awareness about plant diversity.
- building capacity for the conservation of plant diversity.

The strategy should operate as a flexible framework within which national and/or regional targets may be developed and a pilot approach for the use of outcome targets under the CBD within the context of the Strategic Plan.

The Gibraltar implementation of the objectives of this strategy is being undertaken, again on a voluntary basis, by GONHS in collaboration with the Gibraltar Botanic Gardens. This initiative is being assisted through the cooperation of the Royal Botanic Gardens, in Kew. The Gibraltar Government should invest in capacity building, equipping and supporting this and other strategies under their obligation to implement the CBD.

Global Taxonomy Initiative

The Global Taxonomy Initiative was established by the Conference of Parties to address the lack of taxonomic information and expertise in many parts of the world, and thereby to improve decision-making in conservation, sustainable use and equitable sharing of the benefits derived from genetic resources. The GTI is intended to support implementation of the work of the Convention on thematic and cross-cutting issues.

The implementation of this strategy is being undertaken by GONHS under their 'Gibraltar Biodiversity Project' that was launched in 2004, with the aim of cataloguing Gibraltar's living resources, producing habitat and species action plans for their protection, re-establishing lost species and recreating lost habitats. Again most of this is being done on a voluntary basis, except the action plans and habitat recommendations within this document, which have been funded by the Overseas Territories Environment Programme.

Impact Assessment, Liability and Redress.

Article 14(1) of the CBD requires the Contracting Parties to ensure that proposed projects which are likely to have significant adverse effects on biodiversity are the subject to Environmental Impact Assessment (EIA) with a view to avoiding and minimising such effects. Article 14(2) requires the Conference of Parties to examine the issue of liability and redress, including restoration and compensation, for cross-border damage to biological diversity.

The Eco-Management and Audit Scheme (EMAS) is a voluntary scheme established under the European Council Regulation 761/01 and aims to recognise and reward organisations that go beyond minimum legal compliance and continuously improve their environmental performance.

Environmental Impact Assessments are covered by EU legislation (the 1985 Environmental Assessment Directive). This was transposed into Gibraltar law under the 'Town Planning (Environmental Impact Assessment) Regulation 2000' (LN 2000/013).

The authority who decides whether a project requires an EIA is the Town Planner who provides a screening opinion to the Minister before planning permission is granted. The Minister then provides a screening direction to the developer within 28 days that should be published in the Gazette. Nevertheless the Minister may direct that a particular proposed development is exempt from the application of these regulations in accordance with Article 2(3) of the Directive, and shall send a copy of any such direction to the Development and Planning Commission (DPC). The Article in the Directive states that this should be done in exceptional cases and in such cases should consider whether another form of assessment would be

appropriate and whether the information collected should be made available to the public. Notwithstanding this, the Minister should make the information relating to the exemption and the reasons for granting it publicly available. The legislation therefore bestows on the Town Planner and the Minister the power to reject, in any but exceptional circumstances, the requirement for an EIA without proper public consultation, consideration or explanation.

Transboundary impacts on biodiversity as a result of reclamation projects by both the Kingdom of Spain and Gibraltar should be the subject of EIAs.

The Gibraltar Government should address the issues of liability and redress in the case of negative impact on the environment, and legislate to provide and include mitigation measures within these regulations.

Indicators.

Biodiversity indicators should be promoted as a method of assessing the effectiveness of measures taken to conserve biodiversity under the CBD. This issue, raised at the second Conference of Parties and undertaken since the fourth Conference, has focused on identifying a core, global set of indicators which incorporate state, pressure and response indicators.

Gibraltar implementation has not been put in practice but should, when conditions are right, include:

- The guidance and framework for indicators being discussed within the CBD.
- The efforts of the European Commission and the European Environmental Agency (EEA) to develop criteria for the identification of indicators at the regional and national level.
- Gibraltar biodiversity strategies and the need for indicators that they identify.
- Reporting requirements (national and international).
- Ongoing monitoring and surveying activities.

GONHS has already developed a number of biodiversity monitoring, surveillance, and recording programmes that include ornithological, botanical and invertebrate studies of the marine and terrestrial ecosystems. These initiatives should continue to be encouraged and supported by the relevant authorities, by capacity building, and financial support.

Protected Areas.

The Convention on Biological Diversity defines a protected area as 'a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.' Article 8(a) of the CBD requires Contracting Parties to establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity. Article 8(c) requires Parties to regulate or manage biological resources (whether within or outside protected areas) with a view to ensuring their conservation and sustainable use, while Article 8(d) aims to promote the protection of ecosystems, natural habitats and species in natural surroundings. Article 8(f) requires the rehabilitation and restoration of degraded ecosystems and the promotion of the recovery of threatened species. A system of protected areas forms a central element of any national strategy to conserve biological diversity, and the central role of protected areas has been repeatedly emphasised in decisions of the CoP.

In Gibraltar the implementation of protected areas is being achieved under the Habitats Directive with the designation of candidate Special Areas of Conservation of the Upper Rock Nature Reserve, the Great Sand Slopes and Talus slopes and the Windmill Hill Flats as the terrestrial areas and the designation of the candidate marine Special Area of Conservation of the territorial waters that encompass the area south of Sandy Bay around to the South end of the South Mole. This fulfils the obligations under the CBD, but allows for other areas to be conserved outside the remit of the Habitats Directive, under the Nature Protection Ordinance.

Public Awareness and Education.

Increasing the level of public awareness of, and support for, biodiversity is seen as essential in both the short and long term for the Convention on Biological Diversity to succeed in achieving its aims. Article 13 of the CBD requires Contracting Parties to:

- Promote and encourage understanding of the importance of biodiversity, the measures required for its conservation, and the inclusion of these topics in educational programmes and
- co-operate with other States and international organisations in developing educational and public awareness programmes with respect to the conservation and sustainable use of biodiversity.

Article 13 was addressed by the fourth Conference of Parties, where it was decided that public education and awareness issues should become an integral component of all sectoral and thematic items under the CBD's works programme.

The raising of public awareness on biodiversity issues in Gibraltar is being tackled by GONHS, largely through the media, through its publications, talks, seminars and through its membership. GONHS has published several articles in the main Gibraltar daily newspaper 'The Gibraltar Chronicle', highlighting the work being done as part of the Gibraltar Biodiversity Project, has held public presentations, talks and seminars based on the work required under the CBD and is currently in contact with the Department of Education to find ways in which information relating to the conservation of biodiversity can be made available to schools.

Sustainable use of Biodiversity.

Sustainable use of the components of biodiversity is one of the three objectives of the CBD, as defined in Article 2 and elaborated in Article 10. The development of practical principles, operational guidance and associated instruments, focusing on different ecosystems within the CBD's thematic work programme, was part of the objectives in three workshops that came about with the adoption of sustainable use of biodiversity as a cross-cutting issue at the fifth Conference of Parties.

The Gibraltar Government must address all the issues encompassed within the Convention on Biological Diversity and compile a biodiversity strategy where they tackle sustainable development. There is a growing realisation that the current model of development is unsustainable. In other words we are living beyond our means and beyond our capability to accommodate development within the natural environment. The Gibraltar Government must realise that there are serious constraints and limitations as to how far Gibraltar can continue to develop and that we are reaching saturation point, that will affect the ability to provide jobs, accommodation, infrastructure and the quality of life that we all yearn for. Our environment and natural resources are being placed under increasing stress that will affect our welfare and livelihoods.

We need to strive for a 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'. This is the widely recognised international concept of sustainable development and unless we start to make real progress toward reconciling these contradictions, we all, wherever we live, face a future that is less certain and less secure than we in Gibraltar have enjoyed over the past fifty years. Prosperity and development do not necessarily mean a better future or a better quality of life. We need to make a decisive move toward more sustainable development both because it is the right thing to do - and because it is in our own long-term best interests. It offers the best hope for securing the future.

2010 Biodiversity Target

The Conference of Parties adopted a strategic plan for the Convention on Biological Diversity. Its mission statement commits the Parties to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth.

This target was subsequently endorsed by the World Summit on Sustainable Development.

The objectives of the meeting on '2010 Global Biodiversity Challenge' held in May 2003 were:

- To review approaches for understanding and measuring biodiversity loss;
- To review the 2010 target in the context of other biodiversity-related targets
- To identify key initiatives in addressing biodiversity loss (such as MEAs) and how they relate to the 2010 target; and
- To review and agree on the most appropriate approaches for reporting on progress.



Gibraltar Neanderthals





3. Key Species & Habitats

3. Key Species & Habitats

The conservation of species and habitats in Gibraltar requires an intimate knowledge of the wildlife of the Rock and its interrelationship with its environment, together with an appreciation of its needs and an understanding of potential and existing threats.

Large countries have benefited from having numerous scientists with ample resources and a wealth of knowledge, with large biological datasets. This has facilitated the preparation of biodiversity action plans, as most of the groundwork required was available in national databases. This is not the case in small countries or territories, such as Gibraltar, where much of the groundwork in some taxonomic groups is still incomplete and requires further research. Nevertheless a great deal of work has been accomplished in the last thirty years – largely by GONHS through the efforts of its volunteers – and this has resulted in a thorough knowledge of much of the flora and fauna and their habitats. Despite this the development of action plans has required further monitoring and surveying of both species and habitats in order to assess the condition of habitats, the distribution and welfare of species and the potential and existing threats that affect both.

Our knowledge of the wildlife in Gibraltar in historic times is limited, although we are indebted to a number of amateur naturalists, whose publications provide a diversity of useful references. We know of the immense loss and transformation of the natural vegetation of the Rock, the growth of the population and of urban areas and of the expansion of the port and harbour. However, we lack intimate knowledge of some of the wildlife present before this transformation and are not aware of all of the species which may have become extinct locally.

Wildlife conservation is most often carried out through the management and protection of habitats. However, some species require their own action plans due to their particular habitat requirements, because their distribution is restricted globally or locally, or because they are threatened with local extinction.

Two types of conservation action plans have been adopted here. These are the Habitat or Site Action Plans and the Species Action Plan. All sites considered important in biodiversity terms have been included. The criteria used in selecting the species for independent action plans are as follows:

- Endemic or near-endemic species, subspecies or varieties
- Species with a restricted global distribution
- Species with a restricted regional and/or local distribution
- Species included in the EU Birds or Habitats Directive; the Bern, Bonn, or CITES Conventions or protected by the Nature Protection Ordinance (L/N 13 1991)
- Species that are not endangered internationally and are not rare in nearby Spain, but which are rare and threatened in Gibraltar

Each species has been classified under one of four categories of conservation concern (Table 1). Priority species of conservation concern are listed in appendix 1, together with their categories and the sites and habitats in which they are found.

Table 1: Categories of Conservation Concern assigned to species included in the Action Plans.

Category	Definition
Global	The presence of the species in Gibraltar is important to its international conservation, due to a) Gibraltar forming all or a large part of its distribution or harbouring all or much of its population, or b) the species having an overall unfavourable conservation status worldwide
European	The presence of this species in Gibraltar is important to its conservation in Europe because a) populations of the species in Gibraltar form an important component of the overall European population, or b) the species has an unfavourable conservation status throughout the whole of Europe
Regional	The species is not threatened at an International level but is rare or absent in neighbouring Andalucía
Local	The species is not uncommon in neighbouring Spain but has an unfavourable conservation status in Gibraltar

Figs 1 and 2 give the proportions of priority vascular plant and vertebrate species within each of our four categories. A similar figure has not been prepared for invertebrates as only a small number of species have been considered and the presence of all of these in Gibraltar is deemed to be of global importance.

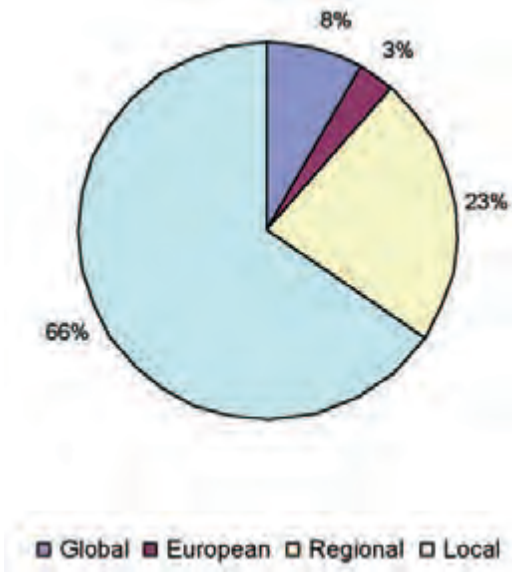


Figure 1: Relative importance of vascular plant species included in the action plans.

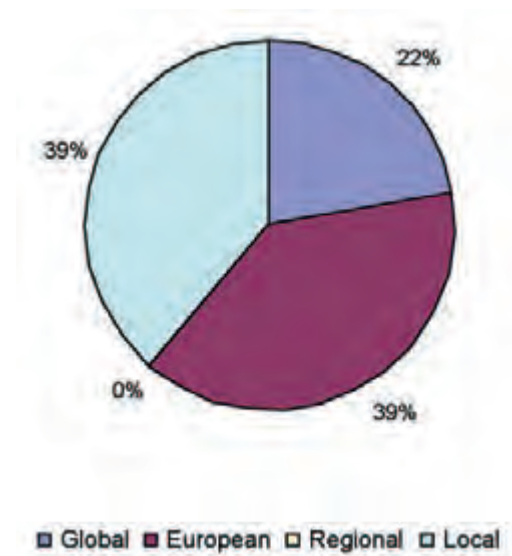


Figure 2: Relative importance of vertebrate species included in the action plans

In preparing Action Plans for sites and habitats, it is important to consider the number of priority species that each of these holds, as well as the category of importance that these species are given. Figs. 3 and 4 show the number of priority vascular plant and vertebrate species of each category found at each site.

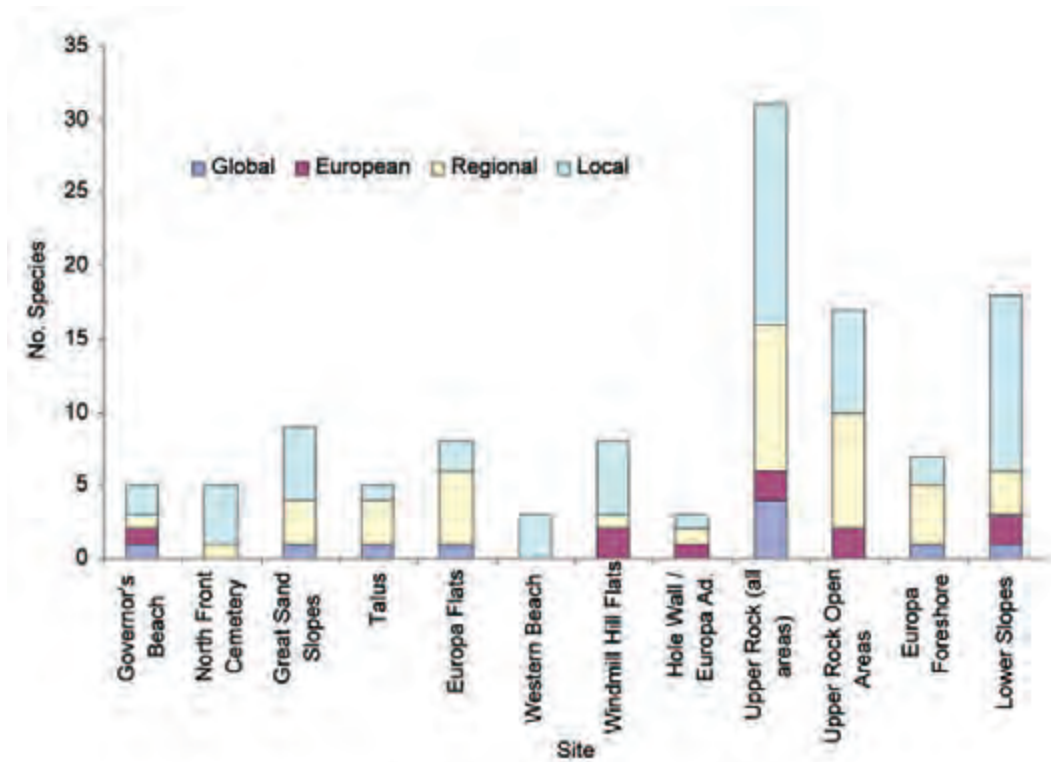


Figure 3: Number and relative importance of priority vascular plant species per site.

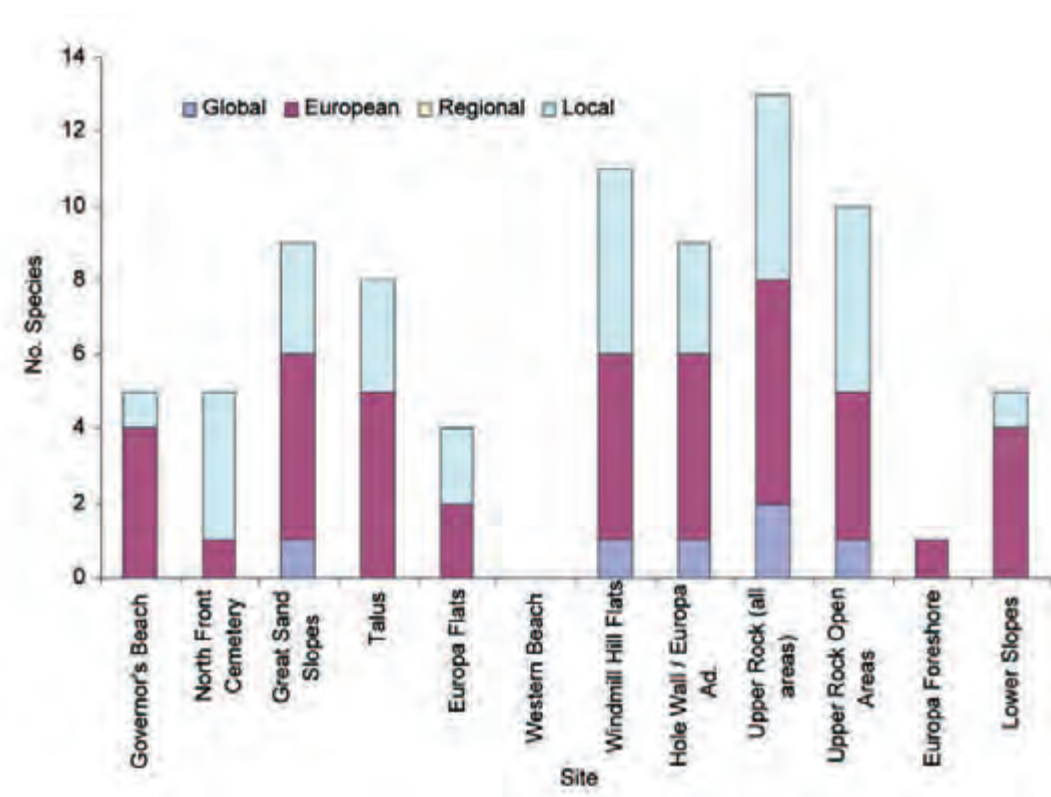


Figure 4: The number and relative importance of priority vertebrate species per site.

It can be seen from Figs. 3 and 4 that sites differ in their importance to priority species. The Upper Rock holds the largest number of priority plant and vertebrate species. It also holds the largest number of species that are of global and European importance. The importance of the open areas of the Upper Rock – which cover a relatively small area of the Nature Reserve – to the Upper Rock's overall biodiversity is clear.

Sites that hold relatively few species should not necessarily be considered less important in the conservation of biodiversity. Sites that hold relatively few priority species may hold species that no other sites hold, and this may reflect the difference in habitat between these sites and others. This highlights the fact that, as well as the number of priority species at each site, the identity of these species also needs to be considered in site conservation planning. Fig. 6 shows, for each site, the number of species only found at one of them.

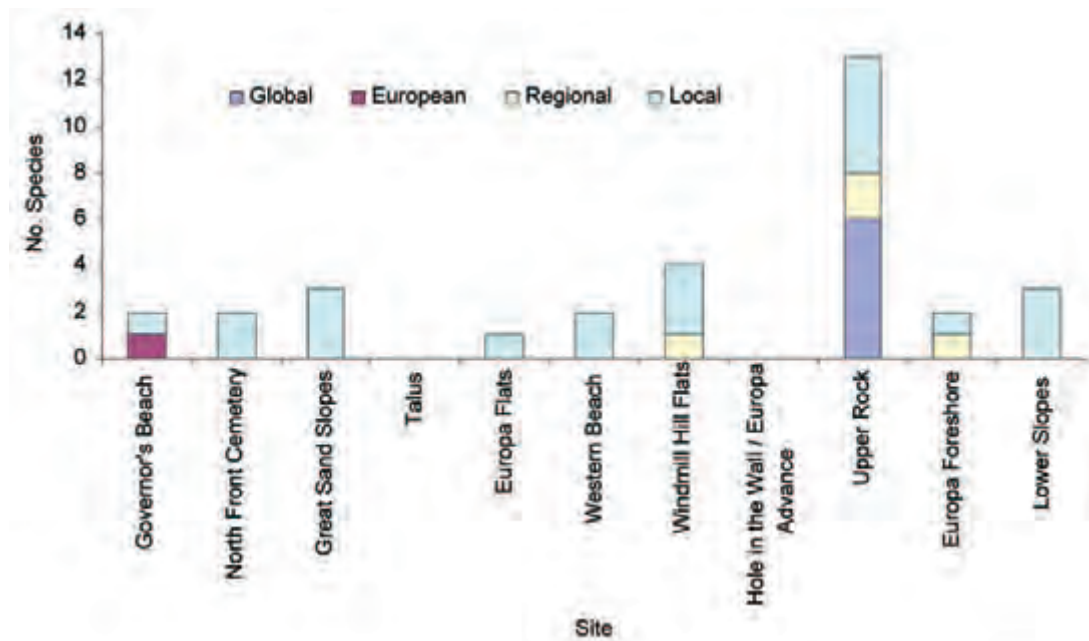


Figure 5: Number of priority species found at one site alone, for each site.

The importance of each site to biodiversity partly reflects their area. This may be due to a variety of factors. Firstly, the Species-Area effect determines that larger areas hold more species, partly because larger areas can hold larger, more stable populations (Begon *et al.* 1996). Also, a larger site is more likely to hold a higher diversity of habitats.

A more precise appraisal of the relative importance of sites to priority species can be gathered by examining the importance of habitat types to our endangered or vulnerable fauna and flora. Many sites consist of more than one habitat. It is likely that many of the sites that hold a large number of priority species also hold several habitats, and that the diversity of priority species found at these sites in part reflects habitat diversity. However, it is clear that some habitats are more important than others for priority species. The relative importance of different habitats to priority species is shown in figs. 6 and 7. In addition, fig. 8 shows, per habitat the number of species found in only one habitat.

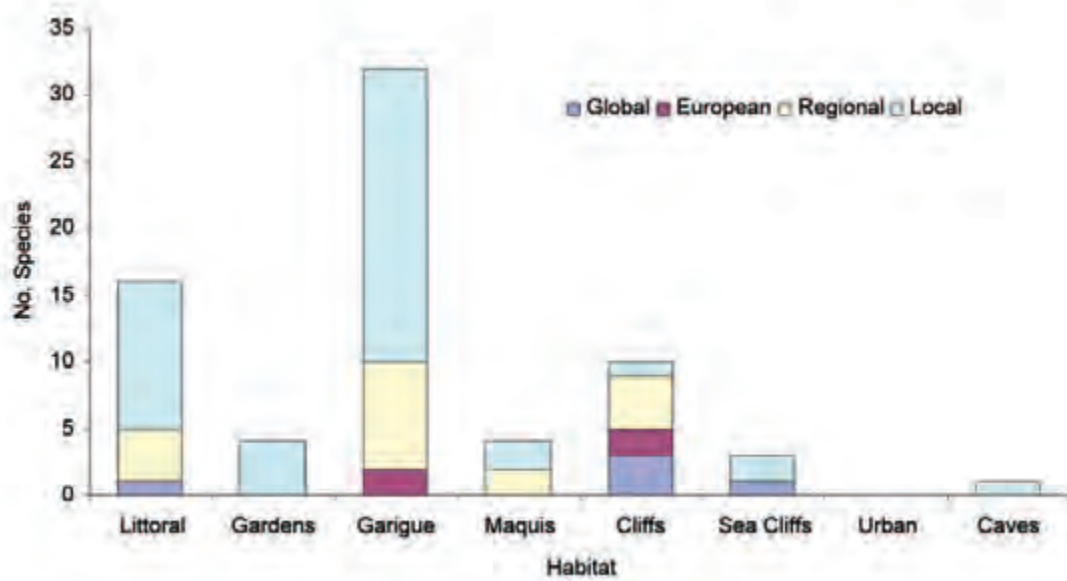


Figure 6: Number of priority vascular plant species under each threat category in each habitat.

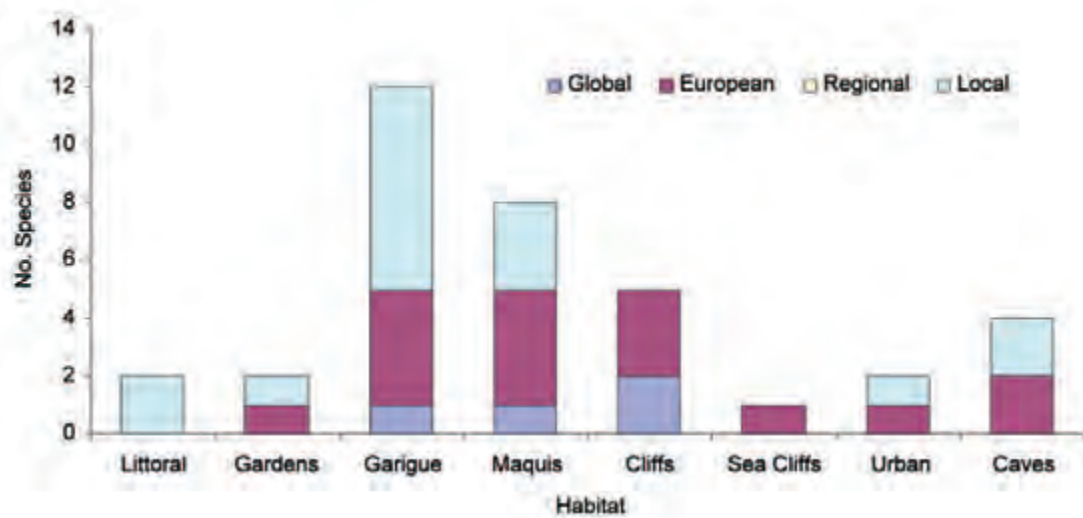


Figure 7: Number of important vertebrate species under each threat category in each habitat.

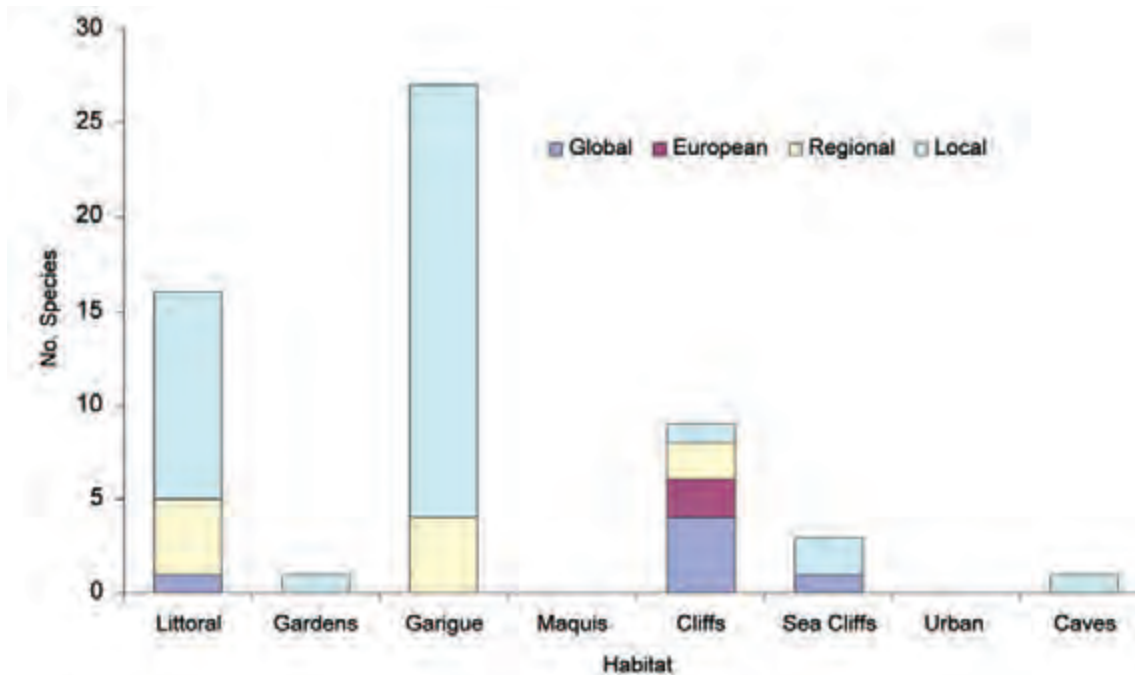


Figure 8: Number of priority species found in one habitat alone, for each habitat.

It is evident from figs. 6, 7 and 8 that cliffs constitute the most important habitat in Gibraltar for species with an unfavourable international conservation status. This is true for both vascular plants and vertebrates. This is not surprising. Gibraltar holds an extensive network of cliffs and steep, rocky slopes, making the Rock ideal for species that favour cliff habitats. Many of the internationally threatened or vulnerable vertebrates found in Gibraltar rely on cliffs as breeding sites. The Peregrine *Falco peregrinus*, the Eagle Owl *Bubo bubo* and the European Free-tailed Bat *Tadarida teniotis* are examples. The importance of cliffs to plant species derives from two main factors in addition to their extent. The Rock is composed of Jurassic limestone, unlike the Spanish countryside to the north. This means that limestone-loving plant species will favour Gibraltar but not nearby Spain. The second factor is that Gibraltar lies close to North Africa, and is composed of a similar limestone to that found in the closest parts of Morocco. This means that some North African species are found only in Gibraltar, and nowhere else in Europe. These North African species, as well as the species and other taxa that are restricted to the Rock, are all cliff specialists. These examples illustrate the importance of conserving cliff habitats in Gibraltar. These habitats are currently under threat in Gibraltar. Chapter 4 discusses their importance more fully, as well as the factors threatening these and steps that should be taken to conserve them.

Figures 6 and 7 suggest that, although the Upper Rock harbours more priority species than other sites, it is actually the habitats that cover a proportionally small area that are most important for these species. The maquis, which covers the majority of the Upper Rock's surface area, is actually fairly poor in priority plant species, and not as rich in priority vertebrate species as some other habitats. The maquis is also fairly poor in invertebrate species richness and density (*pers. obs.*).

The importance of cliff habitats, a large proportion of which are found within the Nature Reserve, has already been discussed. Garigue habitats, which cover only a small proportion of the Upper Rock's surface area, and which are decreasing in size and threatened by the encroaching maquis, hold the highest number of both priority vascular plant and vertebrate species. In addition, this habitat type is extremely rich in invertebrates and supports important populations of the endemic beetle *Buprestis sanguinea calpetana* (*pers. obs.*). The importance of garigue habitats when compared to the dense maquis, as well as their threatened status, would suggest that habitat management is necessary both to maintain current areas of garigue and to clear some areas of maquis to make way for garigue. Although large areas of the maquis should be conserved, due largely to the unique composition of this habitat on the Rock, some areas should be cleared partially and enriched with tree species that were found on the Rock before its Mediterranean woodland was cleared, as recommended by Perez & Bensusan (2005). These actions would enhance the Nature Reserve's biodiversity considerably.

Chapter 4 consists of Action Plans for sites and habitats. Action Plans for priority species comprise chapter 5. Action Plans have only been prepared for species that are of serious conservation concern, and for which adequate knowledge of the species' biology, distribution and existing threats is available (table 2).

Table 2: Species for which Action Plans have been prepared.

Birds	
<i>Falco naumanni</i>	Lesser Kestrel
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Alectoris barbara</i>	Barbary Partridge
<i>Bubo bubo</i>	Eagle Owl
<i>Phalacrocorax aristotelis desmarestii</i>	Western Mediterranean Shag
Mammals	
All Cetaceans	Whales & Dolphins
<i>Macaca sylvanus</i>	Barbary Macaque
<i>Vulpes vulpes silacea</i>	Red Fox
<i>Oryctolagus cuniculus</i>	Rabbit
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle
<i>Miniopterus schreibersii</i>	Schreiber's Bat
Vascular Plants	
All Orchids	
<i>Cerastium gibraltarium</i>	Gibraltar Chickweed
<i>Silene tomentosa</i>	Gibraltar Campion
<i>Thymus wildenowii</i>	Gibraltar Thyme
<i>Ononis natrix ramosissima</i> var. <i>ramosissima</i>	Gibraltar Restharrow
<i>Limonium emarginatum</i>	Gibraltar Sea-lavender
<i>Iberis gibraltaria</i>	Gibraltar Candytuft
<i>Saxifraga globulifera</i> var. <i>gibraltaria</i>	Gibraltar Saxifrage
<i>Laurus nobilis</i>	Bay Tree
<i>Fraxinus angustifolia</i>	Narrow-leaved Ash
Insects	
<i>Buprestis sanguinea calpetana</i>	A buprestid Beetle
Arachnids	
<i>Macrothele calpeiana</i>	Gibraltar Funnel-web Spider
Terrestrial Molluscs	
<i>Acicula norrisi</i>	A Snail
<i>Osteophora calpeiana</i>	A Snail

The Species Action Plans contain a short description of their biology and global distributions. They include more detailed accounts of local distribution and particularly emphasise the threats and action required with a specific summary of the species' protection status and local population trends.





4. Habitats

Gibraltar Neanderthals

4. Habitats

Habitats are a key element in the diversity, density and distribution of biological species. The variability and physical condition of these habitats constitute an important factor in the conservation of many of our native species and therefore habitats form an integral part of the Biodiversity Action Plan. The conservation of habitats will, in most cases, ensure the welfare of the species found within each. However, the particular requirement of some species and their restricted distribution means that there is a need for specific habitat management processes to ensure the survival and conservation of those particular species. Consequently the habitat action plans call for the incorporation of the needs of the key species of wildlife found within habitats to ensure that there is no loss in biodiversity and that all wildlife is conserved.

With a terrestrial area of 5.8 km² and a marine area of territorial waters extending three nautical miles from the shore, except at a mid-point in the Bay of Gibraltar, Gibraltar's habitats are inevitably restricted. Yet even taking account of its size, the biological diversity of the area is large, and includes some endemic and near-endemic subspecies or varieties. Moreover, the importance as a migratory route for avian, airborne invertebrate and marine species make Gibraltar and the area of the Strait an important site for the conservation of ecosystems and habitats.

The habitats that make up the territory of Gibraltar can be found within the two main ecosystems. These are the terrestrial and the marine ecosystems, which are sub-divided into some of the representative habitat types found in the Mediterranean region. Some of these areas are delineated by topographical characteristics; others are formed by natural and/or artificial boundaries as in the case of the Upper Rock Nature Reserve, whereas some are bordered by the nature of their underlying geology or the sea bed.

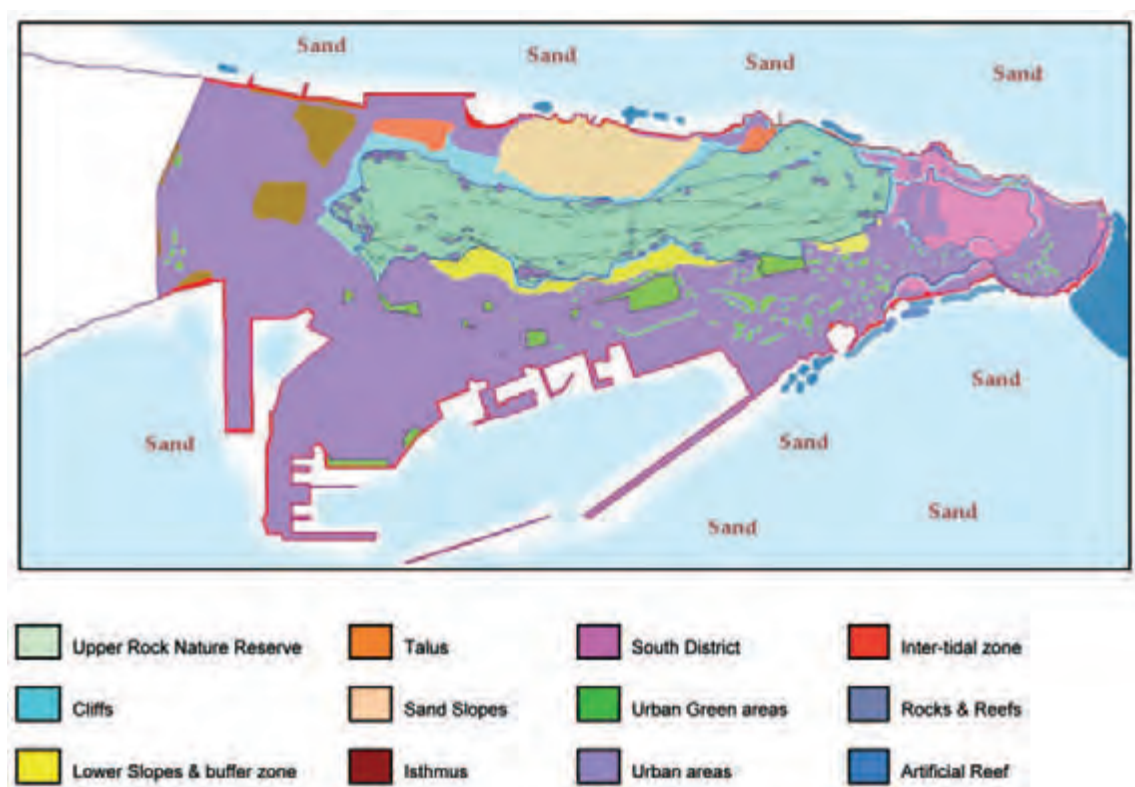


Figure 1: Main Terrestrial habitat zones, some incorporating one or more Mediterranean habitat types.

Terrestrial Habitats

1. UPPER ROCK NATURE RESERVE

The Upper Rock is bordered by the cliffs of the North Face and the summit ridge, and is bounded to the south and west mainly by cliffs and the 'unclimbable fence' which runs approximately along the 200m contour. The entire Upper Rock was in MoD hands until the 1970's, when most of the area was handed over to the Gibraltar Government, with the MoD retaining some smaller areas. The Upper Rock was marketed as a tourist site by the then Gibraltar Tourist Office.

1.1. Current Status

Overall responsibility for the Upper Rock Nature Reserve comes under the Government of Gibraltar, with responsibility shared by the Gibraltar Tourist Board and the Ministry for the Environment.

Within the Reserve three small residential areas can be found: Poca Roca, Bruce's Farm area and Devil's Gap Battery area, housing a total of approximately 20 families. There is also a Drug Rehabilitation centre, a nature research facility run for GONHS by the Gibraltar Trust for Natural History and the GONHS field centre at Jews Gate. Gibraltar is riddled with caves, of which a total of 30 can be found within the Reserve, some containing archaeological deposits and others important for bats.

1.2. Habitats

The vegetation on the Upper Rock Nature Reserve has changed considerably in recent centuries (Cortes 1979, Perez & Bensusan 2005). The succession of this vegetation can be seen in old prints, paintings and photographs of Gibraltar. In these, one can see how the growth has progressed from the lower reaches of the Upper Rock where the soil is deeper, to the upper, steeper and more exposed areas, where soil is limited to crevices and recesses in the limestone.

The vegetation on the Upper Rock has developed in the last 200 years and forms the largest expanse of natural vegetation in Gibraltar. A vegetation survey was carried out by Cortes (1979), who recorded five different vegetation-types on the Upper Rock: High Maquis, Low Maquis, Maquio-garigue, Garigue, and Pseudosteppe and Steppe. As part of the 'Upper Rock Nature Reserve Management Plan', an extensive survey of the vegetation was carried out in 2002 to include future recommendations of habitat management (Perez & Bensusan, 2005). The resulting 57 sample areas were then classified into vegetation types according to those used by Cortes (1979). The complete vegetation map for the Upper Rock Nature Reserve is reproduced here.

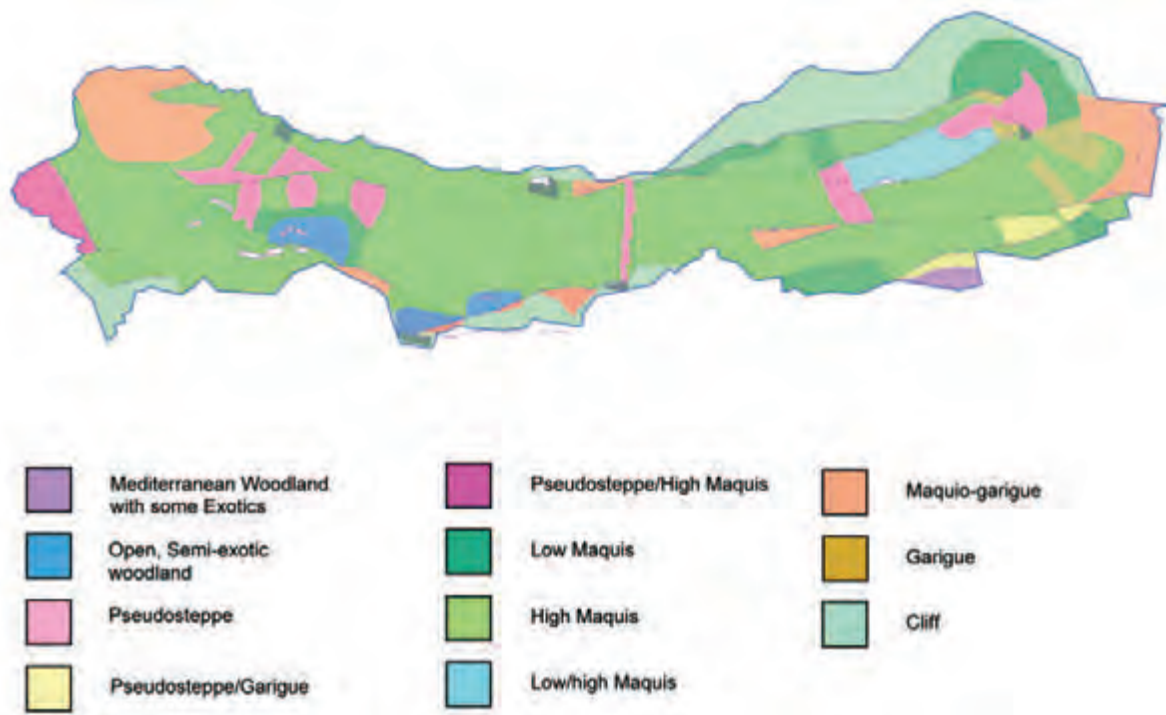


Figure 2: Mediterranean habitat types within the Upper Rock Nature Reserve (from Perez & Bensusan 2005).

The current composition of the vegetation of the Nature Reserve is composed of several habitat types of community interest that fall under Annex I of the Habitats Directive and require the designation of Special Areas of Conservation (SACs). Amongst these are:

- **Mediterranean Sclerophyllous Forests** dominated by the Olive *Olea europea* and Olive scrub, which reaches 12m in the high maquis. The Carob Tree *Ceratonia siliqua* is slowly re-establishing itself in the lower reaches of the Reserve and these two species form the main component of this habitat.
- **Vegetated sea-cliffs of the Mediterranean coast** especially those with endemic *Limonium spp.* These can be found around the Mediterranean Steps with the limestone sea cliffs harbouring perennial plant communities including Gibraltar Sea-lavender *Limonium emarginatum*, endemic to the Strait of Gibraltar.
- **Thermo-Mediterranean and Pre-steppe Brush** is found on parts of the western slopes of the Rock and especially Rock Gun. This habitat is extremely important for the breeding Barbary Partridge *Alectoris barbara*, as a stop-over site for migratory birds and for foraging Barbary macaques.
- **Mediterranean Arborescent Matorral** includes matorral with Sweet Laurel *Laurus nobilis*. This is representative of Mediterranean matorral covering most of the western slopes of the Nature Reserve, dominated by Wild Olive *Olea europea*, *Osyris quadripartita*, Mediterranean Buckthorn *Rhamnus alaternus*, and Lentisc *Pistacia lentiscus*, with individual Sweet Laurel *Laurus nobilis*, and Nettle Tree *Celtis australis*, scattered within. The laurel-containing matorral is mainly found on the south-western slopes. The presence of this species makes it a Priority Habitat. This habitat is important as a stopover site for migratory birds and holds populations of the Gibraltar Funnel-web Spider *Macrothele calpeiana* and the Horseshoe Whip-snake *Coluber hippocrepis*.
- **Chasmophytic Vegetation on Rocky Slopes** of calcareous sub-types can be found on the northern and eastern cliffs of the Rock, including the outcrops of the cliffs along the western side. Plants of particular interest found within this habitat type include Gibraltar Saxifrage *Saxifraga globulifera gibraltaria*, Gibraltar Chickweed *Cerastium gibraltarium*, Gibraltar Thyme *Thymus wildenowii*, Wall Helichrysum *Helichrysum rupestre*, and Gibraltar Candytuft *Iberis gibraltaria*. The endemic Gibraltar Champion *Silene tomentosa*, which was thought to be extinct (Cortes & Linares, 1993) has also been found in this habitat.
- **Other Rocky Habitats** there are caves that are not opened to the public. These are largely unspoilt caves, some possibly containing roosting or breeding bats, all of which are protected.

1.3 Current Factors affecting Habitat

Most factors affecting the habitats of the Nature Reserve have been addressed in Perez & Bensusan (2005) and a short summary is given here.

- Lack of habitat management.
- Touristic development pressures and speculative projects such as the Funicular railway.
- Spread of exotic species.
- Excessive traffic and pollution.
- Uncontrolled visitor numbers leading to litter and fire risk and undue disturbance.
- Lack of maintenance of former MoD firebreaks.
- Encroachment of trees and shrubs in Pseudosteppe habitat, leading to a simplification of vegetation.

1.4 Current Action

1.4.1 LEGAL STATUS

The Government designated the area of the Upper Rock as a Nature Reserve in 1993 under the 'Nature Conservation Area (Upper Rock) Designation Order, 1993' (L/N 51 of 1993).

Conservation and protection measures are afforded to all species of birds found within the Reserve under the Nature Protection Ordinance (L/N 13 1991), and in particular those listed in the EC Birds Directive under Annex I of Council Directive 79/409/EEC, and can be seen in chapter 2. The conservation of natural habitats and of wild fauna and flora is covered in the EC Habitats Directive (Council Directive 92/43/EEC). Other species of primary importance, including some that were left out of the Council Directive, are included in the Nature Protection Ordinance (LN/11 of 1991).

As part of the requirement of the Habitats Directive to nominate Sites of Community Importance (SCIs) under the Natura 2000 Network, the Government of Gibraltar has now designated the Upper Rock Nature Reserve as one of the candidate Special Areas of Conservation (cSACs) and has submitted the proposal to Brussels.

1.4.2 MANAGEMENT, RESEARCH AND GUIDANCE

The Government of Gibraltar commissioned GONHS to prepare a feasibility study and management plan for the Upper Rock Nature Reserve in late 2002. Funding was obtained via the European Union under the European Regional Development Fund Objective 2 programme, and the report, 'Upper Rock Nature Reserve. A Management and Action Plan' (Perez & Bensusan, 2005) was submitted to the Government. That report analyses the Nature Reserve from environmental, historical, natural and touristic perspectives and addresses objectively the problems and concerns poised by the different stakeholders. It provides a management plan using a programmatic approach and presents goals and objectives together with a list of recommendations after each chapter including a costed action plan.

Perez & Bensusan (2005) proposed a number of tasks for environmental management and maintenance, employing a recommended 10/12 men work team, of which the following are directly relevant to biodiversity conservation:

- Annual clearing of roadside vegetation.
- Clearing of vegetation along paths.
- Removal of invasive species of plants.
- Control of *Acanthus mollis*.
- Removal of woody vegetation around the Rock Gun area.
- Removal of woody shrubs in Garigue habitat.
- Planting programme in woodland sites using Mediterranean species.
- Habitat management around tourist sites.
- Dead pine trees to be replaced.
- Clearing of all refuse within caves.
- Clearing of firebreaks.
- Habitat/site restoration within habitat types of Community interest that fall under the Habitats Directive.

It is encouraging to see that Martin's Path, between Jews' Gate and St. Michael's cave, was cleared of encroaching vegetation in the autumn of 2004 and opened up to the public, although much work remained. In December of 2005 a works team was finally allocated to the Nature Reserve by the Ministry for the Environment and under guidance from GONHS, completed the clearing of Martin's Path, including the removal of the obstructing dead trees. They are currently working on clearing other pathways. This team could be deployed to carry out other habitat management tasks.

1.5 Conservation Direction

The Upper Rock Nature Reserve is an important area for biodiversity, containing most of the habitat types found in Gibraltar and a large percentage of the species that have independent species action plans. The implementation of the goals and objectives presented in Perez & Bensusan (2005) would cover all the necessary requirements of the Nature Reserve at present. The works team recommended in the Management and Action Plan would be the fundamental core unit that would tackle the habitat management and other relevant works within the Nature Reserve. The first stage would involve major clearing and reparation. Once the initial phase has been addressed then works would concentrate on annual maintenance and remedial works.

A wardening system would be crucial to the Management Plan of the Upper Rock. The wardens would monitor the Nature Reserve and guarantee its viability, partly through supervising and controlling the various programmes carried out by the works team.

2. CLIFFS



Figure 3: The east side cliffs above Catalan Bay (L. Linares).

The Rock of Gibraltar largely consists of limestone cliffs. The boundary of the Nature Reserve is bordered by the majestic North Face cliff to the north, which rises from sea-level to a height of 412m, and the east side cliffs that rise above the talus and sand slopes to the east. To the west a line of cliffs of approximately 70m in height rise up from the Lower Slopes and the Nature Reserve buffer zone from just south of Bruce's Farm all the way to Rooke Battery, where they become steep slopes. Cliffs also surround the raised beach of Windmill Hill and sea cliffs extend all the way from Sandy Bay to the South Mole. The heavily fractured zone of North Gorge is also bordered by the cliffs of Windmill Hill to one side and the Buena Vista cliffs to the other. The fault system also runs north and falls sharply to the west as a stretch of vertical limestone cliffs running below the Buena Vista, levelling off and again falling towards Rosia.

The cliffs on the Rock of Gibraltar can be divided into two categories. Sea-cliffs run from Sandy Bay to the South Mole. The others are inland cliffs, surrounding the Nature Reserve and including those found around the North Gorge and the Buena Vista area.

A number of caves can be found in many of the cliffs of Gibraltar. Some are located at the base of the cliffs and have been weathered by the action of the sea. Others are found along existing fissures and fault lines with their entrances high up on the vertical faces. The constant temperature and relative humidity of some of these caves means that they provide a habitat for a number of species. Two species of bats, Schreiber's Bat *Miniopterus schreibersii* and Mouse-eared Bat *Myotis myotis*, were once common in many of these caves and may still use them as roosting, and breeding sites. The Free-tailed bat *Tadarida teniotis* frequents cracks and fissures along the cliff face. Several plant species can be found growing in the humid walls of cave entrances. A fly species (Diptera), yet to be identified, aestivates on the cave walls in huge numbers during the hot late summer and early autumn period.

There is relatively little distance from the shoreline anywhere on the Rock and therefore all the cliffs found in Gibraltar bear the influence of the sea, be it from the strong south-westerly winds or the humid and salt-laden levanter which often causes a cloud rising over the Rock. However, it is the sea-cliffs that bear the brunt of adverse weather conditions. A number of plant species, resistant to these conditions grow on these cliffs. One of these, the Gibraltar Sea lavender *Limonium emarginatum*, is restricted to the Strait area.

The inland cliffs are a vitally important habitat for many of Gibraltar's special plants, most of which are cliff-loving species. North-facing and shaded areas in particular provide a refuge for many of Gibraltar's endemic and near endemic species. Among the species to be found here is the endemic Gibraltar Campion *Silene tomentosa*. Other important and scarce species also grow in the clefts and fissures of the cliffs and rocky outcrops of the Nature Reserve. These are the Gibraltar Saxifrage *Saxifraga globulifera*, Gibraltar Thyme *Thymus wildenowii*, Gibraltar Candytuft *Iberis gibraltaria* and Gibraltar Chickweed *Cerastium gibraltarium*.

Several bird species are characteristic of cliff habitats and some use the cliffs as nesting sites. The North Face of the Rock holds the last remaining Lesser Kestrels *Falco naumanni* in Gibraltar. This species is afforded the category of a bird of 'global conservation concern' by Birdlife International (Tucker & Heath 1994, Heath & Evans 2000) and is listed under Annex 1 of the EC Birds Directive 79/409/EEC. Irby (1895) recorded vast

numbers breeding there, but by 1980 only 15 pairs were recorded (Cortes *et al.* 1980). More recently, numbers have been down to four pairs in some years, although more pairs breed in most years.

Other important birds of cliff habitats are the Peregrine *Falco peregrinus*, with the very high density of 7 breeding pairs in Gibraltar, the Little Owl *Athene noctua*, a pair of Ravens *Corvus corax*, Eagle Owl *Bubo bubo*, Alpine Swift *Apus melba* with breeding pairs on the North Face and the Governor's Beach cliffs, Mediterranean Shag *Phalacrocorax aristotelis desmarestii* and Blue Rock Thrush *Monticola solitarius*. The Lesser Kestrel, Peregrine, Eagle Owl and the Mediterranean Shag are listed under Annex 1 of the EC Birds Directive and included in the Species Action Plans.

2.1 CURRENT STATUS

At present only some of the cliffs that form the boundary of the Upper Rock Nature Reserve are within the limits of the Reserve. Most of the west, north and east cliffs fall outside the designated zone although the boundary in these areas is not clearly defined. Perez & Bensusan (2005) recommend that the cliffs surrounding the Nature Reserve be included within the boundary as all cliff habitat falls under one of two EC Habitats Directive priority categories that require the designation of Special Areas of Conservation. In addition they recommend that all cliff habitats in Gibraltar be protected as part of a Natura 2000 site under the EC Habitats Directive (92/43/EEC).

The two relevant habitat types are 'Vegetated sea cliffs of the Mediterranean coasts (with endemic *Limonium spp*)', and 'Chasmophytic Vegetation on Rocky Slopes'. These two habitat types were assessed by Cortes (1994), and this assessment is reproduced below.

Vegetated sea cliffs of the Mediterranean coasts (with endemic *Limonium spp*)

Location:

Sea cliffs from Sandy Bay to Europa Point and Rosia Bay. This includes the sea cliffs, which rise up to Martin's Cave around Mediterranean Step's where Gibraltar Sea Lavender *Limonium emarginatum* can also be found growing.

- a) Degree of representativity of the natural habitat type on the site.
Representative of Mediterranean limestone sea cliff with perennial plant community including *Aeonium haworthii* and *Aeonium arboreum*, and *Limonium emarginatum*, endemic to the Strait of Gibraltar.
- b) Area of site covered by habitat in relation to the habitat in Gibraltar.
50%.
- c) Degree of conservation.
Poor to very good. Areas have accumulated rubbish and rubble, and others have been polluted by effluent from the refuse incinerator and the refuse holding area. The area within the Nature Reserve is unspoiled due to its inaccessibility and remoteness.
- d) Global assessment.
The occurrence of an endemic makes this an area of global importance. It is also unique in landscape value together with the rest of the Mediterranean Steps.

Chasmophytic Vegetation on Rocky Slopes (Calcareous sub-types)

Location:

Northern and eastern cliffs of the Rock of Gibraltar, and the outcrops of the cliffs on the western side of the Rock.

- a) Degree of representation of the natural habitat type on the site.
Extensive areas of mostly unspoilt chasmophytic vegetation representative of the habitat. Plant species of particular interest include Gibraltar Saxifrage *Saxifraga globulifera gibraltaria*, Gibraltar Chickweed *Cerastium gibraltarium*, Gibraltar Thyme *Thymus wildenowii*, Wall Helichrysum *Helichrysum rupestre*, and Gibraltar Candytuft *Iberis gibraltaria*. The endemic species Gibraltar Champion *Silene tomentosa*, until recently presumed extinct (Cortés & Linares 1993) has been rediscovered in this habitat where the known world population is of two plants.
- b) Area of site covered by habitat in relation to the habitat in Gibraltar.
50%
- c) Degree of conservation.
Very good. Some sites more accessible and close to human habitation require monitoring.
- d) Global assessment.
The chasmophytic vegetation of the Rock of Gibraltar is representative of areas of limestone in the Mediterranean, but has added global importance in the occurrence within it of taxa which are either endemic or with affinities to North Africa.

The unique flora found on cliff habitat is protected under the Nature Protection Ordinance 1991 (L/N 11 of 1991). Gibraltar's more special plant species are listed under Schedule 3 of the ordinance. They are the following:-

Table 2. Important Gibraltar flora listed under Schedule 3 of the Nature Protection Ordinance 1991.

Common Name	Scientific Name
Gibraltar Chickweed	<i>Cerastium gibraltarium</i>
Gibraltar Champion	<i>Silene tomentosa</i>
Gibraltar Candytuft	<i>Iberis gibraltaria</i>
Gibraltar Saxifrage	<i>Saxifraga globulifera</i>
Gibraltar Restharrow	<i>Ononis natrix</i>
Gibraltar Sea Lavender	<i>Limonium emarginatum</i>
Gibraltar Thyme	<i>Thymus wildenowii</i>
Parsley	<i>Petroselinum crispum</i>
Giant Tangier Fennel	<i>Ferula tingitana</i>
Succowia	<i>Succowia balearica</i>

Of these, only the Gibraltar Restharrow *Ononis natrix* and the Giant Tangier Fennel *Ferula tingitana* are not cliff specialists.

The endemic Gibraltar Champion and near endemic species of plants were not included in the Habitats Directive because the member state, the United Kingdom, did not consult the Gibraltar authorities. Nonetheless Gibraltar submitted these special plants under 'Other important species of fauna and flora' to be incorporated within the Habitats Directive with a request for their inclusion within those species requiring special protection measures under Annex II.

Details of the populations of Peregrines, Lesser Kestrels, Eagle Owls and Shags are given in their respective action plans. A pair of Ravens established themselves on the Rock in 2001 after a period of 30 years. Breeding has been attempted unsuccessfully on an annual basis, but one of the birds is missing a foot and this may explain their lack of success.

The large numbers of Alpine Swifts *Apus melba*, as seen in the days of John White in the 18th century, no longer occur. Nevertheless some pairs of this large swift still breed, although in very small numbers. Numbers are apparently stable, although due to the small breeding population, the species could become extinct from Gibraltar at any time. A cliff dwelling species in Gibraltar, it can be found nesting in the recesses of the roof of the entrance to Gorham's cave at Governor's Beach and in a few crevices on the North Face of the Rock.

The Little Owl *Athene noctua* breeds in small numbers along the cliffs below Windmill Hill, the east side cliffs and the North Face of the Rock, with at least one pair in the Camp Bay/Little Bay area and another below the Apes' Den. The removal of the water catchments and subsequent re-establishment of the sand slope habitat should prove an opportunity for an increase in the number of pairs on the east side of the Rock.

The Blue Rock Thrush *Monticola solitarius* can be found in much the same areas. This bird will breed on sea cliffs as well as the cliffs inland, and also close to urban areas. The species is resident, although some migrants are observed in late October and again in March.

Other bird species frequenting cliffs include the Yellow-legged Gull *Larus michahellis*, Wren *Troglodytes troglodytes*, Crag Martin *Ptyonoprogne rupestris* in the winter, and occasionally Rock Bunting *Emberiza cia*.

Many caves were once roosting and breeding sites for large colonies of Schreiber's Bat *Miniopterus schreibersii* and Mouse-eared Bat *Myotis myotis* in the middle of the last century (*pers. obs.* & Palao *Unpubl.*), and are still potential sites for these mammals. In recent years the former species has only been recorded in one tunnel. The European Free-tailed Bat *Tadarida teniotis* is a cliff dwelling species, using small clefts and fissures in the rock face as roosting and breeding sites. It is certainly present in good numbers all over Gibraltar, as evidenced from its audible calls.

All bats are afforded protection under Schedule 3 of the Nature Protection Ordinance 1991 (L/N 11 of 1991). Schreiber's, Mouse-eared, Pipistrelle and European Free-tailed Bats are also covered in Annex I of the EUROBATS agreement. Schreiber's and Mouse-eared Bats are listed in Annex II of the Habitats Directive, and the European Free-tailed bat is included in other important species of flora and fauna within the same Directive.

2.2 CURRENT FACTORS AFFECTING HABITAT

As the human population of Gibraltar continues to increase, the Government of Gibraltar is under pressure to provide accommodation. The land reclamation policy of the late 1980's and 1990's has already used up most of the potential shallow water areas within and outside the Gibraltar Harbour, creating large residential and commercial zones, although several development and reclamation projects are still in the pipeline. On the east side of the Rock, a further reclamation project will provide for additional development. This may substantially increase the human population leading to mounting pressure to provide additional services infrastructure, and further development. Already there are few marine areas left that would be economically viable for reclamation and those that are available are increasingly deep. Therefore developers have been looking on land for potential open spaces.

Two projects, Maida Vale and North Gorge, have received planning permission from the Development and Planning Commission, even though much of the development is situated just a few metres from a cliff and in a geologically unstable fractured and fault zone. The justification for the location seems unreasonable but due to the high prices the properties fetch and the enormous profit margin for developers the environment pays the ultimate price. The works include cliff stabilisation, involving removal of vegetation, scraping, grouting of crevices and fissures with concrete and anchoring of boulders, followed in places by the installation of wire mesh. This practice is meant to reduce personal liability rather being a health and safety exercise, for eventually the cliff stabilisation works will rust and wear away and the properties will be left at risk. The logical strategy should be: *'if a site is dangerous then do not build on it'*.

Following a large collapse of a disused tunnel in the Camp Bay area, the Government contracted the services of Sharrock Shand Ltd who sub-contracted the works to Golder & Associates Ltd based on the geo-technical advice by Mott MacDonald, to carry out an assessment of the Camp Bay and Little Bay cliffs. In their opinion, the areas in question required extensive cliff stabilisation. This resulted in large areas of the cliff at Little Bay, holding important native plants, being grouted and concreted over. It also affected several other species of flora and included an area where Blue Rock Thrushes and Little Owls nested. The resulting eyesore was clearly inspired by an overenthusiastic application of stabilisation methods. Much of the natural appearance of the cliff area in this location has been lost together with several plant populations above Little Bay (Perez & Bensusan, 2005).

Mitigating factors included a survey carried out by the GONHS climbing section to assess the flora and fauna of a large part of the cliffs that were to be concreted over. This report recommended areas where mesh should be favoured over concrete in order to safeguard plant species, areas where scraping could be damaging to the plant communities, and in the areas where potential nesting sites for birds had been lost, the erection of nest boxes for Little Owl, Kestrel, Pallid Swift and Blue Rock Thrush.

Following this, cliff stabilisation works have been carried out on the Windmill Hill south cliffs where again a residential area has been built in close proximity to the cliffs, and the cliffs above the old Governor's Cottage where a crematorium is to be built. Further residential development in the North Gorge has also required extensive cliff stabilisation with rock bolting, scraping and grouting and the erection of wire mesh. Another development at the Naval Hospital area has also required, according to the advice of the contractors, cliff stabilisation even though there has always been a roadway below a cliff that carries close to three quarters of a million tourists a year to the Upper Rock Nature Reserve. A new residential development at Maida Vale will apparently involve the stabilisation of the cliffs below Rooke Battery. These cliffs form the boundary of the Nature Reserve and hold an interesting plant community, as well as nesting birds. There is a concern that the same entity assessing cliffs later carries out the proposed works, leading to questions of propriety. An independent assessment of these recommendations should be made on each occasion.

In addition, it is important that initial assessments include direct involvement from GONHS, so that proposals prepared already take account of ecological requirements.

The Rock of Gibraltar is surrounded by cliffs, and the authorities should ensure that any developments, be they residential or commercial, are not in close proximity to the cliff base and an appropriate buffer zone should ensure the safety of these developments. This has happened in several areas, including Catalan Bay. Nevertheless there are extensive areas of Gibraltar, especially on the east side of the Rock, where

roadways and residential or commercial properties are already sited close to the cliffs, and where the possibility of rock falls, due to the steep nature of the slopes underlying the cliffs, is always great. Historically, Catalan Bay has been affected by severe rock falls, as has Both Worlds at Sandy Bay. Here the erection of safety nets on the sand slopes by MoD before the handover of this site to the Gibraltar Government has ensured a degree of protection. Rock falls have also taken place elsewhere such as Devil's Tower road at the crossroads with Eastern beach and at the entrance to the tunnel past the oil tanks at Sandy bay, where unfortunately there was a fatality. In this case the Gibraltar Government decided to close off the roadway, but rock falls are likely to occur anywhere along this and other roads and developed areas, where these are near cliffs. Perez & Bensusan (2005) argue that cliff stabilisation is certainly not the answer. Already some areas that were stabilised in the Camp Bay and Little Bay areas are showing signs of fracturing and erosion and the concrete covering is giving way and allowing rock falls, as well as falling itself. We have to realise that there is an element of risk if buildings and roads are situated close to cliffs. A buffer zone to act as a catchment area for falling rocks is the best answer. This will solve the environmental problem of cliff habitat degradation and allow for safe residential developments without the added very high cost of cliff stabilisation.

2.3 CURRENT ACTION

A specific management plan for cliffs is needed to establish the criteria and requirements for cliff stabilisation in relation to risk management and urban development.

3. LOWER SLOPES AND BUFFER ZONE

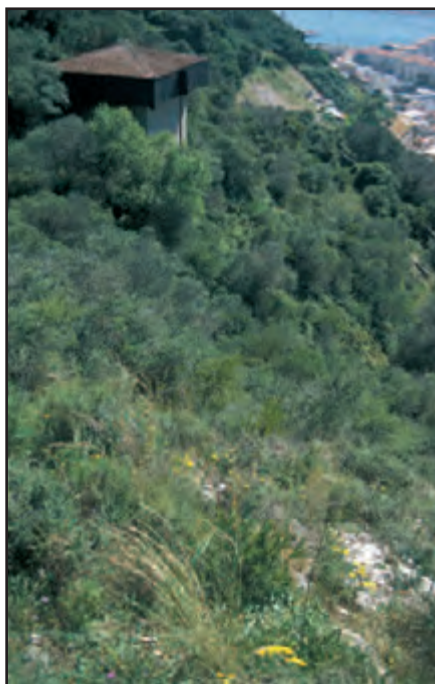


Figure 4: Part of the Lower Slopes site with maquis-garigue habitat (L. Linares)

The Lower Slopes of the Upper Rock are situated to the west of the Nature Reserve at an average elevation of 130m, and form the Buffer Zone between the urban areas of the upper town and the Upper Rock Nature Reserve. The Lower Slopes are bordered to the east mainly by cliffs along the Nature Reserve's boundary and slope steeply in places over 100m down to the upper town boundary. The geological composition of these slopes differs from much of the rest of Gibraltar in that the underlying rock is composed of shale and mudstones with a few occasional outcrops of limestone (Rose & Rosenbaum 1991). This area runs south of the Waterworks in the Calpe area to the area below Devil's Gap, but, for the purposes of this study, the buffer zone also extends from here to Maida Vale above Europa Road. Further outcrops of this rock and soil type runs above Mount Road south below Jews' Gate ending in an area around Lathbury Barracks. Water penetration in this rock type is minimal and prominent features of the main area of the Lower Slopes are two eroded gullies running east to west, one of which is known as Arengo's Palace Gully.

3.1 Current Status

3.1.1 LEGAL STATUS

The Lower Slopes and Buffer Zone lie outside the Upper Rock Nature Reserve and therefore do not fall under the protection of the 'Nature Conservation Area (Upper Rock) Designation Order 1991' (L/N 51 of 1993) and the 'Nature Conservation Area (Upper Rock Nature Reserve) (Protection and Regulation) Regulations' (L/N 52 of 1993). Nevertheless the flora and fauna found within this habitat zone enjoy the protection of the 'Nature Protection Ordinance 1991' (L/N 11 1991).

3.1.2 MANAGEMENT, RESEARCH & GUIDANCE

When the Upper Rock was a military area and out of bounds in the early and mid 1900's, the Lower Slopes, between Calpe and Devil's Gap and below Jews' Gate, were cleared of all tall vegetation as a fire-break and for security purposes annually, and goats were grazed there. These processes kept the vegetation open, as can be seen in the photograph of the period (See Fig.5). Shortly after the transfer of the Upper Rock to the Gibraltar Government in the early 1970's, the Lower Slopes were no longer maintained and the regeneration and succession of the vegetation slowly took place. This vegetation has slowly grown in size and height with the dominant shrubs of Spiny Broom *Calicotome villosa* and Olive *Olea europea* interspersed with low growing plants and the occasional Nettle Tree *Celtis australis*. The buffer zone behind the Rock Hotel is composed of high maquis – the same habitat type as most of the Upper Rock – as this area did not receive the habitat management imposed by the MoD.



Figure 5: Gibraltar in the early 1900s. Note the absence of vegetation on the Lower Slopes. (R. Wheeler)

Access is difficult since there is no roadway that passes close to or intersects the Lower Slopes. This isolation has proved a blessing for wildlife. The Buffer Zone area between the Rock Hotel and the cliff is the property of the Hotel owners and has remained undisturbed far longer than the Lower Slopes. The vegetation here was allowed to grow, with olive trees reaching up to six metres. A road runs down from Devil's Gap and joins Europa Road beside the Casino now south of the Hotel. This roadway is derelict, and only used by the Fire Brigade for emergency purposes.

Several plant species, particularly orchids, are found here and nowhere else, possibly due to composition of the soil and underlying rock (Linares 1988, 1990, 1994). Approximately half of Gibraltar's plant species can be found growing on the Lower Slopes area, of which 27 are protected under part II, Section 11 of the Nature Protection Ordinance 1991 (L/N 11 of 1991), in that they are not specified under Schedule 2 of the Ordinance. Tables 3 and 4 list some of the rare plants of the Lower Slopes.

Table 3: Special plants found exclusively on the Lower Slopes.

Common Name	Scientific name
Shepherd's Needle	<i>Scandex pecten-veneris</i>
Yellow Bartsia	<i>Parentucellia viscosa</i>
Cut-leaved Lavender	<i>Lavandula multifida</i>
Pale Flax	<i>Linum bienne</i>
Narrow-leaved Red Vetchling	<i>Lathyrus setifolius</i>
Bean Trefoil	<i>Anagyris foetida</i>
Clubmoss	<i>Selaginella denticullata</i>
Gibraltar Saxifrage	<i>Cerastium gibraltarium</i>

From Perez & Bensusan 2005

Table 4: Orchids found on the Lower Slopes.

Common Name	Scientific name
Yellow-bee Orchid	<i>Ophrys lutea subsp. lutea</i>
Brown-bee Orchid	<i>Ophrys fusca subsp. fusca</i>
Mirror Orchid	<i>Ophrys speculum subsp. speculum</i>
Bumble-bee Orchid	<i>Ophrys bombiliflora</i>
Small-flowered Serapias	<i>Serapias parviflora</i>
Autumn Lady's Tresses Orchid	<i>Spiranthes spiralis</i>
Two-leaved Gennaria	<i>Gennaria diphylla</i>

From Perez & Bensusan 2005

The Lower Slopes are also used extensively by breeding Barbary Partridges *Alectoris barbara*, Blackcaps *Sylvia atricapilla* and Sardinian Warblers *Sylvia melanocephala*, and the surrounding cliffs hold several pairs of Blue Rock Thrushes *Monticola solitarius*. This area is also used as a feeding are by bats including Schreiber's Bat *Miniopterus schreibersii*, which require open ground.

3.2 Current Factors affecting Habitat

Several negative factors affecting the habitat of the Lower Slopes must be remedied if the area is to remain an important site for orchids and other rare plants. All these factors are interlinked and should be tackled together for there to be any chance of success in conserving the habitat.

- Lack of habitat management.
- Increase in density of vegetation.
- Risk of fire.
- Excessive grazing and erosion caused by feral goats in some areas.
- Dumping of rubbish.

3.3 Current Action

None.

3.4 Threats

The area is under threat from construction developments, with several projects having been proposed. Of these the most significant was the proposal for a road connecting the Calpe area to the Green Lane roadway. This was allegedly to alleviate traffic in the upper town and avoid congestion with tourist traffic descending from the Nature Reserve. This project, which was to be carried out by 'Kumigai Gumi', a Japanese firm, would have included the development of the land on either side of the road, thereby completely destroying the whole of the Lower Slopes area. Thankfully the project was shelved in the 1980s, although there has been occasional interest in resurrecting it since then. The use of the Great North Road, a tunnel running from the Calpe area near the Moorish Castle and exiting at Maida Vale on Engineer Road, would achieve the same traffic diversion without the development and destruction of the lower slopes, but also without the related lucrative benefits for real estate developers.

Another proposed project involves the development of the Lower Slopes above the Rock Hotel and above Maida Vale for the construction of houses. These speculative construction enterprises would have the following serious consequences on the Upper Rock Nature Reserve.

- Proximity to the 'Apes Den' would bring undesired interaction with humans.
- The development of the Lower Slopes would bring the wildlife of the Nature Reserve into closer contact with the human population.
- Risk of rock falls would then require unsightly and ecologically damaging cliff stabilisation, grouting, netting and cementing over.
- Construction of the area will turn the Gibraltar Botanic Gardens into a green island, with little chance of crossover of wildlife to and from the Nature Reserve.
- Increased risk of fire.
- Increased atmospheric pollution from traffic.
- Increased light and noise pollution.

3.5 Conservation Direction

Necessary measures include:

- A campaign to highlight the importance of the Lower Slopes and Buffer Zone, not only for the special plant species, but also as a boundary and green corridor separating the urban town zone from the Nature Reserve.
- A habitat management programme to reduce the density of encroaching maquis vegetation with the purpose of creating the open areas that existed in the past. This will also reduce the fire risk to the Upper Rock Nature Reserve.
- Removal of invasive plant species.
- Removal of remaining poultry and feral pigeon enclosures.

4. TALUS



Figure 6: The Northern Talus slope (L. Linares)

A talus is 'a sloping mass of rock debris at the base of a cliff'. The talus slope is on the east side of the Rock at the base of the vertical cliff that towers up to Rock Gun. It extends from the eastern end of Devil's Tower Road to Catalan Bay, where the talus slope was quarried for limestone rocks. The formation of the slope is due to the constant deposition of rocky material from the cliffs above. The main deposition took place during the glaciations, with the action of rain water freezing and expanding within fissures and crevices in the rock, fracturing the rocks and breaking them off to fall to the base of the cliff, forming a conglomerate which fused to form breccias. Wind-blown sands off the Mediterranean Basin, then covered the talus with a thick mantle, with more rocks later falling from above, to produce the combination of rock and sand where a unique habitat of plants and animals now exists.

Another talus exists at the base of the cliff that rises up to the Rock's summit at Spyglass. It is situated south of Sandy Bay and is contained to the south by a set of north facing cliffs. This slope was quarried at the same as the other talus slope, and a lot more aggregate was removed, providing an extensive area where the Admiralty Oil Tanks were situated. Above this the remnant of this talus slope is small and inaccessible, but contains a less sandy base and more soil cover that has allowed shrubby plants to grow. In the area between the two talus slopes lie the Great Sand Slopes (5).

4.1 Current Status

4.1.1 LEGAL STATUS

The talus slopes are not currently covered by any environmental legislation or European Directives, but the general provisions of the Nature Protection Ordinance apply.

4.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

This account applies to the northern talus slope below Rock Gun, since the southern talus slope has remained inaccessible, except to the GONHS caves and cliffs section, which has covered the area in search of caves. The slope has not been the object of biological research except in visual surveys.

The talus slopes appears to buttress the majestic vertical sea-cliffs that extend from sea level to over

400m high. Their location on the eastern side of Gibraltar means that they face the morning sun and the humid easterly winds that prevail during much of the year. The slope is relatively steep, at an angle of over 50°, at which angle the sand remains stable. The composition of this slope can be seen from the quarried section that has exposed the talus layer. It mainly consists of rock conglomerate with a thin overlying layer of sands. Sandy soil is restricted in Gibraltar to the isthmus, an original wind-blown dune beach-sand system, and the ancient windswept sands of the eastern slopes of Gibraltar. (There is also a bed of very fine red sands found under the southern town area, where it can be seen at the Alameda Botanic Gardens, but this sand is very different to that on the eastern side.)

The Talus slope has deteriorated in the recent past due mainly to the construction of access roads to Catalan Bay, rendering the base unstable, so that sand and soil slippage has occurred regularly until the slope has again achieved a stable angle. The most noteworthy of these landslides covered the roadway, and access to Catalan Bay was diverted through William's Way tunnel until the existing road was rebuilt. Evidence of the original depth of sand and soil of the slope can be seen at the base of the cliff, where weak sandstone remnants, reminiscent of the fossil dunes of the sand slopes, can be seen in places up to 8m above the base of the cliff. This demonstrates how susceptible this talus slope is to any degradation at the base of its slope.

The Talus is an open, unfenced area and access is not restricted to members of the public. Excessive walking on the Talus, and for that matter the Sand Slopes, is extremely destructive since the nature and consistency of the soil and sandy layers is weak and any pressure applied underfoot loosens the soil, exposing the plants' roots. It is therefore advisable to restrict any access to these slopes unless absolutely essential.

A key influence on the uniqueness, and hence importance, of the flora and fauna of the Talus slopes and the Great Sand Slopes has obviously been the nature of underlying soil. Man has not influenced the vegetation of the area in recent years; although in the past goat herds from Catalan Bay were allowed to roam freely on these slopes. The lack of records prevents detailed comparison of the present plant community with the original one. At present the habitat of the talus is a sandy garigue, composed mainly of grasses and low growing shrubs. Of these, one of the most conspicuous plants, forming small clumps is the Large Yellow Restharrow *Ononis natrix*, of which the subspecies *ramosissima*, variety *ramosissima* known as the Gibraltar Restharrow, grows in abundance here. This variety is exclusive to the Rock of Gibraltar and is therefore the flagship taxon of this habitat. Table 4 lists some of the special plants that can be found in this habitat.

Table 5: Key plant species found on the Talus slope.

Common Name	Scientific Name
Gibraltar Restharrow	<i>Ononis natrix</i> var. <i>ramosissima</i>
Montpellier Broom	<i>Teline monspessulana</i>
Parsley	<i>Petroselinum crispum</i>
Giant or Large -flowered Mullein	<i>Verbascum giganteum</i>
Silver Sea Stock	<i>Malcolmia littorea</i>
Erect Dorycnium	<i>Dorycnium rectum</i>
Gibraltar Candytuft	<i>Iberis gibraltarica</i>

Amongst the larger plants and shrubs found on the Talus are some Olive bushes *Olea europea*, Osyris *Osyris quadripartita*, Lentisc *Pistacia lentiscus*, Tamarisk *Tamarix gallica*, Joint-Pine *Ephedra fragilis* and the Shrub Tobacco *Nicotiana glauca*, this last a naturalised alien. Other alien species have become established on the talus, through the action of man: both the Tree Aloe *Aloe arborescens* and the Hottentot fig *Carpobrotus edulis* x *acinaciformis*, plants that do not set seed, have been planted at the base of the slope and form large stands that border the roadway. The Hottentot Fig is an invasive species that was originally used in stabilising sandy habitats and slopes. Although useful in preventing wind-blown erosion, it fails to anchor the sand and soil sufficiently well due to its weak root structure and the blanket nature of its growth, excluding all other plants, and is particularly damaging to the native flora and fauna.

The fauna of this habitat is also very varied and has several unique species that are found exclusively or have their stronghold here.

Several species regularly use the Talus habitat as their feeding or breeding grounds. Amongst the most prolific is the Yellow-legged Gull *Larus michahellis*. This slope holds some sixty pairs that breed on the

ground, many rearing between two and three young. The recently-established Eagle Owls have been using this habitat to prey on the gulls. Further evidence of this was discovered during a visit to the Talus at the end of July 2005, when remnants of adults and gull chicks consisting of wings, heads and feathers could be seen everywhere along the slope. This natural control of the gull population should be encouraged. Strict protection of the Eagle Owl, covered under the Nature Protection Ordinance and the Birds Directive, and its foraging habitat must be assured.

The Kestrel *Falco tinnunculus* has several pairs breeding on the eastern side of the Rock. The birds are regularly seen foraging on the Talus and Great Sand Slopes, feeding on varied prey items from large insects to lizards and small birds. The Barbary Partridge, *Alectoris barbara*, Gibraltar's flagship bird species, can also be found commonly on the talus slope. A small population of this bird has become established here. Their preference for open ground habitats, which is quickly disappearing on the Upper Rock Nature Reserve due to the succession of the vegetation and the lack of maintenance of open ground areas and firebreaks, has encouraged some pairs to establish themselves on the Talus slope. This species is listed under Annex 1 of the Birds Directive and Schedule 3 of the Nature Protection Ordinance.

Table 6: Key bird species using the Talus habitat.

Common Name	Scientific name
Kestrel	<i>Falco tinnunculus</i>
Yellow-legged Gull	<i>Larus michahellis</i>
Barbary Partridge	<i>Alectoris barbara</i>
Little Owl	<i>Athene noctua</i>
Eagle Owl	<i>Bubo bubo</i>
Blue Rock Thrush	<i>Monticola solitarius</i>
Black Redstart	<i>Phoenicurus ochruros</i>
Rock Bunting	<i>Emberiza cia</i>

The habitat of the Talus slope is also ideal for various reptile species. Both the Horseshoe Whip Snake *Coluber hippocrepis* and the False Smooth Snake *Macroprotodon cucullatus* have been seen there. The Iberian Wall Lizard *Podarcis hispanica* is mainly found on the rocky parts of the Talus and the cliff base and the Algerian Sand Racer *Psammotromus algerius*, occurs mainly on or near shrubs. The Moorish Gecko *Tarentola mauritanica* prefers rocky habitat and is therefore at home at the base of the cliff, in crevices and fissures. However, the key species of this habitat are the skinks. These are lizards with greatly reduced or vestigial legs that move by serpentine, 'S' shaped movements on the sand. Two species are found in Gibraltar: the Three-toed Skink *Chalcides striatus* and Bedriaga's Skink *Chalcides bedriagai*. Once frequently found on the isthmus, this sandy habitat has now been reduced to the North Front Cemetery and the Aerial Farm, and both species were last seen at the former site in the 1980s after which over-zealous clearing of vegetation has probably resulted in the disappearance of both species. The Aerial Farm may still hold an isolated population but the stronghold of both species is now the Talus Slopes and the Great Sand Slopes.

The Talus slopes hold a rich community of sand-loving invertebrates, including Lepidoptera (butterflies & moths), Coleoptera (beetles), Orthoptera (crickets and grasshoppers) and Neuroptera (antlions and lacewings). At least five species of ant-lion have been seen regularly in this habitat. *Nemoptera bipennis*, recognised by its yellow lace-like forewings and ribbon-like hind wings is common in late May and June. Grasshoppers can be seen in abundance in late spring with several species awaiting identification. Grasshoppers feed mainly on grasses and are therefore important in this habitat. Coleoptera include the darkling beetles (family Tenebrionidae), which are well represented. Many of these beetles also frequented the isthmus but in the same way as the Skinks, they are now mainly concentrated on the east side slopes. One beetle species, *Buprestis (Yamina) sanguinea* (family Buprestidae) can be found on the Joint Pine *Ephedra fragilis*, a shrub that grows well on the Talus slope. This species is rare globally, found only in small areas of north and central Spain and North Africa, with an isolated population at Gibraltar that forms the endemic subspecies *calpetana*. It is therefore a key species of this habitat, as is *Nemoptera bipennis*. Among the lepidopteran fauna of this habitat are grass-loving moth species, including several species of the family Noctuidae and *Cymbalophora pudica* of the Tiger Moth family, *Arctiidae*.

4.2 Current Factors affecting Habitat

There is very little affecting the current situation of the Talus slopes, but this could change in the near future due to the proposed Eastside Development nearby. However, the occasional use of the site for motor cycle scrambling causes great disturbance, destruction of vegetation, and erosion.

4.3 Current Action

None required at present.

4.4 Threats

The proposed Eastside Development project and land reclamation constitute the greatest threat to the integrity of the northern Talus slope. This proposal involves extensive development on land that will be reclaimed from the sea, but will also include development of the area adjacent to the base of the talus slope. The potential risk of rockfalls in this area will then require safety measures to be implemented. If this is done wisely the environmental impact on the slopes will be greatly reduced. The location of residential development too close to the cliffs and base of the slope is unacceptable, as this would place residents in grave danger and require the implementation of an unreasonable amount of safety measures that would gravely mar the natural appearance of the slope and cliffs and would still not guarantee total protection. If located at a reasonable distance, this would allow for a rock catchment area that would contain falling rocks, with appropriate netting and walls in place. We have to bear in mind that at present the area has no protection whatsoever from rock falls, and this roadway bears a large amount of traffic, in particular in summer. The low incidence of accidents demonstrates the low risk involved and the high stability of the cliffs of the eastern side.

The development of this area as a high density residential area could bring with it other problems that might affect the Talus slope. Amongst these are:-

- Risk of fire.
- Predation of indigenous fauna by feral cats and dogs.
- Encroachment by alien species of flora and fauna.
- Cliff stabilisation.
- Rockfall netting and fencing.
- Accessing of the site by residents of nearby areas.

4.5 Conservation Direction

The Talus Slopes comprise a unique and important habitat in Gibraltar, especially since the isthmus' sandy habitat has been almost totally urbanised. Together with the Great Sand Slopes, they are a refuge for sand-loving and sand-dwelling species of flora and fauna. With this in mind, part of the action plan of the isthmus habitat is not only to conserve what is left of it but also to transfer species of flora and fauna to the Talus and Great Sand Slopes. This has already been achieved in part by the restoration of the Great Sand Slopes with the re-seeding of native species, in particular those that were scarce or had become extinct. In the same way invertebrate species should be transferred to both these habitats.

Conservation measures should include:-

- Re-seeding and transfer of key plant species from isthmus habitat.
- Introduction of key invertebrate species and transfer from isthmus habitat.
- Removal of invasive species, especially *Carpobrotus edulis x acinaciformis*, *Agave americana* and *A. ghiesbreghtii*.
- Regular monitoring of flora and fauna.
- Prohibition of destructive activities such as motor cycle scrambling.

5. GREAT SAND SLOPES



Figure 7: The Great Sand Slopes forming a butress against the east cliffs (L. Linares).

The Great Sand Slopes form an extensive area of approximately 45ha of wind blown sands that extend from above Sandy Bay in the south to Catalan bay to the north. These sands, which contain a high percentage of uniform quartz grains, originated outside Gibraltar, since there is almost no quartz bearing strata on the Rock. The sand slope was formed during the Quaternary period when the area to the east was a dry sandy plain, by wind action that deposited the sand upon existing scree breccias and boulder conglomerate (Rose & Rosenbaum, 1991).

At one time the Talus slopes to the north and south, together with the Sand Slopes, formed one contiguous mass. However, the Catalan Bay and Sandy Bay quarries, opened by the Admiralty in 1895 to provide material for the Dockyard extensions, isolated the Great Sand Slopes from the Talus slopes. The talus extremities, located below the major cliff faces below Spyglass and Rock Gun seem to have accumulated the largest quantity of rock boulder material. This has formed the conglomerate scree breccias, but is still covered by a sandy layer. The central portion, where the Great Sand Slopes are located, has undergone less rock deposition from above, but has a greater accumulation of windblown sands, substantially differentiating this geological structure from the adjacent Talus slopes. A borehole on the lower part of the slope indicated at least 40m of sand present at this location (Rose & Rosenbaum, 1991).

Drawings from the 1800s depicting Catalan Bay show the Sand Slope almost devoid of vegetation, with goat herds present. The devastating effects that goats have on the vegetation are well documented (See Chapter 6), and the presence of these animals on the Slopes would have caused extensive environmental damage in the form of habitat loss and erosion.

In the late 1970s the Public Works Department of the Gibraltar Government opened a quarry at the base of the Sand Slopes, with the intention of using the sand for building material. The quarrying was soon stopped for the operation was dangerously undercutting the slope and rendering it unstable, placing in danger the stability of the Water Catchments. The operation was transferred to the top of the slope at the base of the cliff where machinery was installed for the removal and transfer of the sand down the slope. Problems were immediately encountered, for the sandy material at the base of the cliff was intermixed with boulders, some extremely large, that had fallen from above. Eventually the quarry was deemed unviable and closed down, but by then a substantial amount of sand had been removed that created a terrace over 100m long and 10m wide. This venture has had the unplanned consequence of creating a rock catchment

area that traps falling rocks and has rendered the lower stretch of highway between the Caleta Hotel and Sandy Bay relatively safe. The quarry has also provided a level area that has been recolonised by wildlife.

In the early 1900s most of the Great Sand Slopes were covered with corrugated iron sheets that formed a Water Catchment area. At the time a number of plant species were lost, and the disappearance of the Black Wheatear *Oenanthe leucura* from Gibraltar most likely resulted from the loss of this habitat. It is likely that certainly prior to the grazing of the site by goats even before the catchments were being considered, the natural community of the site included species that frequent sandy habitats in the region. These may have included plants such as the Sage-leaved Cistus *Cistus salvifolius*, the Myrtle *Myrtus communis*, and the White Broom *Retama monosperma*, reptiles such as the Spiny-footed Lizard *Acanthodactylus erythrus*, and other birds such as the Spectacled Warbler *Sylvia conspicillata* and the Dartford Warbler *Sylvia undata*. The water catchments were divided into two areas, with the north the responsibility of the Gibraltar Government and the south of the MoD. This structure was rendered obsolete with the advent of desalination plants. The removal of the Water Catchments required the stabilisation of the underlying sands. GONHS was consulted and a meshed netting of degradable material, that would allow plants to grow through, was installed upon removal of the sheets. GONHS, through the Gibraltar Botanic Gardens, was also contracted to reseed the slopes, and this was done using sand-loving native grasses and shrubs.

An extensive area above the southern end of Catalan Bay that did not form part of the water catchments was, in the past, planted to stabilise the sands. Rooikrans *Acacia cyclops* and the Canary Island Date Palm *Phoenix canariensis* were used extensively in this area as well as the Century Plant *Agave americana* and Spineless Yucca *Yucca elephantipes*, all non-natives. The *Acacia* and the *Agave* in particular are potentially-damaging invasive species.

5.1 Current Status

5.1.1 LEGAL STATUS

The Great Sand Slopes are currently not designated as protected areas under local legislation, but several species of flora and fauna found on the slopes are covered by the 'Nature Protection Ordinance 1991'. The Great Sand Slopes are part of a candidate special area of conservation (cSAC) under the Habitats Directive. This habitat is listed under a *Malcolmeitalia* (dune Malcolmia annual-herb community) dune grassland (NATURA 2000 code: 2230; CORINE 91:16.228) on a stabilised sand dune. It is regionally important, as sandy littoral zones have been urbanised throughout coastal Andalusia, and as a geological and landscape feature is of global importance.

5.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

The Great Sand Slopes provided a unique opportunity for fulfilling one of the main requirements of the Biodiversity Convention, under Article 8(f) which states:-

“Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies”

Representations by GONHS led the Gibraltar Government to agree to replant the slopes in order to stabilise the exposed sand once the sheeting was removed. Seeds were collected locally, and in adjacent coastal habitats for those species where enough seeds were not available locally, or which were locally extinct, and re-seeding began in 1997.

Table 8: Species used for seeding the Northern Sand Slopes.

Common Name	Scientific Name
Wild Leek	<i>Allium ampeloprasum</i>
Marram grass	<i>Ammophila arenaria</i>
Snapdragon	<i>Antirrhinum majus</i>
White Asphodel	<i>Asphodelus albus</i>
Spiny Broom	<i>Calicotome villosa</i>
Dwarf Fan-palm	<i>Chaeromops humilis</i>
Cocks Foot	<i>Dactylis glomerata</i>
Wild Carrot	<i>Daucus carota</i>
Squirting Cucumber	<i>Ecballium elaterium</i>
Sea Holly	<i>Eryngium maritimum</i>
Giant Tangier Fennel	<i>Ferula tingitana</i>
Yellow-horned Poppy	<i>Glaucium flavum</i>
Hoary Mustard	<i>Hirschfeldia incana</i>
Tree Mallow	<i>Lavatera arborea</i>
Sweet Alison	<i>Lobularia maritima</i>
Wild Olive	<i>Olea europea</i>
Gibraltar Restharrow	<i>Ononis natrix</i>
Sea Orlaya	<i>Orlaya maritima</i>
Cottonweed	<i>Otanthus maritimus</i>
Silver Parynochia	<i>Parynochia argentea</i>
Smilgrass	<i>Piptatheim miliaceum</i>
Buck's-horn Plantain	<i>Plantago coronopus</i>
Dock sp.	<i>Rumex sp.</i>
Sweet Scabious	<i>Scabiosa atropurpurea</i>
Silver Ragwort	<i>Senecio bicolor</i>
Pink Mediterranean Catchfly	<i>Silene colorata</i>
Sticky Catchfly	<i>Silene nicaeensis</i>
Blunt-leaved Catchfly	<i>Silene obtusifolia</i>

Natural, wind-blown seeding must also have taken place and surveys in 1998 and 1999 revealed a total of 59 and 83 species respectively, with an overall cover of 60%, ranging from up to 80% in some areas down to 10% in places where the matting had not been adequately fixed and had compromised the development of the plants.

Some alien species that were found in the adjacent areas to the catchments have also begun to invade the open areas of the Sand Slopes. Particularly worrying is the Rooikrans *Acacia cyclops* and to a lesser extent the Century Plant *Agave americana*. The former has the potential to cover large areas of the slope smothering low shrubs and plants, and should therefore be included in a species eradication and control plan under this Biodiversity initiative.

Table 9: Alien species found growing on the Sand Slopes.

Common Name	Scientific Name
Rooikrans	<i>Acacia cyclops</i>
Golden Wreath Wattle	<i>Acacia saligna</i>
Century Plant	<i>Agave americana</i>
Green Century Plant	<i>Agave ghiesbreghtii</i>
Tree Aloe	<i>Aloe arborescens</i>
Hottentot Fig	<i>Carpobrotus edulis x acinaciformis</i>
Red Gum	<i>Eucalyptus camaldulensis</i>
Shrub Tobacco	<i>Nicotiana glauca</i>
Prickly Pear	<i>Opuntia ficus-indica</i>
Bermuda Buttercup	<i>Oxalis pes-caprae</i>
Cape Wattle	<i>Paraserianthes lophantha</i>
Canary Palm	<i>Phoenix canariensis</i>
Spineless Yucca	<i>Yucca elephantipes</i>

A few years later, the Ministry of Defence decommissioned their section of water catchments. Re-seeding was successfully carried out in a similar fashion to the previous operation. As part of this endeavour a specific condition for the acceptance of this work in relation to the vegetation cover required the following:

“Criteria for acceptance of the vegetation.

The vegetation will be adjudged to have successfully established on the basis of plant density/percentage coverage and on the diversity of species as defined below:

After two years average, coverage should be 60% with no areas less than 40%. Diversity will be measured by selecting 10 in number 15m² plots at random; these should contain at least 10 species. 50% of the plots should contain at least 15 species. If these criteria are not met then selective reseedling of deficient areas should be undertaken.”

Taken from terms of reference by Gifford & Partners in Cortés *et al.* (2000).

Five surveys were carried out between April 2002 and December 2004, and a notable increase in species diversity was detected except in the autumn survey when many plant species are dormant. Most of the criteria were met except for additional seeding in four areas that was carried out during the 2004/2005 winter. The GONHS now carries out an annual survey in late spring to monitor the flora and fauna of the Great Sand Slopes.

In addition to the removal of the Water Catchment and the reseedling of the slopes, the MoD installed a complex network of strong fencing, as protection against rockfalls. Three lines of defensive fencing were installed to protect the residential complex of Both Worlds that lies immediately below the slope.

This particular project is an example of the work that GONHS has carried out in relation to some of the requirements of the Biodiversity Convention.

5.2 Current Factors affecting Habitat

Acacia cyclops, an alien invasive, is affecting the long-term well-being and integrity of the habitat on the Great Sand Slope.

5.3 Current Action

No action is being taken at present, but a habitat management programme to eradicate *Acacia cyclops* is urgently required before the problem worsens.

5.4 Threats

Potential and existing threats include:

- Risk of fire.
- Expansion of the invasive shrub *Acacia cyclops*.
- Urban development of the base of the Sand Slopes leading to the loss of some habitat and the installation of extra rockfall defences.
- Feral cats and dogs.

The risk of fire on any habitat in Gibraltar is great due to the dry conditions that prevail during the summer and early autumn. The situation on the slopes is aggravated because the composition of the sandy substrate is extremely porous and does not hold moisture for any length of time. Therefore the vegetation tends to dry out quicker than similar vegetation on limestone habitat. However, fire is a natural element of grassland ecosystems and is important for their long-term survival, preventing encroachment by woody plants. It is nevertheless essential that fires do not occur too often, that they do not affect the area during those times of year when the fauna is breeding and that they only affect part of the slopes on any one occasion.

In late summer 2005, youths playing with flares on the lay-by at the base of the Sand Slopes, allegedly set fire to the vegetation (See fig.8). The northern area was affected as the flames quickly spread upwards, burning the remnants of the matting and the wooden framework that had been left in place after the removal of the corrugated sheeting. With the first rains of the year, most of the vegetation returned, but several species were lost, including *Otanthus maritimus*, which had been established following local extinc-

tion. Among the survivors were Olive bushes that re-sprouted from the roots and the invasive Golden Wreath Wattle *Acacia saligna*, but the Rooikrans *Acacia cyclops* was killed outright. Future surveys will be required to assess the area, with a provision for reseedling any species that may have been lost as a result.



Figure 8: Great Sand Slopes, autumn 2005 showing the burnt section at the top of the picture.

The alien *Acacia cyclops* is slowly invading the sand slope areas where the water catchments have been removed. This *Acacia* stand was originally planted above the Caleta Hotel, in a section of the sand slopes that did not form part of the water catchments. Alongside this area, a section of water catchments blew off in a strong westerly gale in 1976, and immediately new *Acacia* plants established themselves. This is again occurring on the exposed sand slopes and within two years of the removal of the catchments, plants had established themselves widely. Most of this new growth is restricted to the lower margins of the Great Sand Slopes, but it may only be a question of time before this invasive species spreads to the upper reaches of the slope.



Figure 9: The burnt area of the Great Sand Slopes, spring 2006 with fresh growth.

There is at present a development boom in Gibraltar, and the eastern side of the Rock has not escaped the attention of developers. A new residential development, 'Little Genoa', is being built in an area between Catalan Bay and the Caleta Hotel. This area is notoriously dangerous, for most of the recent rockfalls that have taken place in this area in the last 50 years have occurred here. Even Catalan Bay's great rock icon, 'La Mamela' must have originated at the top of the Rock, and crashed through this spot. Another speculative residential project, south of the Caleta Hotel was fortunately rejected by the Development and Planning Commission, but there are indications that the Sandy Bay residential area of 'Both Worlds' may seek to extend their housing complex.

Any development of the coastline from eastern beach to Sandy Bay would probably mean further rock-fall protection measures, including anchoring of loose or potentially unsafe areas of the cliff, netting and other works, involving grouting and concreting large tracts of the cliff face. This is unreasonable, unsightly and costly and the implications should be considered fully should any future development plans be proposed to the Development and Planning Commission.

The presence of Feral cats seems to be a problem that has increased in recent years. Feral dogs have also been found in the site in the past. Cat culls used to occur at regular intervals, but now seem to occur only when a problem that is highlighted by the general public or when the potential transmission of diseases to humans becomes a concern. Only then do we see a concerted effort to eliminate cats in particular areas, and even then there is opposition from sectors of the public and indeed the Cat Welfare Society, who believe that feral cats deserve a place in the wild. They are an alien, damaging species that do not have a legitimate role within our wildlife communities.

A pack of dogs roamed the sand slopes in the late 1900's and obviously managed to survive in the wild. They had to be shot since they posed a menace to members of the public. A survey in the 1990's using hidden cameras to assess the fox population of the Nature Reserve after rabbit carcasses were discovered in several places, revealed a feral dog to be the culprit. The dog was of the breed known as 'podenco', used by hunters in Spain, and had probably escaped from its owners. A dog of this breed was seen roaming the sand slopes in April 2006.

5.5 Conservation Direction

This recent history of the Great Sand Slopes is certainly a success story, but they need to continue to be monitored closely.

Measures to be taken:

- Removal of invasive species, especially *Acacia cyclops*, *Carpobrotus edulis x acinaciformis* and *Agave americana*. (See Alien Invasive action plans).
- Removal of feral cats.
- Re-seeding where necessary and transfer of key plant species from the Isthmus and Talus habitats.
- Introduction of key invertebrate species and transfer from the Isthmus and Talus habitats.
- Introduction of other plant species of sandy habitats in Cadiz Province, Spain.
- Re-introduction of the Black Wheatear and the Spiny-footed Lizard.
- Regular monitoring of flora and fauna.

6. THE ISTHMUS



Figure 10: Remnants of the Isthmus habitat on the North Front Aerial Farm and at the foot of the North Face.

The Isthmus is the narrow stretch of land up to three metres above sea-level and three kilometres long between the Sierra Carbonera and the North Face of the Rock that links the Rock to the mainland. It was formed by the deposition of sand brought down by the rivers Palmones and Guadarranque in the Bay of Gibraltar to the west, and the river Guadiaro to the east. The prevailing easterly and westerly winds formed an intricate low dune system interspersed by hollows that flooded in the winter. The underlying geology is composed mainly of marine sands and clays dipping towards the Rock, forming an aquifer that lies relatively close to the surface in the area of North Front, where several wells are sited. The vegetation of the area was composed of low-lying grasses and sedges together with other shrubs and bushes including the Bitter Fennel *Foeniculum vulgare* and *Dittrichia viscosa*.

The isthmus is Gibraltar's only land connection with Spain. Historically, it was not an ideal place for a settlement, since it was exposed to the elements and did not afford the protection that could be found a few hundred metres away within the City walls, under the shelter of the Rock itself. It did provide some residents with pasture for their livestock and enabled some cultivation of crops in the few sheltered spots (Portillo, ca.1620). Under the British occupation the isthmus remained undeveloped, since it was in the direct line of fire from the Spanish fortifications and therefore too dangerous. Known as 'no-man's land', it remained in a wild natural state throughout the 18th and 19th centuries. Border posts were located at either end of the Isthmus and the intervening land was referred to as the Neutral Ground.

A relaxed political atmosphere with Spain saw the development of the isthmus into a recreational area with the establishment of the Victoria Gardens, sporting facilities and a horse racecourse, but with the

advent of the second world war the airfield was built on the isthmus and extensive works began, resulting in the development of most of the isthmus area south of the Spanish border into airport infrastructure which was extended to include residential areas for the military. The only remnants of the isthmus habitat that remained were garden areas at North Front residential area, a tract of land that was set-aside as a cemetery for the burial of the local inhabitants and another section adjacent to Devil's Tower and the North Face of the Rock, which was developed into the aerial farm. Even these areas have slowly shrunk as more and more of the land has been utilised, with the resulting loss in the habitat and biodiversity.

6.1 Current Status

6.1.1 LEGAL STATUS

What is left of the isthmus habitat is composed of small parcels of land that form the remnants of a unique dune and slack habitat. None of these have any direct environmental protection, but many of the species occurring there are protected under the 'Nature Protection Ordinance, 1991'.

6.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

The remnants of the isthmus habitat contain an interesting community of flora and fauna that is not found elsewhere in Gibraltar and is rare in the region.

Access to the largest remaining area of the isthmus, the MoD Aerial Farm, was formerly restricted, but following the recent removal of the aerals, GONHS surveyed the area during three visits in 2005. Several interesting plant and invertebrate species were found there.

6.2 Current Factors affecting Habitat

Western beach is being encroached upon by the extension of bathing facilities that have recently been erected. Rubbish deposition and its use as a toilet by beachgoers are also polluting the sand dunes.

The North Front Cemetery has no environmental development plan, and therefore any free area is taken over by grave and mausoleum developers. In the last fifteen years, the last empty sectors of the Cemetery have been developed, including the vegetated northeastern corner where trees and shrubs have been removed to allow for extra graves. No dimension restriction for graves or other guidelines seem to apply and a lack of proper planning has led to areas becoming a concrete blanket as grave after grave is built with no room between each for landscaping. Recent moves to refurbish the Cemetery paths may not resolve this completely and a proper management plan is required.

The Aerial Farm was handed over to the Gibraltar Government in 2005. The area still has a lot of old cable anchor points and concrete bases and the remains of a large aerial in the centre. The southern sector is used as a car park for a Security firm and was extended for use as the beach car park in the summer of 2005, in lieu of the original car park that is being developed as part of the eastside development. After the summer, cars from Bassadone Motors were allowed to park there, covering a large part of the area.

The aerial farm below the North face, south of Devil's Tower Road, has been left untouched, as it is a high-risk rockfall area.

6.3 Current Action

None, with the exception of occasional floral and faunal surveys.

6.4 Threats

Western Beach is under threat from a proposed reclamation project, for car parking facilities for the private company Bassadone Motors. This would extend the land area adjacent to the north side of the runway. Depending on the final configuration, this may have an adverse effect on the sand dune habitat if the beach disappears in part or completely.

Currently the North Front Cemetery is an environmental disaster. It is practically a concrete extension of the runway, with its few green corners fast disappearing. Apart from posing a threat to its special fauna and flora, the Cemetery is also visually unattractive. Much could be done to improve the cemetery, both for wildlife and visitors.

The aerial farm is now a car park and the remaining area is under threat for use for parking facilities for beach users in the summer and Bassadone's cars during the rest of the year. The east side reclamation project will put further development pressure on this unique area.

The south aerial farm is under no apparent threat and should be conserved immediately.

6.5 Conservation Direction

The two large areas of Isthmus habitat that remain on either side of Devil's Tower Road, together with the Western beach sand dunes, require protection.

The North Front Cemetery requires an environmental management plan to ensure that the requirements of the area as a cemetery are compatible with sound environmental practices and that the area is kept in a condition that will be agreeable to the general public whilst ensuring that the natural environment is not adversely affected.

The Aerial Farm could provide space as a new Cemetery if proper environmental management and landscaping would form part of the general plan for the area.

The habitat adjacent to the North Face could be established as a conservation area, under the Nature Protection Ordinance, since rockfalls make it too dangerous for development. Some re-seeding and translocations could be carried out here.

7. SOUTH DISTRICT



Figure 11: View of part of the South District of Gibraltar.

The South District, here regarded as the area of Gibraltar south of the Alameda Gardens, but not including the Upper Rock, holds a variety of habitats such as open-ground pseudosteppe, garigue and some small pockets of low maquis and woodland. It is especially important for cliff habitats, including an important habitat in Annex I of the Habitat Directive under 'Vegetated sea-cliffs of the Mediterranean coast' especially those with endemic *Limonium spp.* A large proportion of the South District consists of residential urban and garden areas. However, the South District includes several distinct areas that have been individually surveyed and classified according to their biodiversity importance, threats and action required. These are:

- Windmill Hill
- North Gorge/Buena Vista
- Jacob's Ladder
- Europa Point Foreshore
- Governor's Cottage Camp
- Hole in the Wall
- Beefsteak area
- Europa Flats
- Camp Bay
- Little Bay
- Rosia

7.1 Current Status

7.1.1 WINDMILL HILL:

This is a Ministry of Defence area that is regularly used for military training purposes, with two shooting ranges, two communication aeriels enclosures, an assault course, and abandoned buildings used for training purposes in an area called Buffadero village.

Windmill Hill is a flat limestone raised beach for much of its northern half, sloping to the south and bordered on three sides by vertical cliffs. The vegetation consists mainly of low grasses and herbaceous plants with lentisc and olive bushes on the southern slopes and the more sheltered areas. It holds a distinctive community of plants, many of which are found only at this location. A major stronghold for the Barbary Partridge, where approximately ten pairs breed successfully, it is also the most important stopover location in Gibraltar for migrant passerine birds, with a database, kept by GONHS, dating back some 45 years (Cortes, 1996).

It is afforded protection as a MoD Conservation Area, and has its own specific action plan (In Bensusan & Perez 2003).

7.1.2 NORTH GORGE / BUENA VISTA:

The North Gorge area has impressive geological limestone karst features that are unique to the region. It is heavily faulted, with majestic ivy-clad cliffs interspersed with numerous fissures, some of which develop into caves, several containing archaeological remains. Bounded on either side by the Windmill Hill and the Buena Vista cliffs, the gorge itself is humid receiving limited amounts of sunlight. The floor of the gorge is level and most of the area has been built upon, although most buildings are now derelict. The MoD has its water desalination plant installation at the southern end, the Gibraltar Pistol Shooting Club has its premises on what used to be a workers hostel and the adjacent site is an open garage full of derelict cars. The gorge continues north through a maze of derelict buildings above which stands the Naval Hospital and a new development called The Cliftons. Europa Road runs along the upper gorge and to the east are several residential cottages and another new development called Highcliffe House. The corner below Devil's Bellows is heavily fractured with large limestone boulders strewn around and is densely vegetated with the remnants of 'Mediterranean Arborescent Matorral', Matorral with sweet laurel *Laurus nobilis*, which is listed as Priority habitat under Annex I of the Habitats Directive and requires the designation of a Special Area of Conservation (SAC).

There are numerous interesting trees and plants including several Dragon trees *Dracaena draco* with one particularly old specimen, one of Gibraltar's three known Round-leaved Oaks *Quercus rotundifolia*, many Hawthorn bushes *Crataegus monogyna*, Sweet Laurel *Laurus nobilis*, and the most spectacular ivy *Hedera helix* clad cliffs in the region. Several interesting cliff dwelling species of plants occur including the Gibraltar Candytuft and the Caper *Capparis spinosa*, both protected under the Nature Protection Ordinance.

The caves in this area require protection for their historical and natural heritage value.

The Buena Vista site lies to the west of North Gorge and consists mainly of cliffs that are more exposed to the sun. These cliffs hold an important plant community that includes Giant Tangier Fennel *Ferula tingitana*, Gibraltar Sea Lavender *Limonium emarginatum*, Caper *Capparis spinosa* and a unique population of the rare white form of the Fragile Bellflower *Campanula velutina*. Blue Rock Thrushes breed on these cliffs.

7.1.3 JACOB'S LADDER:

This vegetated corner to the west below Windmill Hill, bordered by Europa Road, contains a dense maquis habitat that is quite unlike anything found in the South District. Sheltered from the strong levanter but exposed to the strong westerly winds, the area is a haven for many interesting plants including orchids, and is used as shelter and a stopover site by migrant birds and as a breeding and roosting site by Barbary Partridges.

7.1.4 FORESHORE:

The Europa Foreshore is the narrow strip of land that slopes gently into the sea immediately below the walls and cliffs at Europa Point, bordering the Strait of Gibraltar. It was held by the MoD and used as an aerial farm with a small residential area in the centre. The area is now in the possession of the Gibraltar Government and the residential area has been incorporated within the local housing stock.

The Foreshore is exposed to the elements, in particular the eastern sector that is swept by the easterly

gales and salt spray, and is unsuited to all but the hardiest of plants, including the Gibraltar Sea Lavender *Limonium emarginatum*, a salt-resistant species with its stronghold in this habitat. It comes under Annex I of the Habitat Directive under 'Vegetated sea-cliffs of the Mediterranean coast' especially those with endemic *Limonium spp.* and therefore requires the designation of Special Area of Conservation (SAC). Unfortunately it also harbours many of Gibraltar's alien species of flora that have escaped from the gardens of the residential area and have become naturalised in this zone (see Chapter 6).

7.1.5 GOVERNOR'S COTTAGE CAMP:

The area in question runs north-to-south along the base of the east cliffs bordering Windmill Hill as far as the area north of the Refuse Incinerator. Governor's Cottage Camp is in a derelict state, as are most of the buildings to the north, including the old Refuse Incinerator.

The whole area is a haven for alien, invasive species of plants, and has few remnants of the original native flora and fauna. This is with the exception of the cliffs, whose flora includes Gibraltar Candytuft *Iberis gibraltarica*, Gibraltar Sea Lavender *Limonium emarginatum*, and Joint Pine *Ephedra fragilis*, the latter a host species for the endemic beetle, *Buprestis (Yamina) sanguinea calpetana*. Nesting birds include Peregrine *Falco peregrinus*, Little Owl *Athene noctua* and Blue Rock Thrush *Monticola solitarius*.

7.1.6 HOLE IN THE WALL:

The area was once open, garigue habitat with low-growing grasses and shrubs that suited many native species of plants and was a favourite feeding area for the Barbary Partridge and Blue Rock Thrush. It contained some alien species that included the Prickly Pear *Opuntia ficus-indica*. In the last decade, for reasons as yet unknown, this species of cactus has become a serious invasive that has smothered all but the resistant Dwarf Fan Palm *Chaemerops humilis*, which still manages to grow through this mass.

This area also contains a rock quarry that is used as a refuse dump, which is frequented by the Yellow-legged Gulls and a group of Barbary Macaques.

There is also a promontory occasionally used by the Clay Pigeon Shooting Club that is in an abandoned and disgraceful state, with cartridges strewn all over the site and on the cliffs below.

7.1.7 BEEFSTEAK AREA:

This is the narrow strip of land below the southern cliffs of Windmill Hill and bordered by Europa Road where Beefsteak cave is situated. Mainly composed of a scree slope containing tunnelling debris, the area adjacent to the cliff harbours an interesting community of invertebrates and flora that benefit from the south-facing location of the area.

The unsightly, disused pipeline that runs along the cliff base all the way to the Refuse Incinerator mars the area.

7.1.8 EUROPA FLATS:

These consist of the whole area around Europa Point, which like Windmill Hill Flats is a raised beach. Mainly urbanised, the area also contains gardens and small pockets of natural habitat, amongst which is the viewing platform at Europa Point commonly referred to as the Mound, which harbours many interesting native plant species.

The area around the Nun's Well was landscaped for the opening of the Mosque, but the plant species selected were not suited to the harsh climatic conditions and perished.

7.1.9 CAMP BAY:

This area is unique in that the steep slope bordering the Buena Vista cliffs is composed of mudstones and shales. Surrounded by limestone cliffs, the area has an interesting community of plants and the slope is heavily vegetated with maquis consisting mainly of Lentisc and Olive scrub.

7.1.10 LITTLE BAY:

Formed and extended by a former rock quarry, the area is also surrounded by majestic limestone cliffs with an important and extensive plant community including the Gibraltar Sea Lavender. The substrate of the area is mainly composed of limestone debris; remnants of the quarrying operation. Vegetation in the area is limited to the cliff base.

7.1.11 ROSIA:

This area lies below the fortification walls and the Parson's Lodge cliffs, and consists of a narrow strip

of land with minimal vegetation cover but including the Gibraltar Sea Lavender. Within the Parson's Lodge site is an interesting area with natural herbaceous vegetation and shrubs. The shoreline of this area and is dealt with below under the Inter-tidal zone and Marine habitats.

7.2 Current Factors affecting Habitat

7.2.1 WINDMILL HILL:

The spread of several invasive species is seriously affecting the area. The most serious is the Kikuyu Grass *Pennisetum clandestinum* that spread from the former Navy Satellite Installation into the adjacent area. It has also been found growing around the Rifle Shooting range and along the roadway leading south-west. Others include the Hottentot Fig *Carpobrotus edulis x acinaciformis*, and the Tree Aloe *Aloe arborescens*.

Works by the MoD in this site, and military exercises potentially damage the ecology if, as often happens these are carried without consultation and due care and/or at sensitive times of the year.

Tentative plans for a power station and wind turbines in the area are of extreme concern as both would impact strongly on the landscape value of the site and potentially have serious effects on the ecology and on migratory birds.

An artificial pond that was constructed in the early 1980s was damaged several years ago and is in need of restoration.

7.2.2 NORTH GORGE / BUENA VISTA:

Several development projects have and are being carried out that are affecting the habitat of the area. The most serious factor is the alleged need for cliff stabilisation around every development under construction, with meshing, scraping and concreting severely affecting the important cliff habitat.

A large urbanisation development project is planned that could seriously affect the integrity of the whole area.

Much of the area requires a geological survey to assess the suitability for high-rise buildings in some locations.

7.2.3 JACOB'S LADDER:

No current factors are affecting the habitat of this area.

7.2.4 FORESHORE:

Extensions to the residential area and the indiscriminate disposal of building debris, surplus domestic appliances and refuse in the surrounding area is contaminating the soil and smothering the native flora. One of the residents has installed a chicken coop and released rabbits in the area.

Several species of alien invasive flora can be found at this location, among which the Agave, Hottentot Fig and Prickly Pear have seriously extended their ranges, smothering a large area.

7.2.5 GOVERNOR'S COTTAGE CAMP:

Extensive colonisation by alien invasive plants in the past is seriously affecting the habitat of this area. Species include the Aloe, Hottentot Fig, Agave and the Cape Ivy. Very little of the original native habitat remains, other than on the cliffs above, where cliff stabilisation works have recently been carried out.

This beautiful area of coastline with its magnificent sea cliffs was once used as a dumping ground and is now an eyesore. The cliff habitat is in many places covered with the remains of scrap that are seriously affecting the well-being of the cliff habitat. Illegal dumping in the area remains a problem. The cliff area is singularly unattractive in the areas where it is littered with all sorts of items. The old Car Chute and the dump site opposite the Refuse Incinerator is still used for illegal dumping as can be seen by the amount of material that is strewn around the cliff edge, affecting the native plants growing there.

There are derelict cars on the roadway leading up to the Refuse Incinerator and Feral Chickens running loose in the area.

7.2.6 HOLE IN THE WALL:

The habitat has been devastated by the invasive Prickly Pear, which has smothered most of the natu-

ral vegetation in the area. The area is also affected by the foraging habits of a group of Barbary Macaques.

Indiscriminate dumping over the cliffs of material that is not allowed at the refuse tip is seriously affecting the cliff habitat and the marine environment in this area. The whole area is a smelly eyesore, albeit with the magnificent backdrop of the eastern side cliffs.

The shot cartridges at and below the Clay Pigeon Shooting Club cover extensive areas of the cliffs that smother the native plants. They are also affecting the marine environment.

There is also a mattress burning compound, spewing noxious fumes into the atmosphere, which is littered with the remaining metallic spring skeletons, many dumped over the cliffs that can be seen on the rocks below. This is compromising and polluting the cliff habitat.

7.2.7 BEEFSTEAK AREA:

No factors are currently affecting the habitat.

7.2.8 EUROPA FLATS:

The area around the Nun's Well is commonly used by car and motor cycle riders for off-roading, which destroys natural vegetation and does not allow it to regenerate. This practise regularly takes place on the Europa Mound, destroying the vegetation and quickly eroding the paths.

7.2.9 CAMP BAY:

An alien invasive plant, the Cape Wattle *Paraserianthes lophantha*, is suffocating the native vegetation on the slope. This species is included in Chapter 6 (Alien, Invasive and Pest species action plan).

The mudstone slope is unstable and requires shoring up with a strong retaining wall before there is a serious landslide that will obviously affect the integrity of the slope's habitat.

A Feral Cat colony is established at this site, compromising the wildlife in this habitat. The cats are regularly fed by cat lovers.

7.2.10 LITTLE BAY:

The slopes around the area need to be cleared of rubbish and litter. A colony of Feral Cats is also located in this area.

7.2.11 ROSIA:

No factors are currently affecting the habitat.

7.3 Current Action

7.3.1 WINDMILL HILL:

The alien invasive plants in this area are currently being monitored and those requiring attention are being tackled by GONHS in collaboration with the MoD.

7.3.2 NORTH GORGE / BUENA VISTA:

The Caves and Cliffs section of GONHS is currently monitoring and surveying the caves in the area and have recently uncovered the entrance to Judge's Cave that had been buried under rubble.

No action is currently being taken on the habitat of the area, although there has been much objection by GONHS to the cliff stabilisation that continues to take place.

7.3.3 JACOB'S LADDER:

No action is currently being taken.

7.3.4 FORESHORE:

No action is currently being taken, although the elimination of several of the alien invasive plants is a requisite under its specific action plan.

7.3.5 GOVERNOR'S COTTAGE CAMP:

No action is currently being taken, although the elimination of several of the alien invasive plants is a requisite under its specific action plan.

7.3.6 HOLE IN THE WALL:

No action is currently being taken, although the elimination of several of the alien invasive plants, especially the Prickly Pear, is a requisite under its specific action plan.

7.3.7 BEEFSTEAK AREA:

No action is currently being taken.

7.3.8 EUROPA FLATS:

No action is currently being taken.

7.3.9 CAMP BAY:

No action is currently being taken, although the elimination of the alien invasive plant the Cape Wattle and of the Feral Cat is a requisite under its specific action plan.

7.3.10 LITTLE BAY:

No action is currently being taken.

7.3.11 ROSIA:

No action is currently being taken.

7.4 Conservation Direction**7.4.1 WINDMILL HILL:**

The suggestions and recommendations in Bensusan & Perez (2003) should continue to be addressed. These would include implementation of a formal management plan for the area. In spring 2005 a team from Defence Estates in UK came to assess the incorporation of MoD land within the Habitats Directive candidate Special Area of Conservation (SAC) and supported the recommendation. In relation to that part of Windmill Hill under MoD control (*i.e.* south of the parade ground), the re-instatement of the MoD Conservation Group would make a very positive contribution.

Consideration of the area as a site for the location of wind turbines must be resisted in view of their impact on migratory birds which focus on this area.

The plans for a power station should be reviewed and the site changed to the Europa Advance area below the cliff, where visual impact and effect on migratory birds, as well as of the effluent plumes, would be greatly reduced.

7.4.2 NORTH GORGE:

Monitor the habitat and investigate the extent of the new proposed development, and seek an EIA. Ensure the survival of the Oak tree and Dragon Trees. Designate the north-eastern sector (between Windmill Hill Road and Highcliffe House) as a conservation area for its valuable Bay Laurel and Hawthorn stands.

7.4.3 JACOB'S LADDER:

Monitor the development of the habitat and survey the area for flora and fauna.

Continue migrant bird surveys in this area in conjunction with Windmill Hill.

7.4.4 FORESHORE:

The establishment of an Alien Invasive eradication programme to eliminate the large quantity of invasive plants found there.

The removal of all building debris, refuse and materials dumped around the residential and adjacent areas.

Removal of the Chicken coop and elimination of feral rabbits.

Requires designation as a conservation area for its unique, large population of the Gibraltar Sea Lavender, linked to its interesting Inter-tidal zone and the Europa Reef.

7.4.5 GOVERNOR'S COTTAGE CAMP:

The area in question could continue to be used as an industrial area, and extended to absorb a relocat-

ed power station, but any development in the area should have aesthetic qualities that should blend in harmony with the scenic beauty of this area of Gibraltar.

Chicken coops and derelict cars in this area should be removed.

The old car chute gateway and concrete slope should be removed and the original wall rebuilt.

The dumping hole opposite the entrance to the Refuse Incinerator should be sealed and its associated structure removed.

The cliffs around the dumping area should be cleared of scrap, mangled metal debris and refuse to allow natural vegetation to regenerate.

7.4.6 HOLE IN THE WALL:

The establishment of an eradication programme for the removal of the Prickly Pear and other invasives from this area.

Embellishment of the Clay Pigeon Shooting Club compound and removal of refuse and cartridges from the surrounding area.

Removal of all scrap and debris from cliff areas, and erection of signs prohibiting dumping.

Establish an environmentally friendly method of mattress disposal and restore the site back to its natural state in order to improve the habitat.

Assess the future of the Barbary Macaque group established at this location.

7.4.7 BEEFSTEAK AREA:

The area, habitat and aesthetic value of the site would benefit from the removal of the disused pipeline, and associated concrete bases and structures.

7.4.8 EUROPA FLATS:

The area around the Nun's Well requires landscaping with salt-resistant species of shrubs and plants. The area should be protected from encroaching vehicles.

The area around the Europa mound requires embellishment with the addition of salt-resistant native plant species and the removal of alien species.

7.4.9 CAMP BAY:

The area requires the urgent removal of the invasive plant *Paraserianthes lophantha* from the slope and replacing with suitable native species.

Stabilisation of the slope is urgently required.

Removal of all Feral Cats from the area.

7.4.10 LITTLE BAY:

Requires the removal of all refuse and debris found within the vegetation.

Removal of all Feral Cats from the area.

7.4.11 ROSIA:

The future development and use of Rosia Bay is still uncertain. When proposals for this area are submitted, an environmental impact assessment should take into consideration the cliff habitat and also provide green areas in this otherwise mostly concreted zone.

7.4.12 SOUTH DISTRICT OVERALL

The South District, as defined above, would greatly benefit from having an overall plan allocating future projects in the whole of the area in an environmentally sensitive way, rather than in the haphazard way that they are being developed. This could easily be produced by a small, multi-disciplinary team,

8. URBAN GREEN AREAS



Figure 12: Westview Park, a good example of landscape architecture incorporating some native species.

Until the early 1990s, green areas in urban zones were given little importance by the authorities and it was only as a result of the improvements in the Costa del Sol, and in particular Marbella, that the Government worked at improving the appearance of built-up Gibraltar. A firm of horticultural contractors was engaged to improve the appearance of planted areas in Gibraltar, and in particular the entrance into the town area from the frontier.

Urban Green Areas consist mainly of gardens, roadside verges, avenues and planted areas within the town area and suburbs. As well as the Alameda Botanic Gardens, the most significant are the large gardens of the Mount, the Convent, Rock Cottage, Engineer House and Westview Park. Smaller garden areas are scattered around the town area and include the Garrison Library, Bristol Hotel and Europort Gardens, but the majority of small gardens and urban green areas are in the South District.

The Alameda Botanic Gardens, inaugurated in 1816 by the then Lieutenant-Governor of Gibraltar, George Don, houses a range of exotic plants from around the world, but also contains a variety of native species. The Gardens have progressed from being an ordinary park to a botanic garden whose aim is to promote and enhance its collection through the creation of thematic beds, including the Mediterranean bed with many of Gibraltar's interesting native plants. It also contains an important seed bank of local species, and aims to create public awareness of our rich botanical heritage through the creation of an interpretation centre, and its frequent guided walks and literature.

The Mount gardens contain a locally unique collection of ancient native trees, many of them remnants of Gibraltar's original vegetation. These include Algerian Oak *Quercus canariensis*, Bay Laurel *Laurus nobilis*, and Nettle Trees *Celtis australis* (probably a long-established introduction), but also some exotic species including Magnolias *Magnolia grandiflora*, Indian Laurel *Ficus microcarpa*, Atlantic Cedar *Cedrus atlantica*, Dragon Trees *Dracaena draco* and many shrubs.

The Convent Gardens also house a wonderful collection of mature exotic trees including *Araucaria bildwiddii*, Norfolk Island Pine *Araucaria heterophylla*, some very old Dragon trees *Dracaena draco*, several Palm trees *Phoenix sp.* and other exotic and native trees and shrubs. It also contains possibly the oldest Carob tree *Ceratonia siliqua* in Gibraltar, many of its branches held up on supports.

The Trafalgar Cemetery also contains many mature trees and several old Dragon trees are also located in the Garrison Library gardens. All these gardens include, among their exotic species, important collections of Gibraltar's natural botanical heritage.

The rest of the smaller gardens in Gibraltar, such as Westview Park and those found in the South

District, contain mainly younger trees, including Olive *Olea europea* and other native species but also many exotic species of herbaceous plants and shrubs. These small pockets of vegetation are important refuges for wildlife including birds, reptiles and invertebrates and provide links with other habitat areas.

Roadside verges, tree avenues and estate boundaries are usually planted with exotic species, adding colour and greenery throughout the year. Prime examples are the vegetated entrance into the town area from the frontier and Rosia promenade. They are appealing to the public and also to wildlife, with exotic flowers providing nectar for insects and branches providing perching and nesting places for birds and invertebrates.

Urban green areas as a whole provide a habitat for other wildlife, being important, if not treated with chemicals, as foraging areas for House Sparrows *Passer domesticus*, and also used by Blackbirds *Turdus merula*, Sardinian Warblers *Sylvia melanocephala* and Blue Tits *Cyanistes cyaneus* for nesting and feeding, and by species such as Robins *Erithacus rubecula*, Black Redstarts *Phoenicurus ochruros*, Blackcaps *Sylvia atricapilla* and Chiffchaffs *Phylloscopus collybita* in winter.

8.1 Current Status

8.1.1 LEGAL STATUS

The major gardens in Gibraltar do not have any legal protection, although they should for their historical and natural heritage value.

A Tree Preservation policy was initiated by GONHS and adopted by the Development and Planning Commission, aimed at protecting Gibraltar's trees, and these include many within and some outside the gardens themselves.

8.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

The Tree Preservation Policy was prepared in 2002 and adopted by the Development and Planning Commission. Based on a system of assessments of tree values used both in the United Kingdom and the United States, the principle adopted was one that trees in Gibraltar had to be protected and managed sensitively. One of its main aims was to ensure the protection of Gibraltar's oldest and rarest trees. Trees (and green areas) were mapped and categorised and incorporated into the Gibraltar Government's GIS mapping scheme that will facilitate the assessment of new developments on the Rock. The Policy states that any tree whose removal is inevitable (such as for safety reasons) needs to be replaced, and builds on the procedure to issue Tree Preservation Orders by introducing a formal procedure. This however needs to be established firmly by legislation.

The Alameda Botanic Garden continues its efforts to conserve Gibraltar's rare plants through planting and re-introduction schemes. The garden also maintains and continues to improve its native plant seed bank.

8.2 Current Factors affecting Habitat

Several factors are adversely affecting green areas:

- Unnecessary, often annual pruning by Horticultural Contractors.
- Over-zealous, unsustainable pruning and topping of trees, leaving them unable to recover, and even causing disease and death.
- Pruning at wrong times of year during drought conditions.
- Illegal pruning/poisoning of trees that block views or shop-fronts by the public and shop-owners. Such incidents are currently not investigated or prosecuted.
- Little or no consultation when removing trees or clearing green areas.
- Insufficient consultation on species selection for planting leading to the threat of alien invasives being introduced.
- Use of pesticides and herbicides in green areas without regard to invertebrates in particular.
- Green areas used as dog toilets.
- Unnecessary strimming of ground vegetation in areas such as road verges and Alameda Estate.
- Westview Promenade lawns being used as a sports-ground and as a beach area in summer (although swimming is prohibited)

8.3 Current Action

There are tentative plans to integrate Engineer House gardens as a garden area within a new proposed

development.

No other actions are taking place currently.

8.4 Threats

Green areas are under threat of being given over to development. An example in question is the Europort Gardens that has been destroyed to make way for a swimming pool and car-parking facilities, although with the condition that green areas be re-established.

With exceptions, such as Ocean Village in Marina Bay, Little importance has been given to incorporating green areas into developments.

Green areas, in beguiling artists' impressions in development planning proposals, often do not materialise on completion.

8.5 Conservation Direction

The authorities should incorporate landscape architecture within their remit and develop a Gibraltar landscape plan. This would not only beautify Gibraltar but would also benefit biodiversity and provide an inspiring living environment, which would contribute to human well-being.

Action should be taken by the Department for Trade and Industry, the Town-Planners Office and the Ministry for the Environment.

Consultation should take place with the GONHS, Heritage and Planning Division, the Heritage Trust and the Gibraltar Museum.

Action required:

- Incorporation of landscape architecture within proposed and existing developments.
- Development of an environmental strategy for green areas.
- Establishment of a Tree Preservation Ordinance based on the Tree Policy and incorporating the procedure for issuing Tree Preservation Orders.
- Establishment of legal protection and conservation measures for major gardens.
- Formalisation of consultation processes within Government Departments, NGO's and other bodies.
- Representation of native species within planted zones.
- Establishment of a code of practice for the Horticultural Contractors.
- Strict control of the use of pesticides and herbicides

9. URBAN AREAS



Figure 13: A view of the Town of Gibraltar.

The inclusion of Urban areas within 'habitats' may come as a surprise, but the buildings and structures of towns and cities are attractive to a wide range of wildlife. For example, buildings are substitutes for cliff habitat for many species of birds that use the convenient recesses and eaves found in buildings and roofs as nesting sites. These recesses are warm during the winter months, providing important roosting sites for bats.

Storage facilities, water tanks and underground structures, including sewers, provide refuges and breeding sites for a broad range of wild species that have over the years adapted to living in these artificial conditions and are now more commonly found in urban areas than in the wild.

Human activity also inadvertently and unintentionally provides a food source for wildlife, in the form of food storage facilities, discarded refuse or the active feeding of birds.

The most common vertebrate species of wildlife found in the Urban habitat are given in Table 10:

Table 10: Common Urban wildlife.

Common Name	Scientific name
Feral cat	<i>Felis catus</i>
Feral Pigeon	<i>Columba livia</i>
European Free-tailed Bat	<i>Tadarida teniotis</i>
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>
Black Rat	<i>Rattus rattus alexandrinus</i>
Brown Rat	<i>Rattus norvegicus</i>
House Mouse	<i>Mus domesticus</i>
Kestrel	<i>Falco tinnunculus</i>
House Sparrow	<i>Passer domesticus</i>
Blackbird	<i>Turdus merula</i>
Common Swift	<i>Apus apus</i>
Pallid Swift	<i>Apus pallidus</i>
Spotless Starling	<i>Sturnus unicolor</i>
Moorish Gecko	<i>Tarentola mauretanicus</i>
Turkish Gecko	<i>Hemidactylus turcicus</i>
Iberian Wall Lizard	<i>Podarcis hispanica</i>

Many species (Table 11) have become adapted to living indoors as pests in houses and in food storage facilities:

Table 11: Invertebrate groups found commonly indoors.

Order	Family	Common Name
Thysanura	<i>Lepismatidae</i>	Silverfish, Firebrats
	<i>Thripidae</i>	Thrips
Collembola		Springtails
Dermaptera	<i>Forficulidae</i>	Earwigs
Neuroptera	<i>Chrysopidae</i>	Lacewings
Orthoptera	<i>Gryllidae</i>	Crickets
Isopoda	<i>Oniscus</i>	Woodlice
Myriapoda	<i>Chilopda</i>	Centipedes
	<i>Diplopda</i>	Millipedes
Dictyoptera	<i>Blattidae</i>	Cockroaches
Pscoptera		Booklice
Coleoptera	<i>Derместidae</i>	Hide & Leather Beetles
	<i>Anobidae</i>	Biscuit/Cigarette Beetles
	<i>Ptinidae</i>	Spider Beetles
	<i>Carabidae</i>	Ground Beetles
	<i>Staphylinidae</i>	Rove Beetles
	<i>Bostrychidae</i>	Wood/Grain Borers
	<i>Cleridae</i>	Chequered Beetles
	<i>Cucujidae</i>	Bark/Grain Beetles
	<i>Silvanidae</i>	Flat Grain Beetles
	<i>Tenebrionidae</i>	Flour Beetles
	<i>Bruchidae</i>	Seed Beetles
	<i>Anthribidae</i>	Fungus Weevils
	<i>Curculionidae</i>	Weevils
	<i>Nitidulidae</i>	Sap/Fruit Beetles
	<i>Lathridiidae</i>	Plaster Beetles
	<i>Cryptophacidae</i>	Mould Beetles
<i>Mycetophagidae</i>	Fungus Beetles	
Diptera	<i>Culicidae</i>	Mosquitoes
	<i>Drosophilidae</i>	Fruit Flies
	<i>Muscidae</i>	House Flies
	<i>Calliphoridae</i>	Blow, Flesh Flies
	<i>Psychoidea</i>	Drain/Filter Flies
Lepidoptera	<i>Tineidae</i>	Clothes Moths
	<i>Oecophoridae</i>	House Moths
	<i>Pyralidae</i>	Dried Fruit Moths
Hymenoptera	<i>Formicidae</i>	Ants
	<i>Vespidae</i>	Wasps
Acaridae		Mites

(National Britannia Ltd, 1998)

Many plants have also found a refuge in fissures and recesses in the old city walls and on some of the older buildings in the Upper Town. In most cases they do not harm the structure of the walls, as their root systems are incapable of penetrating and enlarging the fissures. They provide colour and an aesthetic value to the character of the upper town. Nevertheless there are some species that can do serious damage if they are permitted to grow unchecked. The most serious is the Fig Tree *Ficus carica* and other, introduced *Ficus* species that can be seen growing on occasions on the City Walls.

Table 12: Main urban species of flora.

<i>Achyranthes sicula</i>	<i>Lactuca tenerrima</i>
<i>Amaranthus blitoides</i>	<i>Lamarckia aurea</i>
<i>Amaranthus lividus</i>	<i>Lavatera cretica</i>
<i>Anacyclus radiatus</i>	<i>Linaria tristis</i>
<i>Anogramma leptophylla</i>	<i>Lobularia maritima</i>
<i>Antirrhinum majus</i> ssp. <i>cirrhigerum</i>	<i>Lotus collinus</i>
<i>Antirrhinum majus</i> ssp. <i>tortuosum</i>	<i>Malva sylvestris</i>
<i>Asplenium ceterach</i>	<i>Medicago lupulina</i>
<i>Asplenium trichomanes</i> ssp. <i>quadrivalens</i>	<i>Medicago polymorpha</i> ssp. <i>polymorpha</i>
<i>Asteriscus maritimus</i>	<i>Melilotus indica</i>
<i>Bidens pilosa</i>	<i>Mercurialis annua</i> ssp. <i>ambigua</i>
<i>Biscutella megacarpaea</i>	<i>Nicotiana glauca</i>
<i>Borago officinalis</i>	<i>Oxalis articulata</i>
<i>Campanula erinus</i>	<i>Oxalis corniculata</i>
<i>Campanula velutina</i>	<i>Oxalis pes-caprae</i>
<i>Cardamine hirsuta</i>	<i>Parietaria judaica</i>
<i>Carduus pycnocephalus</i>	<i>Parietaria lusitanica</i>
<i>Carduus tenuiflorus</i>	<i>Parietaria mauritanica</i>
<i>Centranthus ruber</i> ssp. <i>ruber</i>	<i>Phagnalon saxatile</i>
<i>Centranthus calcitrapae</i>	<i>Phytolacca americana</i>
<i>Chenopodium album</i> ssp. <i>album</i>	<i>Picris echioides</i>
<i>Chenopodium ambrosioides</i>	<i>Piptatherum miliaceum</i>
<i>Chenopodium murale</i>	<i>Poa infirma</i>
<i>Coronopus didymus</i>	<i>Polycarpon tetraphyllum</i>
<i>Cymbalaria muralis</i> ssp. <i>muralis</i>	<i>Sagina apetala</i> ssp. <i>apetala</i>
<i>Cyperus rotundus</i>	<i>Sedum album</i>
<i>Dittrichia viscosa</i> ssp. <i>viscosa</i>	<i>Senecio vulgaris</i>
<i>Erigeron bonariensis</i>	<i>Sisymbrium irio</i>
<i>Erigeron sumatrensis</i>	<i>Sisymbrium officinale</i>
<i>Erodium chium</i> ssp. <i>chium</i>	<i>Solanum nigrum</i> ssp. <i>nigrum</i>
<i>Erodium moschatum</i>	<i>Solanum villosum</i>
<i>Eucalyptus camaldulensis</i>	<i>Sonchus oleraceus</i>
<i>Eupatorium rugosum</i>	<i>Sonchus tenerrimus</i>
<i>Euphorbia helioscopia</i>	<i>Spergularia marina</i>
<i>Euphorbia peplus</i>	<i>Stellaria pallida</i>
<i>Ficus carica</i>	<i>Symphyotrichuym squamatum</i>
<i>Freesia refracta</i>	<i>Torilis arvensis</i> ssp. <i>neglecta</i>
<i>Fumaria capreolata</i> ssp. <i>capreolata</i>	<i>Trachelium caeruleum</i> ssp. <i>caeruleum</i>
<i>Galium murale</i>	<i>Umbilicus horizontalis</i>
<i>Geranium purpureum</i>	<i>Umbilicus rupestris</i>
<i>Glebionis coronaria</i>	<i>Urtica membranacea</i>
<i>Helichrysum rupestre</i>	<i>Verbena officinalis</i>
<i>Heliotropium europaeum</i>	<i>Veronica cymbalaria</i>
<i>Hyoscyamus albus</i>	

9.1 Current Status

9.1.1 LEGAL STATUS

Urban areas do not have any legal conservation protection measures, other than that afforded to individual species by the Nature Protection Ordinance. Nevertheless there are historic buildings within those areas that do have protection for their historic value and are considered listed buildings. The list of such buildings is currently being assessed by the Gibraltar Heritage Trust and the Gibraltar Government with the collaboration of the Heritage and Planning Division.

9.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

Many of the older buildings in the town area were constructed in a way that inadvertently provided cavities and recesses for the large population of Common and Pallid Swifts. Most were bestowed with tiled, pitched roofs with space under the eaves that were ideal resting and nesting places for the birdlife and for bats. Since then, building practices have changed and new roofs tend to be flat, with few cavities available.

The loss of many old buildings with their large colonies of swifts impelled GONHS to publish a leaflet to guide developers in providing cavities in roofs and incorporating bat and swift boxes within new developments. That publication, 'Bats and Swifts in Buildings' (Santana & Cortes, 1996), made several observations and recommendations including:

- Bats and swifts are a natural insect control.
- Roofs are used as roosts and nurseries by bats.
- Demolition and remedial works should be timed to avoid the breeding season.
- A licence under the Nature Protection Ordinance is necessary when works are unavoidable.
- Alterations to roofs should accommodate use by bats.
- New roofs and buildings should provide nesting sites for swifts.
- Artificial nests should be incorporated in new and existing buildings.

In 2004, many artificial nests were incorporated on to the buildings around Varyl Begg Estate. It is gratifying to see that the Development and Planning Commission is implementing some of these recommendations, and all new developments should also follow this initiative.

The development of new constructions with flat roofs in Gibraltar should incorporate the new building concept of green roofs. Both pitched and flat roofs can be provided with a green cover. The benefits are great, not least to biodiversity and the environment. They also provide other benefits to the building itself.

- Due to the high degree of insulation that they provide, green roofs are known for their ability to stabilise temperature throughout the year. During the winter they keep the heat in and in the summer they provide a relatively cool environment.
- Green roofs also have the ability to soften harsh edges of buildings in sensitive environments, making them blend in with the surrounding area.
- Turf and green roofs provide an ideal habitat for non-pest insects and other wildlife.
- They replace the habitat that has already been lost in green zones.

9.2 CURRENT FACTORS AFFECTING HABITAT

The urban habitat is rapidly expanding and encroaching on green habitats.

The Gibraltar Development Plan 1991 is outdated and obsolete. Indeed, until recently there has been no attempt to devise an urban strategy for Gibraltar, which would incorporate building developments within the overall habitat structure of Gibraltar. An example of the lack of coordination between projects is seen in the proposals for developing the Lathbury Barracks area, where it was decided to establish an industrial park. At the same time, a new prison is to be located there. There are also plans for a relocated Power Station and a seven storey luxury housing unit in the most exposed location of this area, partially obstructing the view of the Strait from the prime tourist viewing point at Jews' Gate.

Representations are made to the Development and Planning Commission by the NGO's represented there (GONHS and the Gibraltar Heritage Trust) when proposals affect heritage and/or the environment. The Commission's decisions need to be backed by hard facts and current development strategies, which takes account of environmental concerns including those enshrined in the Environment Charter adopted by the Government in spring 2006. This inevitably requires that a new development plan, the drafting of which began in 2004, be finalised as soon as possible.

9.3 Current Action

None.

9.4 Conservation Direction

A new Gibraltar Development Plan is urgently required to set out an overall development strategy for Gibraltar that will incorporate the needs of the natural environment.

The new Gibraltar Development Plan should incorporate adequate strategies for environmentally friendly building practices within developments. These should include:

- Energy-efficient building designs.
- Solar panels and wind turbines.
- Environmentally engineered structural insulating panels.
- Bioshield™ paints that contain virtually no toxic, volatile, organic compounds.
- Eco-friendly, recycled building materials such as tiles, flooring, glass, etc.
- Recycled plastic lumber for exteriors (as recommended for the Nature Reserve fencing by Perez & Bensusan 2005).

These and other environmentally friendly building practices could form part of a 'Green Building Ordinance', a document that is commonly utilised by many municipalities worldwide, which would set out the requirements of green building practices and future building construction. Such practices would primarily address water management, reduction of energy consumption, the use of sustainable and recyclable building materials and the provision of green areas, roofs and terraces.

Further Reading:

- **Sustainable Building Task Force and the State and Consumer Services Agency. (2001)** *Building Better Buildings. A Blueprint for Better Sustainable Facilities.* The State of California.
- **City of Oakland Public Works Agency.** Green Building requirements for city building projects and traditional public works projects. www.oaklandpw.com
- **US Department of Energy.** *Green Building Guidelines. Meeting the Demand for Low-energy Resource-efficient Homes. Fourth Edition.* Building America. The Sustainable Buildings Industry Council.
- **Kats, G., et al. (2003)** *The Costs and Financial Benefits of Green Buildings. The Sustainable Building Task Force.* The State of California.
- **Kidd, J.,** *Optimum Green Roofs for Brisbane.* Student Thesis. Abstract in www.greenroofs.com. The LEED (Leadership in Energy and Environmental Design) Green Building Rating System® www.usgbc.org

10. CAVES



Figure 14: Lower St. Michael's Cave (T. Berge).

The limestone Rock of Gibraltar has a wealth of natural caves, with over 143 recorded by George Palao in the 1960s and 70s (Palao, *Unpubl.*). Many other caves that were formed during periods of glaciation can now be found below the present sea-level. Some caves were formed by the action of rainwater eroding cavities or shaping faults, (e.g. the St. Michael's caves series, while others were largely formed by the action of the sea. Examples of sea caves can be found at Governor's Beach, which is lined with several, among them Gorham's Cave which has rich archaeological deposits. Even caves high up on the Rock, like Martin's Cave and Goat's Hair Twin Caves, are examples of sea caves originally formed at sea level. Another particular area of Gibraltar, North Gorge, is geologically significant because it is riddled with faults and fissures that can be identified with 'karst' scenery. Situated between the limestone plateaus of Windmill Hill and Buena Vista, this area contains important caves like Judge's, Glen Rocky Shelter, Horseshoe and Glen Rocky Cave amongst others. Many of these contain important archaeological deposits while others have held important colonies of bats.

Caves, by their nature, have a stable environment buffered against the daily, seasonal and longer-term surface climatic conditions. They provide a stable, sheltered, moist refuge for animals that would not otherwise survive on the surface. Green plants do not survive in the complete darkness of caves so the food supply for cave creatures must ultimately come from the surface. This is usually in the form of plant material that is swept in by rainwater through cracks and fissures, roots that penetrate deep into the ground in fissures, or animals that fall or are swept underground and are unable to find their way out. The cave ecosystem depends entirely on the surrounding surface environment. The vegetation, nature of the soil and water quality and availability is crucial to this ecosystem, and therefore karst areas are particularly vulnerable and should be treated with special care to ensure the survival of cave ecology.

Many caves in Gibraltar contained colonies of Schreiber's and Mouse-eared Bats that numbered in the thousands (Palao *Unpubl.*), but in recent years there has been a marked decline with only a few hundred Schreiber's Bats remaining in Martin's Cave in the late 1980s. Since then this colony has also been lost

despite the best efforts to minimise disturbance by the erection of grilles and fences to prevent access. Prospecting bats may eventually recolonise some of the caves if proposed cave management and conservation measures are enforced (Perez & Bensusan, 2005).

Cave entrances are also a refuge for many animals and plants for they provide a stable atmosphere where the wildlife can find moisture even in the height of the summer months. Mosses, algae, fungi and several higher plant species find the walls and deeper recesses of the cave walls, where daylight penetrates the darkness, to their liking. In the summer months a fly species (Diptera) aestivates on the cave walls in its millions, which may provide a source of nutrients to bats within the caves and in the immediate area. Holes and ledges in roofs of the cave entrances provide nesting places for Pallid and Alpine Swifts, Spotless Starlings, Wrens and warm and sheltered roosting places for hundreds of Crag Martins in the winter months. Ledges in the caves at Governor's beach are used as nest sites by Western Mediterranean Shags.

10.1 Current Status

Many of the accessible caves in Gibraltar are in a dilapidated state. Those along the Mediterranean Steps are strewn with litter and many cave walls are covered with graffiti. Martin's Cave, the last cave to hold a colony of bats, was until recently protected with fencing and a grille to prevent access, however, this has been vandalised and removed.

Bray's Cave, a rock shelter on the Upper Rock Nature Reserve, was the site of an archaeological dig in 2002. The site now remains in an abandoned state with large pits and a grid of wires that constitutes a safety hazard and is a danger to the public. The dig material has been deposited on several levels outside the cave.

The Governor's Beach series of caves was most likely compromised by the extraction of sand offshore for the Europort reclamation project. The beach was subsequently lost as a result and the waves now break very close to several of the cave entrances and wash the cave deposits away. Gorham's Cave was also the site of an ongoing archaeological dig and much of the infrastructure and grid of wires are also in place and constitute a hazard for wintering Crag Martins and other wildlife, including possibly bats.

Old St. Michael's Cave, one of the main tourist sites on the Upper Rock Nature Reserve, is in a poor state. Most of the formations are now dead (*i.e.* dry without any further accumulation of calcium carbonate being deposited by rainwater filtrations), and covered in a coating of dirt. Visitor numbers are not restricted and this is further aggravating the natural state of this cave. This cave contained a particular species of woodlouse *Iberoniscus beruili*, a cavernicolous species that was collected in 1950 under rotten wood deep in the cave (Easter, 2005). Most of the cave was covered in concrete and converted into an auditorium, but there remain many areas where the species may have survived.

Poca Roca Cave, situated within the residential complex of the same name within the Upper Rock Nature Reserve, lies directly behind one of the houses. The cave, which held important archaeological artefacts, was fitted up as the residence of the Governor in 1789, but never used (Palao, 1969).

The Tourist Board manages new St. Michael's Cave, which contains a small freshwater lake. Visits are controlled, and guided by experienced personnel. This cave is being used for a scientific project to assess climate change patterns, in a collaborative programme between the Royal Holloway College of London University and GONHS.

There are many caves and fissures in the North Gorge area, amongst which Glen Rocky, Glen Rocky Shelter and Judge's Cave are the largest. Judges Cave entrance was buried under piles of rubble in-between the foundations of the old Workers Hostel, and was recently uncovered by members of the GONHS Caves and Cliffs section. Glen Rocky Shelter Cave lies at the base of the western cliff of the Gorge. It was used as a bomb shelter during WWII, and has been used by bats in the past (Palao, *Unpubl*). The North Gorge area is heavily faulted with many deep fissures running North West-South East, joining up with Devils Falls Cave in Camp Bay, running under the Buena Vista plateau. This area is a prime example of the karst scenery, with limestone pavements, fissures and gorges with sinkholes, which require conservation and protection.

Ragged Staff Cave, located deep in Ragged Staff tunnel, lies below the Alameda Grand Parade car park. It is a unique, large cave, containing a small lake where the fresh upper layers merge with the lower, salt-laden ones. Members of the Gibraltar Museum have discovered a small, unidentified crustacean in the lake, and this species will probably be new to science (D. Fa, *pers. comm.*). Other discoveries may yet

await discovery within the depths of this cave.

10.2 Current Factors affecting Habitat

Several factors can and do affect the caves of Gibraltar, although only those that can have an effect on biodiversity are listed below:

- Accidental and intentional disturbance to bats in caves.
- Deposition of rubbish and use of the cave as a toilet.
- Illegal digging in search for archaeological artefacts.
- Disturbance to cave ecology and wildlife by archaeologists.
- Alterations caused by urban developments.

10.3 Current Action

An assessment together with recommendations for the conservation and management of the caves within the Upper Rock Nature reserve was prepared in Perez & Bensusan (2005). Action on the recommendations, including that which calls for the creation of a Cave Management Committee has not yet been taken.

10.4 Threats

The North Gorge area is earmarked for development. The area has several important caves, with some of the caverns lying directly below part of the proposed site. The area is also heavily faulted with numerous fissures running mainly south-west to north-east and south to north. It suggests strong geological tectonic movements in the past and it is suggested that it is not the ideal location for a residential area, as any earthquake shocks may be accentuated along this faulted zone. Proposed houses on Buena Vista plateau may also damage part of the cave systems beneath.

10.5 Conservation Direction

The recommendations published in Perez & Bensusan (2005) should now be implemented. A Cave Management Committee should be established, under the guidelines stipulated within the report, which would address the conservation needs of all caves, both from an archaeological and a biological point of view, harmonising any possible conflict between these. Particular caves that are accessed by the public (e.g. those along Mediterranean Steps) should have information panels depicting their main historical and natural aspects and values.

There is a need to establish a research programme to assess the cave ecology and biodiversity value of all caves in Gibraltar. This would include surveys for bats, invertebrates and other wildlife found all the way from the entrances right into the depths of the caves.

Marine Habitats

The marine habitats and marine sites are found within an area around Gibraltar that stretches to three miles east and south of the Rock and to a median line dividing the territorial waters of Gibraltar and Spain in the Bay of Gibraltar in accordance with the 1958 Geneva Convention on the 'Territorial Sea and Contiguous Zone, between British and Spanish territorial waters'. They also include the intertidal zone, the coastal area washed by the tides. Amongst the different habitats, sites and benthic types referred to here are:

- The Intertidal Zone
- The Artificial Reef
- Reefs and inshore rocky outcrops
- Sand
- Marl
- Rock

The distribution of the main benthic types and the inshore rocks and reefs are shown in Figure 15.



Figure 15: Main benthic types found in Gibraltar waters.
The purple areas are inshore rocks and reefs.

In addition Gibraltar's open waters comprise a pelagic zone that has a constant interchange between the saltier, denser waters leaving the Mediterranean and the cold surface Atlantic waters that enter eastwards. The currents and upwellings within the Strait bring nutrients that stimulate the growth of plankton. Pelagic fish are attracted to feed on the plankton and predatory fish and cetaceans follow these shoals. Table 14 gives some of the fish found in mid-waters:

Table 13: Main pelagic and predatory fish found in the Strait of Gibraltar.

Common Name	Scientific Name
Pompano	<i>Trachinotus ovatus</i>
Mediterranean Horse Mackerel	<i>Trachurus mediterraneus</i>
Blue Jack Mackerel	<i>Trachurus picturatus</i>
Atlantic Horse Mackerel	<i>Trachurus trachurus</i>
Picarel	<i>Spicara flexuosa</i>
Blotched Picarel	<i>Spicara maena</i>
bluefish	<i>Pomatomus saltatrix</i>
Atlantic Saury	<i>Scomberesox saurus</i>
Bullet Tuna	<i>Auxis rochei</i>
Little Tunny	<i>Euthynnus alletteratus</i>
Skipjack Tuna	<i>Katsuwonus pelamis</i>
Atlantic Bonito	<i>Sarda sarda</i>
Chub or Spanish Mackerel	<i>Scomber japonicus</i>
Atlantic Mackerel	<i>Scomber scombrus</i>
Albacore	<i>Thunnus alalunga</i>
Northern Bluefin Tuna	<i>Thunnus thynnus</i>
Yellowfin tuna	<i>Thunnus albacares</i>
Swordfish	<i>Xiphias gladius</i>

The large Bluefin and Yellowfin tuna have migratory populations that breed in the Mediterranean and pass through the Strait of Gibraltar. Their movements were well known to the Romans who erected inshore intercept nets in their path to catch them. This method is still used along the Mediterranean, but as catches have dropped many fisheries have ceased operation. The La Linea net used to catch large quantities of the large tuna but in the last twenty years only the Bullet Tuna *Auxis rochei*, known as Melva in Spain, was being caught in any numbers. The La Linea operation ceased altogether in 1997.

Many large species of predatory fish, mainly of the tuna family, are highly prized as culinary items, especially by the Japanese. Their fishing fleets have followed Tuna shoals worldwide and have decimated their numbers. The populations within the Mediterranean have not escaped their wide 'net', and most of the tuna catches, in the remaining traditional pen nets known as 'Almadrabas' in the Tarifa and Barbate area, are sold directly to Japanese fishing boats. They also lay intercept drift nets many kilometres long (which are outlawed in the European Union) and longlines to catch tuna and in the process also catch and drown numbers of dolphins, whales and sharks.

In summer 2005, the GONHS observed Japanese fishing vessels unloading tons of tuna, many of them immature fish, in Gibraltar. The fish were snap-frozen in special, refrigerator containers for transport to the Spanish port of Algeciras for trans-shipment. Further investigation is required to establish and ensure that Gibraltar is not being used as a port to by-pass international or European quotas for fresh-caught fish.

Cetaceans are also prominent in the Bay and the Strait (Table 14) and both Common Dolphin *Delphinus delphis* and Striped Dolphin *Stenella coeruleoalba* have nurseries in these areas (Shaw, 1998). Whales are also occasionally seen. 'Cetacean watching' has developed into a tourist industry in Gibraltar, Tarifa, and more recently La Linea, with several Dolphin boats operating in these areas (See Cetacean species action plan).

Table 14: Main cetacean species found in the Bay and Strait of Gibraltar.

Common Name	Scientific Name
Minke Whale	<i>Balaenoptera acutorostrata</i>
Fin Whale	<i>Balaenoptera polysalus</i>
Humpback Whale	<i>Megaptera novaeangliae</i>
Common Dolphin	<i>Delphinus dephis</i>
Pilot Whale	<i>Globicephala melaena</i>
Risso's Dolphin	<i>Grampus griseus</i>
Killer Whale	<i>Orcinus orca</i>
Striped Dolphin	<i>Stenella coeruleoalba</i>
Bottle-nosed Dolphin	<i>Tursiops truncatus</i>
Sperm Whale	<i>Physeter macrocephalus</i>
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>

Unconfirmed sightings of one other marine mammal, the Mediterranean Monk Seal *Monachus monachus*, has been reported on a couple of occasions by scuba divers (E. Shaw *pers. comm.*), and one spent several days in waters around Gibraltar in August 2006. It is a very rare species, with a global population of only 200-300 animals. It once occupied a wide geographic area in the Mediterranean and was also found on some of the Atlantic Islands. It is listed as critically endangered in the World Conservation Union (IUCN) Red List and is also listed on Appendix I of the Convention on International Trade in Endangered Species (CITES).

Our marine wildlife includes several turtle species, which are sighted occasionally.

Table 15: Turtle species that pass through the Strait of Gibraltar.

Common Name	Scientific Name
Loggerhead Turtle	<i>Caretta caretta caretta</i>
Green Sea Turtle	<i>Chelonia mydas mydas</i>
Leatherback Turtle	<i>Dermochelys coriacea coriacea</i>

Strong currents and upwellings occasionally bring concentrations of baitfish and other marine organisms into the Strait and Bay. Amongst the most significant are the visible shoals of red Boar fish *Capros asper*, ('Chavitos') and occasionally Sprat *Sprattus sprattus*. When a shoal surfaces to escape predatory fish below it is often preyed upon by dense flocks of Yellow-legged Gulls. At other times the gulls are after a species of swimming crab that is a much-prized bait for local sports fishermen, who are guided to them by the Gull flocks. A huge tide of pink krill, a small crustacean, can be seen in the Strait and Bay in early summer occasionally (*pers. obs.*), when many are found dead on the tideline.

The Strait is also an important site for migratory seabirds, both on passage and in winter, and a feeding site for the Balearic Shearwater *Puffinus mauretanicus* and the Cory's Shearwater *Calonectris diomedea*. Indeed, the Strait of Gibraltar is recognised formally as an Important Bird Area by BirdLife International (2004).

The main threats affecting the marine habitats and sites are:

- The risk of oil spillage from bunkering operations throughout the Bay, fuel storage and the Spanish oil refinery and associated industries.
- The risk of pollution from shipping emptying bilge tanks in the Strait area.
- Excessive use of anchorage areas to the east and west of Gibraltar affecting benthic habitats.
- The risk of invasive species being released from ballast water carried from other locations.
- The release of effluents, e.g. sewage, industrial waste and desalination plant water, into harbour waters.
- The release of untreated effluents at Europa Point sewerage outfall.
- The reclamation of low-lying inshore waters.
- Illegal seine net, gill net and rake fishing by Spanish commercial fishing boats.
- Illegal spear fishing with breathing apparatus.
- Uncontrolled scuba diving.

- Excessive disturbance of cetaceans by Dolphin tour operators, in the absence of guidelines and regulations.
- The lack of implementation of the Marine laws under the Marine Nature Reserve Regulations (L/N 143 of 1995).

Many of these threats could be addressed immediately by the Ministry for the Environment, which would make a huge difference to the marine ecosystem within a few years. The Ministry should devise a management plan for the marine ecosystem. Such a plan should implement the recommendations in this report and also the Marine Nature Reserve Regulations (L/N 1995/143) with respect to the candidate Marine Special Area of Conservation (Fig. 16). It should also provide the infrastructure and support for continual monitoring and research of the marine ecosystem, to fulfil the requirements and objectives of the Convention on Biological Diversity.

The Helping Hand Charity, one of the environmental charities associated to GONHS, and with the support of GONHS, carries out monitoring in the Bay, particularly of cetaceans (e.g. Shaw, 1998).

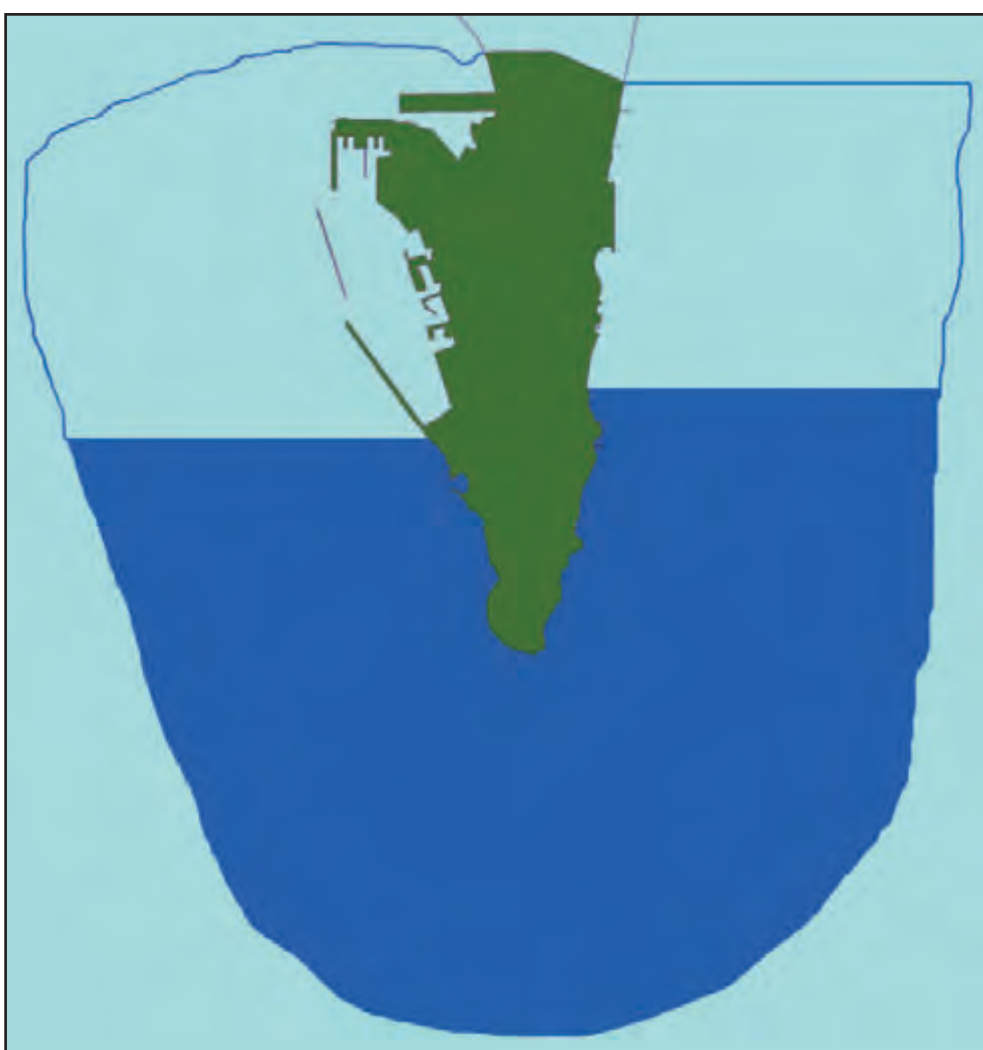


Figure 16: Gibraltar and its territorial waters and in dark blue the candidate Marine Special Area of Conservation proposed under the Habitats Directive.

The following habitat and site action plans are far from complete, as only partial information on their status is available. Work has begun, as part of the Gibraltar Biodiversity Project, to record the species in each habitat and site and provide a complete picture of the biodiversity in each area.

11. INTERTIDAL ZONE



Figure 17: A section of the Intertidal Zone at Blackstrap Cove.

The Intertidal or Littoral zone is the area between the high and low water sea-level marks and incorporates the splash zone. In Gibraltar and the Mediterranean, the intertidal zone is relatively narrow since the tidal range even during spring tides rarely exceeds 1m, and the average vertical tidal range is usually between 0.8 – 0.9m. When considering the slight gradient of the shoreline, especially on beaches, the distance between high and low water mark is approximately 3 - 4m.

The narrow strip of intertidal habitat at Gibraltar is nonetheless extremely important for a wide variety of marine organisms. It includes the vertical harbour walls, rocky shoreline and sandy or pebble beaches, each containing its variety of marine life. Of these, the rocky shoreline is by far the richest in biodiversity although there are interesting species in other intertidal biotopes that also merit conservation. Only 60% of our littoral zone remains in a natural state. The rest is comprised of the Harbour and Port area, Marinas, the Airport and reclamation areas.

11.1 Current Status

11.1.1 LEGAL STATUS

The marine area between the south side of Sandy Bay, around Europa Point and north to the southern end of the South Mole is a candidate Special Area of Conservation (cSAC) under the Habitats Directive 92/43 EEC. This obviously includes the intertidal zone and incorporates one of the best natural coastlines of this habitat in Gibraltar.

Two mollusc species that are classified under Annex IV of the Habitats Directive 92/43 EEC under 'Animals and Plant Species of Community Interest in need of strict Protection' are found in this habitat. They are the Mediterranean Ribbed Limpet *Patella ferruginea* and the Date Mussel *Lithophaga lithophaga*.

11.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

Some research carried out on the intertidal zone has produced considerable information on the marine communities. The species found include three that are included in the list of Threatened or Endangered

Species of Annex II of the SPAMI Protocol. They are

- Mediterranean Ribbed Limpet *Patella ferruginea*
- Black Limpet *Patella nigra*
- Mediterranean Seaweed *Cystoseria mediterranea*

Several research theses and dissertations have been carried out on different aspects of the Intertidal zone in Gibraltar. Ocaña (1997) studied the limpet *Siphonaria pectinata*. Others have researched the communities of marine life in the intertidal zone (J. Fa, 1990; D. Fa, 1998) and one particular study looked into the impact of the waste water effluents at Europa Point (Warr, 2004).

11.2 CURRENT FACTORS AFFECTING HABITAT

Much of the intertidal zone has undergone drastic change in the past and continues to change as new reclamation projects and other developments emerge. Much of the natural Intertidal zone has been replaced by an artificial one of a substantially different character. Whereas natural intertidal zones often sloped into shallow waters, the boundaries of the artificial zones have been extended into deeper waters. The structure of the artificial boundary and the angle of its slope greatly influence the size and species composition of this habitat. Exposure to greater wave action will also influence species selection as the larger waves allow certain species to live higher in the inter-tidal zone and select for those that will resist the strong forces without being washed off the rocks. These factors have to be considered when establishing artificial littoral boundaries.

The Intertidal zone and marine life inside the harbour was greatly compromised by the reclamation, which sealed the channel under the viaduct bridge that used to allow an ample exchange of the harbour waters with those of the Bay. The present currents are sometimes insufficient to allow floating debris to escape via the harbour entrances, and this indicates that the same holds true for the exchange of waters during the tides. The low tidal range would mean that at certain times of the year there is a degree of stagnation of the harbour waters that is likely to affect marine life within this area.

The harbour waters are also affected by effluents from the desalination plant, increasing the salinity and temperature in a corner of the harbour with low water exchange. Other effluents from industry, marinas and residential areas surrounding the harbour, and the occasional oil pollution incidents, combine to seriously decrease the biodiversity of the harbour area.

Sewage effluent at Europa Point can be detrimental since it not only contains domestic waste matter but also that from industrial establishments. Nevertheless sewage contains nitrogenous waste-based compounds that in dilution can improve the nutrient content of the waters, stimulating plant plankton growth. It can also hinder the development of marine organisms when the concentrations are excessive, but this does not seem to occur at Europa Point where the strong currents ensure that the effluent is quickly dispersed into the Strait. The shoreline receives a minimal quantity of nutrients in the immediate vicinity of the outfall, and tests carried out by the Environmental Agency on the water quality of our beaches show that the water quality complies with European guidelines (EU, 2004), and show that the Europa sewage outfall does not adversely affect our coastline. The use of salt water in our flushing and sewage systems already reduces the bacteriological content and activity of the effluent and is in effect already treating the sewage. The pumping stations, which ensure that gravity carries the effluent to the outfall, significantly reduce the solid waste to a mainly liquid form. However, the need to comply with European legislation makes it highly likely that a sewage treatment plant will be installed, as indeed the Government intends to do. Sewage treatment could have the effect of reducing the food available to the fish that feed near the site, particularly Thick-lipped Grey Mullet *Chelon labrosus*.

The Strait of Gibraltar is one of the most congested waterways in the world. On occasion unscrupulous captains empty their ships' bilges in this area, discharging quantities of oil into the sea that gets washed up on the shoreline, with the resulting adverse effects on marine organisms.

11.3 Current Action

None.

11.4 Conservation Direction

Further study of this habitat is required to assess and catalogue all the marine organisms found along the intertidal zone. An analysis of the geological composition, climatic and geographical factors of the intertidal zone in relation with species composition will provide an insight into the requirements of specific organisms and marine communities. This complete picture will enable a comprehensive report on the

Biodiversity requirements of the habitat in question. It is therefore advisable that there should be a research and monitoring programme of all marine habitats including the intertidal zone.

However, conservation action should not await the results of such monitoring, and great care needs to be taken when planning any activity or project that may impact on this habitat, in particular loss due to reclamation. Careful study to either prevent such activity or to propose actions to compensate or mitigate their effects must occur on each occasion.

Further Reading:

- **Wrigley, S., Wood, B., Wicks, L., Whiting, H., Wood, D., Willock, D., Wilson, N., Warrick, L., & Wills, A.** *Sewerage Discharge in Estuaries. A Case for trapping.*
- **Landeck Miller, R., and Fitzpatrick, J.,** *Water Quality Modelling in New York/New Jersey Harbor: A Historical Perspective on the Present.*
- **European Commission (1999).** *Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean.* Official Journal of the European Communities L322. Luxembourg.

12. ARTIFICIAL REEFS

Work on the construction of an artificial reef in Gibraltar commenced just off Camp Bay and Rosia Bay in the winter of 1975 with a small scale attempt at establishing a permanent structure using old car tyres weighed down with large stones. A second phase in the late 1970s involved the use of car chassis, arranged three across and two deep, secured with chain and shackles. These structures lasted a limited time with winter storms stripping and dispersing much of the material and corrosion decomposing the cars. The third phase of the project in 1983, ongoing still, involved the use of more solid structures: ten sunken barges covering an overall area of 4,799m² (Shaw 1996).

Since then several more vessels of larger tonnage have been sunk in the area adding to the artificial reefs' extension.



Figure 18: A Port Department vessel contributing to the Artificial Reef (E. Shaw).

Shaw (1996) noticed a dramatic increase in biodiversity of midwater and bottom-dwelling species, including sessile organisms on the barges themselves. Marine life had increased from 12 vertebrates and 22 invertebrates previously recorded in the vicinity to 54 vertebrates and 55 invertebrates once the artificial reef was in place.

12.1 Current Status

12.1.1 LEGAL STATUS

The Artificial Reef forms part of the area that is included as a candidate Marine Special Area of Conservation (cSAC) under the Habitats Directive 92/43 EEC. It has become the focus for the diving clubs and diving enterprises in the region, attracting enthusiasts from as far as Rota and Marbella in Spain and also from the United Kingdom. The rich marine biodiversity that the area has to offer has no equal in the region and has created a huge interest that is reflected in several articles in diving magazines.

12.1.2 MANAGEMENT, RESEARCH AND GUIDANCE

Monitoring of the species that colonised the Artificial Reef was carried out by the Marine section of GONHS (Shaw 1996).

Further biological monitoring of the site is an ongoing requirement.

12.2 Current Factors affecting Habitat

Incursions by Spanish seine-net fishing boats close to the area have affected and are affecting the well-being of the biodiversity of this habitat. The remains of some fishing nets have been found snagged onto the reef, and have had to be removed manually by divers to prevent the accidental catch of fish.

There is absolutely no control on diving at this site. The expertise and standards of diving clubs and companies and the number of divers that operate on this site remains unchecked. This may lead to undue disturbance to the habitat.

Strict laws regulating the marine environment were due to come into effect on the 1st January 1996 under the 'Marine Nature Reserve Regulations' (L/N 1995/143), but since the marine reserve was never formally designated these laws have never been applied.

12.3 Current Action

The Marine Section of GONHS, under Eric Shaw, who is also responsible for the Helping Hand Charity, continues to lobby for the disposal of old vessels to be incorporated within the Artificial Reef.

12.4 Conservation Direction

Laws dealing with the illegal fishing with nets by Spanish fishing boats should be enforced.

Annual and seasonal surveys of the biodiversity of the Artificial Reef and other research projects would provide a clear picture of the marine life of this habitat. This would give an insight into the habitat requirements of the species in question with a view to improving further the appropriate location and depths for future vessels to be added to the reef, enhancing the biodiversity of this habitat.

The designation of the Marine Special Area of Conservation should be closely followed by the application of the 'Marine Nature Reserve Regulations' to the designated site.

Further Reading:

- **Sheehy, D. J., (1982)** Artificial Reefs in Japan. In Murray, J. D. (ed) *Mid-Atlantic artificial reef conference, a collection of abstracts*. New Jersey Sea Grant Report, pp.78-82.
- **Stone, R. B., (1982)** Artificial Reefs: Towards a new era in fisheries enhancement? *Mar. Fish Rev.*, 44: 2-3.
- **Unger, I., (1966)**. Artificial Reefs – A Review. *Special Publication No. 4*. American Littoral Society, Highlands, New Jersey.

13. REEFS & INSHORE ROCKY OUTCROPS



Figure 19: The rocky outcrops at Seven Sisters.

Gibraltar is mainly surrounded by sand, but there are many inshore rocks and some shallow reefs among which are:

- Europa Reef
- Seven Sisters
- Governor's Beach Reef
- Sandy Bay Reef
- Eastern Beach Reef

The most significant rocky outcrop is the Europa Reef. This lies approximately southwest of Europa Point and extends from the shoreline to over 300m. The reef is one of a series of limestone beaches; Windmill Hill Flats and Europa Flats are the two that remain above sea-level as raised beaches, but the Europa Reef was submerged after the last ice-age. The Reef is fairly shallow: from 2-10m deep, but averaging about 6m, and is subjected to the strong currents and rip tides that affect the area. Its position at the entrance to the Bay and the Strait has meant that this area has become a magnet for marine life that converges on the reef for food and shelter. Europa Reef has therefore long been a popular sport fishing and scuba diving area.

The area below Napier Battery is another important rocky area for marine species. This is the area known as Seven Sisters, named after the main rocks that break the surface, and is another important marine site that harbours interesting marine life, including endemic nudibranchs (Garcia-Gomez 1983, 1987; Garcia-Gomez & Cervera, 1989). The rocks here are composed of breccias, which are softer than limestone and are similar to those found below Parson's Lodge Battery. This site is also a well-known scuba diving and sports fishing area.

The site off Governor's Beach, a pebble beach, was once a sandy bottom with interspersed rocky outcrops. In the late 1980's the area was heavily dredged for a reclamation project. This had a serious effect on the eastside coastline when, within a few years, the whole of Governor's Beach material was lost. Other beaches were also affected but not as seriously as this. The resulting effect was that the inshore sea bottom around Governor's Beach became an exposed rocky reef. This site has been colonised by rock-loving marine species.

Sandy Bay Reef is a small rocky shelf extending out some 60m from the shore and 1-2m deep. Parallel to the beach a deeper rocky shelf runs 40m out up to the southern end of the beach. This was often buried with sand but after the dredging that affected the east side it has remained exposed.

The Eastern Beach Reef is a small rocky shelf that lies 50m from the shore between the middle and the airfield groynes. This reef is frequently exposed after heavy easterlies, which remove the sandy bottom.

13.1 Current Status

The inshore rocky outcrops and reefs remain virtually unchanged except for the effects of the dredging in the 1980's that removed the sand from the eastern side of the Rock, exposing the inshore rocks and increasing that habitat, as the sandy material gradually filled-in the exposed holes.

13.2 Current Factors affecting Habitat

Several factors are affecting the biodiversity of the habitat adversely:

- Illegal net fishing.
- Excessive long-line fishing.
- Uncontrolled scuba diving.
- Uncontrolled spear-fishing.
- Illegal dumping.
- Illegal fishing by scuba divers.

All of these factors are addressed in the 'Marine Nature Reserve Regulations' (L/N 143 of 1995), but since the marine reserve was never designated these laws have never been applied.

13.3 Current Action

None.

13.4 Conservation Direction

All Marine laws protecting wildlife should be enforced.

Laws dealing with the illegal fishing with nets by Spanish fishing boats should be enforced.

The Police should regularly patrol the Europa Reef, Governor's Beach Reef, the Artificial Reef and Seven Sisters where illegal fishing with breathing apparatus, especially for octopus continues unchecked, despite reports from members of the public.

As with the artificial Reef, similar annual and seasonal surveys of the biodiversity of the Europa Reef and Seven Sisters would provide a clearer picture of the marine life of these sites. Additionally there is a need to assess the marine life of the new rocky area of the Governor's Beach Reef.

The designation of the Marine Special Area of Conservation should be closely followed by the application of the 'Marine Nature Reserve Regulations' to the designated site.

14. SAND

The majority of benthic areas in Gibraltar are composed of sand. This is the most common habitat found within Gibraltar's territorial waters, covering most of the eastern and western sides of the Rock. Nevertheless it is a particularly poor habitat for biodiversity, with few fish species, amongst which the most characteristic are:

Table 16: Main fish species found over or on sandy benthic habitat.

Common Name	Scientific Name
Lesser Weaver	<i>Echiichthys vipera</i>
Greater Weaver	<i>Trachinus draco</i>
Stargazer	<i>Uranoscopus scaber</i>
European Anchovy	<i>Engraulis encrasicolus</i>
European Pilchard	<i>Sardina pilchardus</i>
Thick-lipped Grey Mullet	<i>Chelon labrosus</i>
Bronze Bream	<i>Pagellus acarne</i>
Black Bream	<i>Spondyliosoma cantharus</i>
Striped Sea-bream	<i>Pagellus mormyrus</i>

The east side was also once a rich habitat for a wide variety of molluscs that included the following species:

Table 17: Main bivalve molluscs that are found in the east side sandy benthic habitat.

Common Name	Scientific Name
Chequered Carpet Shell	<i>Tapes decussatus</i>
Smooth Clam	<i>Callista chione</i>
Pod Razor Shell	<i>Ensis siliqua</i>
Wedge Shell	<i>Donax trunculus</i>
Corruco (Esp.)	<i>Acanthocardia tuberculata</i>
Concha de sangre (Esp.)	<i>Glycymeris insubrica</i>

The sandy beaches at Eastern Beach, Catalan Bay and Sandy Bay are frequented by many bathers, especially in the summer, and are of little ecological interest as a consequence.

14.1 Current Status

The habitat has deteriorated since the 1980s due mainly to excessive rake fishing for molluscs, which has depleted most of the species that provided the La Linea mollusc fishermen with a living. *Tapes decussatus*, a common item in the La Linea fish market in the early 1970s, has practically disappeared. *Acanthocardia tuberculata*, once the most common mollusc in the area, which was commonly used as fishing bait, was also depleted in the 1980s and became scarce. Mollusc fishermen then concentrated on the Smooth Clam *Callista chione*, a highly regarded edible species, and by the turn of the century catches of the species had dropped considerably, and immature specimens made up most of the numbers (*pers. obs.*).

The Pod Razor *Ensis siliqua* survived the onslaught because of its ability to burrow quickly into the sand, and can still be found in good numbers off Eastern Beach. The Wedge Shell *Donax trunculus* is adapted to living close inshore, within 100m, and has survived until now. Nevertheless Spanish fishing boats continue to fish inside the buoy-demarcated areas of the beaches in the early mornings and indiscriminately rake for this species. This continues despite the Nature Protection Ordinance, 1991 which prohibits both the use of rakes in Gibraltar territorial waters. The use of vessels within the demarcated buoyed areas of the beaches is also forbidden (L/N 143 of 1995).

The loss of the rich mollusc breeding grounds to the east of Gibraltar has had a serious impact on the quantity and species of fish that frequented these shores. Before the industrialisation of mollusc fishing in the 1960s, it was commonplace to catch a large variety of fish from the shoreline using beach-casting fishing methods. Sea Bass and Bream species of considerable size were frequent, but now it is rare to catch a worthwhile fish of any size (*pers. obs.*).

Rake fishing in the area of Western Beach and the Airport during the late 1990s destroyed a sensitive

area of a species of eelgrass that existed in this area (*pers. obs.*). A subsequent survey of this area to establish the presence of *Posidonia oceanica* or other eelgrasses proved fruitless (Fa, 2004). Following this, part of the site was extensively dredged for another reclamation project.

14.2 Current Factors affecting Habitat

Several adverse factors are still affecting this habitat on the eastern side of the Rock.

- Uncontrolled rake fishing by Spanish boats continues despite Gibraltar laws against this practice.
- Rake fishermen increase the size of the rake's teeth despite Spanish laws prohibiting this, but since they fish in Gibraltar waters their authorities are unable/unwilling to enforce this law.
- Despite a Spanish annual close season on mollusc fishing -a 'parada biológica' for the species to recover- Spanish boats continue to fish in Gibraltar waters during this time, knowing full well they can escape sanction as they are outside the Spanish jurisdiction.
- Net fishing continues around the Rock despite local laws against this practice.

Several proposed reclamation projects may affect the nature of the currents and the deposition of sand on the coastline. The first, Sovereign Bay, will reclaim a huge area between Eastern Beach and Catalan Bay, and extend close to 400m out. The second will reclaim an area to the north of the runway that will seriously affect Western Beach and the waters within the enclosure between the Spanish pier and the Airfield. Both will require significant environmental impact assessments. The impact of these proposed projects will need to be monitored as they may not necessarily have a negative effect and may provide additional littoral habitat, reduce coastal erosion and offer the chance of creating some onshore habitat as well.

14.3 Current Action

None.

14.4 Conservation Direction

The use of offshore sunken breakwaters would benefit sand deposition on our beaches, especially Sandy Bay. These could be built in the form of concrete modules that interlink to form a formidable offshore sunken barrier (see figs. 19 & 20). These would allow the wave action to transport the sand over the smooth sloping surface toward the beach but retain it on the steep beach-facing side, thereby depositing sand within the designated area and preventing loss in heavy levanter conditions. The blocks would need to be located at a distance beyond that of the major breaking waves during rough conditions to ensure stability, and would require enough mass and weight to resist the dynamic forces of the wave action. The result would be two-fold: sand would be deposited between the breakwater and the beach and the force of the waves would be reduced because they would break further from the shore, reducing coastal erosion.

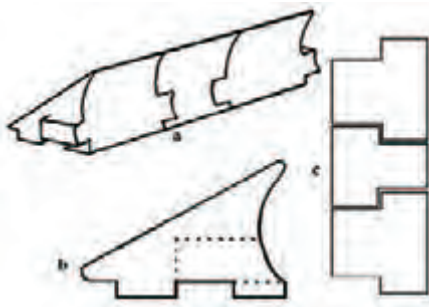


Figure 20: a. Lateral angled view of breakwater. b. Lateral view of single block. c. Birds-eye view of interlocking breakwater blocks.

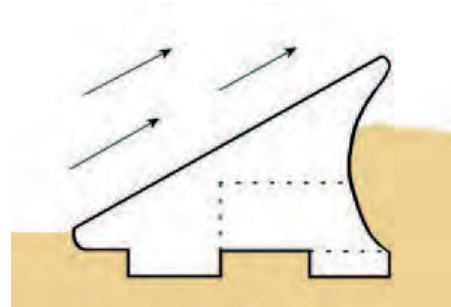


Figure 21: Lateral view of breakwater. Sand transported by wave action will be deposited on the beach side.

These breakwaters would protect the beaches and the intertidal zone from the effects of the strong levanter waves and currents. They would also create a shallow inshore area that would benefit biodiversity, in particular fish and molluscs.

Environmental impact assessments are required before the reclamation projects can advance. They should likewise have been carried out before the accumulation of material for the reclamation project.

15. MARL

Marl is a crumbly composite of clays, calcium and magnesium carbonates, and remnants of shells. In the sea this benthic habitat forms a hard but muddy bed over intrusions of the shales and mudstones forming the sea bottom. This is found inshore at only one location: 150m northwest of the North Mole. It is more common below the 100m mark in the middle of the Bay of Gibraltar and just beyond the three mile limit to the east of Gibraltar, again at depths of more than 100m.

15.1 Current Status

Status unknown although the area off the North Mole is commonly used as an anchorage for shipping. It is also a particularly good area for sports fishing, where in particular Bronze bream *Pagellus acarne*, Mackerel *Trachurus spp.* and Sardine *Sardina pilchardus* shoals congregate in the summer and autumn months (*pers. obs.*).

The other known location of this benthic type to the east of the Rock is just outside the limits of Gibraltar territorial waters and in waters too deep for ships to anchor.

15.2 Current Factors affecting Habitat

The continual anchorage of shipping at the North Mole site would have serious consequences for any animal life on the sea bottom.

The dredging of the sea bottom close to the site during 2003 and 2004 for aggregate to provide fill for an extension of existing sporting facilities is likely to have had an impact on this habitat.

15.3 Current Action

There are insufficient data on the composition of the wildlife of this benthic type. Further research is required to assess the status of this and other marine habitats before a practical habitat action plan can be implemented.

15.4 Conservation Direction

All the marine and benthic habitat types and sites require further research and investigation to assess their present status, existing and potential threats fully, and to establish a comprehensive species list for each habitat. Once this has been achieved then a practical Biodiversity Action Plan of the entire marine ecosystem may be prepared.

16. ROCK

Offshore benthic rock habitat is found in deeper waters beyond the benthic sand habitat. Rock is encountered to the west in the Gibraltar Bay beyond the 100m mark and on the eastern side at a depth between 50-80m at a distance of 2.5-3km. The eastside site, known colloquially as the 'three mile reef' has been used as a designated anchorage for shipping for over thirty years.

The area off Europa Point beyond Europa Reef is a favourite fishing ground, and a particular site known as 'Los Picos' is a rocky peak 1km out that rises to 20m depth and is exposed to the strong currents in the Strait.

Other offshore benthic rock bottoms are found beyond the 100m mark where they again give way to sand.

These two sites off Europa Point were very rich in marine fish species and the European Federation of Sea Anglers (EFSA) held their championships there in 1969.

16.1 Current Status

The benthic rocky bottoms on the east side are fairly degraded due to excessive commercial fishing and damage by ship anchors. This has reduced the fish catches at Catalan Bay (C. Riddell *pers. comm.*).

Rock habitat within the Bay is also quite degraded and is ignored by sport and commercial Spanish fishing vessels.

The marine area between the south side of Sandy Bay, around Europa Point and north to the southern end of the South Mole, extending out to three miles of territorial waters and at a mid point in the Bay of Gibraltar, has been proposed as a candidate Special Area of Conservation (cSAC) under the Habitats Directive 92/43 EEC (See fig. 15).

16.2 Current Factors affecting Habitat

The recession in shipping from the 1980s onwards has seen usage at the eastside anchorage at an unprecedented level, as laid-up ships remain for long periods.

The rock habitat off Europa Point has been overfished by Spanish commercial fishing vessels using multiple hook longlines (in excess of 300 hooks per line), illegal drift and seine nets and illegal spear-fishing with breathing apparatus. More fish will eventually recolonise the rocks but numbers will not recover unless over-exploitation ceases.

16.3 Current Action

None.

16.4 Conservation Direction

As with other marine habitats tackled, it is imperative that the relevant Laws of Gibraltar are enforced if we are to see an improvement and a restoration of the biodiversity in those areas. Amongst the priorities are:

- Eradication of all commercial fishing in the designated Marine Special Area of Conservation.
- Enforcement of laws on seine and gill nets in Gibraltar Territorial waters.
- Enforcement of laws on underwater fishing with breathing apparatus.
- Establishment of guidelines, regulation and control on sport fishing, spear fishing, and scuba diving activities in Gibraltar.
- Implementation of a wardening system to oversee the control of the latter.

Other regulations that will be of benefit to the Marine environment and require enforcement can be found within the Marine Nature Reserve Regulations (L/N 143 of 1995).



5. Species Action Plans

Gibraltar Neanderthals

5. Species Action Plans

Species Action Plans have been prepared for the species listed in Table 1. These have been selected mainly through their negative conservation status in Gibraltar, and also because there are clear steps that can be taken to protect them and enhance their survival. The list is not exhaustive; that is, non-inclusion here does not indicate that the species is secure in Gibraltar, nor that no action is needed. Further Species Action Plans will be prepared, and existing ones reviewed, in the future, in response to changing circumstances.

Action Plans specifically referring to re-introductions and translocation are not included and will form part of a future publication.

Table 1. Species for which Action Plans have been prepared.

Birds	
Western Mediterranean Shag	<i>Phalacrocorax aristotelis ssp. desmarestii</i>
Lesser Kestrel	<i>Falco naumanni</i>
Peregrine	<i>Falco peregrinus</i>
Barbary Partridge	<i>Alectoris barbara</i>
Eagle Owl	<i>Bubo bubo</i>
Mammals	
All Cetaceans	
Barbary Macaque	<i>Macaca sylvanus</i>
Red Fox	<i>Vulpes vulpes silacea</i>
European Rabbit	<i>Oryctolagus cuniculus</i>
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>
Schreiber's Bat	<i>Miniopterus schreibersii</i>
Flowering Plants	
All Orchids	
Gibraltar Chickweed	<i>Cerastium gibraltarium</i>
Gibraltar Campion	<i>Silene tomentosa</i>
Gibraltar Thyme	<i>Thymus wildenowii</i>
Gibraltar Restharrow	<i>Ononis natrix ssp. ramosissima var. ramosissima</i>
Gibraltar Sea Lavender	<i>Limonium emarginatum</i>
Gibraltar Candytuft	<i>Iberis gibraltaria</i>
Gibraltar Saxifrage	<i>Saxifraga globulifera var. gibraltaria</i>
Bay Tree	<i>Laurus nobilis</i>
Narrow-leaved Ash	<i>Fraxinus angustifolia</i>
Invertebrates	
Insects	
Gibraltar Joint-pine Beetle	<i>Buprestis sanguinea ssp. calpetana</i>
Arachnids	
Gibraltar Funnel-web Spider	<i>Macrothele calpeiana</i>
Terrestrial Molluscs	
A snail	<i>Acicula norrisi</i>
A snail	<i>Osteophora calpeana</i>
Marine Mollusc	
Mediterranean Ribbed Limpet	<i>Patella ferruginea</i>

*Birds:*Class: **Aves**Order: **Pelecaniformes**Family: **Phalacrocoracidae****MEDITERRANEAN SHAG**
Phalacrocorax aristotelis ssp. desmarestii

Figure 1: Mediterranean Shag *Phalacrocorax aristotelis desmarestii* (Y. Benting)

General Description

This subspecies seems to be double brooded in Gibraltar with nesting taking place in late January and February (sometimes even late December) and again in late May and June, when after both periods juvenile birds are frequently seen. The female lays a clutch of 1–6 eggs, although usually 3, nesting on sheltered cliff ledges often just inside small caves (Snow & Perrins, 1998).

The nominate species is afforded a favourable status in Europe by Birdlife International (2004). Nevertheless the subspecies *desmarestii* has a restricted global distribution and is therefore included in Annex I of the EU Wild Birds Directive, Appendix III of the Bern Convention, and included in the Emerald Network that aims to establish a network of 'areas of special conservation interest'. It also has species action plans under the ORNIS Committee of the European Union and the Standing Committee of the Bern Convention.

Global Distribution

The nominate subspecies is widely distributed throughout Europe, Asia and Africa but the sub-species *desmarestii*, slightly smaller than the nominate race, and whose juveniles are whiter below, is restricted mainly to the eastern Mediterranean with small populations in the central, western (including the Balearics) and southern sectors.

Local Distribution

The only recorded breeding site of the Mediterranean subspecies of Shag on the Iberian Peninsula is Gibraltar. These birds are largely sedentary, so that while the possibility of movements between western Mediterranean populations does exist, there is nevertheless a possibility of at least slight genetic differences between them.

The Shag nests on ledges and on the walls of sea caves located north and south of Governor's beach,

on the east side of the Rock. The population is estimated to be 5–10 pairs but the inaccessibility of the site and the irregular movements of the species make it impossible to determine precisely. The foraging area extends from well beyond La Atunara (La Linea, Cádiz) on the Mediterranean side to the northern end of the Bay of Gibraltar on the west side.

POPULATION TREND: Decreased significantly in the second half of the 20th Century. Now apparently stable.

Threat

The Shag is a resilient species that survived the intense disturbance of fast launches, day and night, during the late 1980's and 1990s. Nevertheless the species' breeding success during this period was probably compromised, as there is evidence of an increase in the population after this period when flocks of up to a dozen birds were regularly seen (SGB0 records). The advent of the noisy jet skis, with their ability to manoeuvre close inshore is probably the biggest threat to its breeding site. Disturbance at the site by fishing boats and divers during the breeding season is also a cause of concern.

Furthermore, the area adjacent to the nest site, Governor's Beach, is frequently used by the MoD to carry out live firing of guns and controlled pyrotechnic explosions, both land based and just offshore.

The Clay Pigeon Shooting Club has their site in an abandoned state just south of the main nesting area. The location was once regularly used, utilising lead shot that was fired seawards. The possibility of contamination to fish and to the marine life in the area, which are part of the food chain of the Shag and other species of marine wildlife, is worrying. Spent cartridges are also disposed into the sea and cliff area, contaminating the foraging areas.

The possibility of an oil spill in the area of the Strait of Gibraltar is considerable. Maritime traffic in the Straits is immense and the waters to the east of the Rock are an official anchorage for large ships and other vessels. Accidents do occur (although infrequently), but indiscriminate emptying of the ships' bilges by unscrupulous captains has produced smaller spills on an annual basis. The Bay of Gibraltar has become an official bunkering zone, and occasionally accidental spillage of fuel oil does occur. This, and the location of an Oil Refinery at the head of the Bay, places this zone in serious danger of occasional oil and fuel spills, and constitutes the largest threat to the survival of this species in the area of Gibraltar.

The feeding area at the northern end of the Bay off the North Mole now sees more maritime traffic than ever before and this disturbance is worrying. Notwithstanding this there have been improvements to their feeding grounds off the eastern side where an enterprising Spanish company has set up a mussel rearing venture with several rafts located a mile offshore. This forms a barrier to motor vessels and unwittingly provides a resting place and foraging habitat for this species.

The possibility of Shags becoming trapped in tuna fishing nets ceased once the La Linea *Almadraba* stopped operating in the 1990s. However, Spanish net fishermen frequently use seine and drift nets within the Shags' feeding grounds, sometimes even within the cove which includes Governor's beach. This remains another danger to the species.

The population is so small that the loss of very small numbers could have a catastrophic effect and threaten its survival.

Action

The nesting site of the West Mediterranean Shag needs strict protection. The nomination of a substantial marine area, which includes the waters around this site, as a candidate Special Area of Conservation cSAC, will greatly benefit the survival of this species in Gibraltar. If measures are to be taken to ensure the protection of the species, we must be able to monitor, survey and study this species with a view of improving and possibly augmenting its nesting possibilities by incorporating artificial nest ledges within the cave. A reduction of the Yellow-legged Gull population and human disturbance in the area would possibly allow the expansion of the species to colonise cliff ledges around the site.

Specific action should also include:

- Enforcement of nature conservation laws in respect of net fishing in territorial waters and more specifically within the areas adjacent to the species' nesting site.
- Improvement of monitoring of port activities involving fuels.

Class: **Aves**Order: **Falconiformes**Family: **Falconidae**

LESSER KESTREL
Falco naumanni



Figure 2: Lesser Kestrel *Falco naumanni*. (P. Acolina).

General Description

The Lesser Kestrel is a small falcon that breeds in colonies in holes in cliffs and buildings. In Gibraltar it is restricted to a small colony on the North Face of the Rock. Most individuals winter south of the Sahara and return to their breeding grounds in February and March. The female incubates between four to six eggs and the chicks are fed mainly on invertebrates and small reptiles that are caught in its favoured foraging grounds; open habitats.

The Lesser Kestrel is a globally threatened species listed as Vulnerable by Collar *et al.* (1994). It is included in Annex I of the EU Wild Birds Directive, Appendix II of the Bern Convention, Appendix II of the Bonn Convention, Appendix II of CITES and Annex B of the African Convention on the Conservation of Nature and Natural Resources (Biber, 1990). Locally it is protected under the Nature Protection Ordinance (L/N 11 of 1991), and its breeding colony falls within the boundary of the Upper Rock Nature Reserve, a cSAC.

Global Distribution

This species has a Palearctic breeding distribution south of 55°N and mainly winters south of the Sahara, although some remain in the Mediterranean region (including near Gibraltar) and there are winter records for Gibraltar up to the 1960s.

Local Distribution

This falcon is restricted as a breeding species to a small colony found on the north face cliffs from below Princess Caroline's Battery eastwards. The colony held fourteen breeding pairs in 2005.

POPULATION TREND: Decreasing. It is monitored every year by GONHS.

Threats

The main cause of decline of the Lesser Kestrel is habitat loss and degradation as a result of agricultural intensification, afforestation and urbanisation. The indiscriminate use of pesticides, including in its main wintering grounds has also led to a serious decline in the population of the species, with the numbers of breeding pairs dropping by 95% globally since the 1950s.

In Gibraltar we have also seen a dramatic decrease in the numbers of breeding pairs at the colony, due to similar reasons (Bensusan & Cortes, in press). The main threat to the Gibraltar colony is urbanisation and the loss of feeding habitats due mainly to the construction of the airfield and the extension of the town of La Linea to the north, resulting in the loss of historical feeding habitats. The birds have to make a round trip of approximately 4 km to bring food back to their chicks. The foraging habitat on the Upper Rock is unsuitable for these birds that require pastures and agricultural land.

There is also direct competition for nest sites from Feral Pigeons which have been seen to displace them from nest holes.

Action

Gibraltar authorities can do little about those threats that affect this species which are situated within Spain. However, they can ensure that all protection and conservation measures that are applicable to Gibraltar are enforced and adhered to.

Areas of habitat in the isthmus, specifically the aerial farm and the area at the base of the North Face (see Chapter 4) should be protected and restored to provide some feeding opportunities. Management of the vegetation of the newly restored habitat on the Great Sand Slopes could also increase the foraging sites available within Gibraltarian territory. Following this, and as Lesser Kestrels have been bred and reared by the GONHS Raptor Rehabilitation Unit, it may be possible to supplement the colony at North Front with new individuals. Another possibility would be the establishment of a colony, using birds reared by GONHS, on the cliffs of the east side of the Rock or on Windmill Hill. These aspects will be considered in more detail in a separate study (Perez, in prep.)

Class: **Aves**

Order: **Falconiformes**

Family: **Falconidae**

PEREGRINE FALCON *Falco peregrinus brookei*



Figure 3: Peregrine Falcon *Falco peregrinus* (F. Barrios)

General Description

In Gibraltar the Peregrine is of the Mediterranean subspecies *brookei*, which is slightly smaller than the nominate race. It nests on cliff ledges. The female lays a clutch of 3–4, sometimes 5 eggs in late March and April, which hatch after an incubation period of approximately 30 days. The young leave the nest a month later and soon disperse to colonise other areas.

The nominate species is afforded a favourable 'secure' status in Europe by Birdlife International (2004), that had been previously classified it as 'rare'. Nevertheless the species is included in Annex I of the EU Wild Birds Directive, Appendix III of the Bern Convention, and included in the Emerald Network that aims to establish a network of 'areas of special conservation interest'.

Global Distribution

The Peregrine has an almost worldwide distribution, being found on every continent except Antarctica.

Local Distribution

The Peregrine is widely distributed throughout Gibraltar, with up to seven pairs nesting in 2005. The nests are distributed along the cliffs, from the North Face, East Side cliffs, Europa cliffs and Camp and Little Bay cliffs. This is an unprecedented concentration of breeding birds, so that Gibraltar clearly contributes significantly to the Peregrine population of the region.

POPULATION TREND: Stable, with slight recent increase.

Threat

The Peregrine Falcon is highly coveted as a falconer's prize and as such has not escaped the unscrupulous eyes of certain individuals in Gibraltar in the past. One particular pair's nest was ransacked and the chicks taken on several occasions in the 1980s and 1990s. This practice seems to have stopped, but in 2003 a rope was reported dangling down close to the nest site and the police were called in to investigate.

The disturbance to nests and temporary or permanent loss of nest sites as a result of cliff stabilisation works is a concern.

A potential threat to this species is the use of poison to control the growing population of feral pigeons, a practice that has been suggested in the local press. This would be unreasonable, as the possibility of the poisoned pigeons passing into the food chain of other wildlife, including the Peregrine is wholly unacceptable.

Action

The Environmental Agency and other pest control bodies on the in Gibraltar must only use measures in controlling pest species that do not involve the use of poisons or other agents that may be detrimental to the survival of other species of wildlife.

Construction projects should not be sited at the base of cliffs. Any works to cliffs must ensure that they are both carried out outside the nesting season and that they do not destroy or block access to actual or potential Peregrine nest sites.

Continual monitoring and research, and a vigilance of all sites during the breeding season, particularly those within easy reach should be maintained annually, together with breeding surveys of this species to assess their reproductive success. This is currently undertaken by GONHS.

Class: **Aves**Order: **Galliformes**Family: **Phasianidae**

BARBARY PARTRIDGE
Alectoris barbara



Figure 4: Barbary Partridge *Alectoris barbara* (E. Shaw)

General Description

A shy species feeding on shoots, fruiting shrubs, seeds and invertebrates. The female lays 10–14 eggs in a shallow scrape on the ground between March and May. The chicks hatch in late May and June in Gibraltar and are capable of taking short flights at 7–10 days. In the winter they form coveys of up to eight birds.

Global Distribution

Found only in the western Palaearctic, almost entirely within the north-western African countries of Morocco, Algeria, Tunisia and Libya, and in the Canary Islands. In mainland Europe it is found only in Gibraltar. A small population of the species is also established on the island of Sardinia, where it is presumed the species was introduced in the mid-18th century (Snow & Perrins, 1998).

Local Distribution

The bird is located mainly on open areas in the Upper Rock Nature Reserve, the Lower Slopes and the Talus Slope with its main stronghold on Windmill Hill Flats. It has recently been seen on the Great Sand Slopes, a restored habitat that will greatly improve the expansion and conservation of this species.

POPULATION TREND: Unknown although probably stable.

Threat

Several factors are affecting the conservation of the species. Amongst the most important of these is habitat loss within the Upper Rock Nature Reserve. Open ground, the bird's preferred habitat, has been diminishing at a rapid rate with the loss of important firebreaks that provided the birds with foraging and breeding grounds. The loss of the Bruce's Farm firebreak and the open ground within the MoD aerial farms on the Upper Rock, encroaching vegetation on existing firebreaks and the loss of open habitat on Rock Gun and the adjacent Lower Slopes are the main factors that are affecting the population of this species.

It is difficult to assess the status of the Barbary Partridge in such dense habitat, but there seems to have been a decline in the population of the species on the Upper Rock in the last decade (*pers. obs.*). Another contributing factor to this decline must surely be the rising population of feral cats on the Upper Rock and in other areas around Gibraltar. Tourist sites at St. Michael's cave, the Cable Car top station and the Upper Galleries have resident populations of feral cats that are encouraged by food handouts by tour operators, site employees and others. Young flightless partridge chicks are easy prey for these predators. Predation by Yellow-legged Gulls has also been observed.

The presence of chicken coops on the Upper Rock is also worrying. Chickens will compete with par-

tridges for food. Moreover, when these animals are allowed to wander freely they may come into contact with the partridges that may contract undesired avian pathogens from these known carriers of disease.

Action

The Barbary Partridge's very restricted distribution in Europe has resulted in the choice of this species as a flagship bird species for Gibraltar and as the GONHS emblem. It is therefore imperative that the welfare and survival of this species in Gibraltar is secure.

The implementation of the environmental management plan and recommendations as set out in the 'Upper Rock Nature Reserve, A Management & Action Plan' (Perez & Bensusan, 2005), to effectively tackle habitat succession, and an effective firebreak policy with regular maintenance would go a long way towards improving the status of the Partridge.

A cat-culling programme must be established for the Upper Rock Nature Reserve and in other areas of Gibraltar where the Barbary Partridge and other wildlife are at risk.

A research and monitoring programme should be implemented, in order to assess the status of the species and gauge the success of the environmental management and cat control programmes in relation to the recovery and conservation of the Barbary Partridge.

This species should be included in public awareness campaigns as the flagship bird species of Gibraltar.

Class: **Aves**

Order: **Strigiformes**

Family: **Strigidae**

EURASIAN EAGLE OWL *Bubo bubo*



Figure 5: The Eurasian Eagle Owl *Bubo bubo*. (E. Shaw)

General Description

The Eurasian Eagle Owl is the world's largest owl with a wingspan of 150–200cm. The owl breeds between February and July with the female laying a clutch of 1–3 eggs. Generally nocturnal in its habits, it feeds on a wide variety of prey items including medium-sized mammals, such as rabbits, and birds. In Gibraltar they have been feeding successfully on Yellow-legged Gulls. The local pair raised the maximum three young in what appeared to be their initial breeding attempt in 2005.

The Eagle Owl is protected under the Nature Protection Ordinance (L/N 11 of 1991), and is a species of European conservation concern that is afforded SPEC 3 category by Birdlife International (2004). It is an Appendix III species under the Bern Convention, requiring the Contracting Party to take appropriate and necessary legislative and administrative measures to ensure its protection. It is also listed under Annex I of the Birds Directive 79/409/EEC, which requires that Special Protection Areas (SPAs) be designated for the species. The Upper Rock Nature Reserve and the owls' feeding sites on the East side have been proposed as candidate SACs under the Habitats Directive.

Global Distribution

The Eagle owl is widely distributed throughout Europe, Russia, Asia and the Middle East. The European breeding population is relatively small, having undergone a severe decline during the 1970-1990. It has since recovered, although numbers are still below 1970 figures (Birdlife International 2004).

Local Distribution

Extinct as a breeding species in Gibraltar since the 1920s (Garcia 2006), a pair was discovered breeding in the spring of 2005, and might have been present previously, since the nocturnal habits of this owl and its shy behaviour make it difficult to locate. The birds nest in small caves on the east cliffs above Catalan Bay, and forage widely along the Great Sand Slopes and the Talus slope, as was seen by the widely scattered remains of Yellow-legged Gull chicks present (*pers. obs.*).

Threat

The proposed development of a funicular railway in the area above the nest site, just after it had recolonised Gibraltar would have resulted in its extinction again. Thankfully the proposal was rejected by the Development & Planning Commission after a lengthy campaign.

The use of poison to control rats around the tourist sites located on the Upper Rock is potentially fatal for the Eagle Owls and other birds of prey that may consume these animals.

Action

The Environmental Agency must be instructed to refrain from using poison indiscriminately in Gibraltar. There are non-toxic agents and trapping methods that will eradicate rat infestation that will not affect wildlife. These should preferably be used.

Careful monitoring of this pair is required and the establishment of the proposed Biological Reserve (Perez & Bensusan, 2005), within the confines of the Rock Gun/Middle Hill area, that will restrict unescorted access to the general public, would ensure minimal disturbance to the breeding site of this species, which may lead to the establishment of further pairs on the Rock.

Mammals

Class: **Mammalia**

Order: **Cetacea**

Family: **All**

ALL CETACEANS



Figure 6: Common Dolphins *Delphinus delphis*. (E. Shaw)

General Description

Locally, there are breeding nurseries of both Striped Dolphins *Stenella coeruleoalba* and Common Dolphins *Delphinus delphis* within the Bay of Gibraltar (Shaw 1998). They feed on cephalopods, crustaceans and bony fish. The mating season is in autumn, with a gestation of between 12-13 months, a nursing period of 16 months and a four-year calving interval, (MarineBio.org).

Global Distribution

Most of the cetacean species encountered in and around Gibraltar and its waters are those of warm-temperate and tropical seas throughout the world including the Mediterranean Sea, Pacific Ocean, Atlantic Ocean, Indian Ocean, Caribbean Sea, and the northern Gulf of Mexico.

Local Distribution

Local Dolphin populations are found at the head and the central part of the Bay of Gibraltar, with large numbers of local and migrant schools frequently encountered in the Strait and the eastern side. Whales often enter the Bay but are most often seen in the Strait of Gibraltar and the waters on the eastern side of the Rock. These include Fin Whales *Balaenoptera physalus*, Minke Whales *Balaenoptera acutorostrata* and Sperm Whales *Physeter macrocephalus*, of which there is a small resident population in the Strait.

POPULATION TREND: Unknown, although all local species are considered vulnerable.

Table 2: List of cetacean species encountered in Gibraltar waters.

DELPHINIDAE	
Common Dolphin	<i>Delphinus delphis</i>
Long-finned Pilot Whale	<i>Globicephala melas (melaena)</i>
Risso's Dolphin	<i>Grampus griseus</i>
Orca or Killer Whale	<i>Orcinus orca</i>
Striped Dolphin	<i>Stenella coeruleoalba</i>
Bottle-nosed Dolphin	<i>Tursiops truncatus</i>
PHYSETERIDAE	
Sperm Whale	<i>Physeter macrocephalus</i>
ZIPHIDAE	
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>
BALAENIDAE	
Northern Hemisphere Minke Whale	<i>Balaenoptera acutorostrata</i>
Fin Whale	<i>Balaenoptera physalus</i>
Humpback Whale	<i>Megaptera novaeangliae</i>

Threat

The main threats are as follows:

- Disturbance from increased shipping activity, including dolphins spotters
- Habitat loss and degradation
- Contamination and pollution
- By-catch in fisheries

The main threat to the populations of dolphins found inside the Bay of Gibraltar is the increased shipping activity and bunkering, allowing for fewer areas where the dolphins can roam in peace.

This peace is further threatened by the uncontrolled activity of up to five dolphin tour operators based in Gibraltar and La Linea, some of which frequently disturb the dolphin pods. Add to this the increased potential of oil spillage and pollution in the Bay and the welfare and survival of the dolphin species in the Bay is greatly compromised.

Habitat loss may become a problem with the increasing amount of reclamation in the Bay, outside harbour areas, particularly in relation to the ports of Algeciras and La Linea. Similarly industrial and commercial activities around the Bay are a constant source of pollution, with oil-related activity in particular risking a major oil spill.

Although the use of drift nets has been outlawed in the Mediterranean, the species are occasionally caught in drift and seine nets, when they are quickly despatched by fishermen. They are also sometimes caught within the tuna traps that are located at the entrance to the Strait. Dead dolphins with cut fins and tails are sometimes washed up on our beaches. Whale casualties as a result of the collision with ships and their propellers occasionally turn up in the Bay of Gibraltar and on the shores of the Rock.

The use of nets is also forbidden under the Nature Protection Ordinance, but despite this a local agreement with fishermen from La Linea and Algeciras allows a maximum number of four boats at any one time to fish with certain nets (those in keeping with European law) no closer than 350m from the shore. This arrangement is often abused and nets over 1 km long can be seen off-shore, while seine nets are used inshore, in areas such as Rosia and Little Bay and Governor's Beach. These practices are not possible in nearby Spanish waters because of the increased shipping on their side of the Bay and because their coastline was declared a marine Nature Reserve in 2003 within the Parque Natural del Estrecho as part of the Red de Espacios Naturales Protegidos de Andalucía.

Action

There is no easy solution to the increase in shipping activity taking place in the Bay of Gibraltar. Nevertheless the foraging and breeding areas of these dolphins should be identified and the Port authorities in Gibraltar and Algeciras notified, so that exclusion zones can be declared or at least they can keep disturbance in these areas to an absolute minimum.

The activities of the Dolphin tour operators must be controlled with a strict code of conduct. The Dolphins must be allowed to approach the boats as they please and not vice versa. Speed of the vessels must remain to an absolute minimum and harassment of the animals must not be allowed, with minimum distances and mobile exclusion zones around groups of dolphins and time intervals between which the same group may not be approached. A draft protocol covering all these aspects was prepared by GONHS and presented to the Port Authorities in 1999 but no progress has been made (Shaw 1998).

The Port authorities must ensure adequate standards to avoid the possibility of potential oil and fuel spillage and contamination and pollution of our waters.

The laws prohibiting the use of nets within Gibraltar waters must be enforced

Class: **Mammalia**Order: **Primates**Family: **Cercopithecidae****BARBARY MACAQUE**
Macaca sylvanusFigure 7: Barbary Macaques *Macaca sylvanus*. (J. Martinez)**General Description**

The Barbary Macaque belongs to the old world monkeys, and is mistakenly referred to as Barbary or Rock "Ape". Although it lacks a tail, it is a true monkey. The males are large, reaching over a metre in length, with strong features including long canine teeth and powerful jaws. Females are slightly smaller and less muscular. Mating occurs during the late autumn and winter with young born in late spring and summer after a gestation period of about five months. These are social animals that usually live in groups of 10-40 individuals and feed on a variety of plant shoots, fruit and roots and small invertebrates.

Global Distribution

Once found extensively along montane forests in Algeria, Morocco and Tunisia, the species has declined dramatically with only 23% of the global population found in small colonies in Algeria and the remainder mainly in the Middle Atlas of Morocco and smaller populations in the Rif Mountains and High Atlas (Oates, 1997), with a total global population of no more than 10,000 (Mouna & Ciani, 2006). Also found in the wild in Gibraltar where they were most probably introduced in historical times (Shaw & Cortes, 2006), and where the species is doing well.

Local Distribution

The population of Barbary Macaques in Gibraltar was 248 individuals in January 2006. They are mainly distributed in six groups within the Upper Rock Nature Reserve, although some foraging occurs outside the boundaries of the Reserve.

POPULATION TREND: Increasing in Gibraltar. Decreasing elsewhere.



- Apes Den
- Middle Hill
- Anglian Way
- Faringdon Battery
- Prince Phillips Arch
- Lathbury Barracks
- Observations outside normal range

Figure 8: Home range of the Barbary Macaques 2004 (Perez & Bensusan 2005, Shaw & Cortes, 2006).

Threat

The Barbary Macaque is the flagship mammal species of Gibraltar and the main tourist attraction within the Upper Rock Nature Reserve, and is under no threat. In fact the species has increased its population from 33 individuals in two groups in 1970 (when most culling by the Military stopped), to the present 240 in six groups.

This species is classified as vulnerable by the World Conservation Union in the IUCN Red Data List 2002, and listed under Appendix II of CITES. Wild populations in North Africa are shrinking rapidly due to habitat loss, overgrazing and human disturbance. Nevertheless the local population of the Macaques is doing so well that Macaques have reached pest proportions. Some groups are now foraging in residential areas while others are pilfering the refuse dumps.

The Barbary Macaque is both a globally endangered species that needs protection and a pest species that has an adverse effect on local biodiversity. The species causes extensive erosion to cliff faces and slopes and uproots numerous plant species in its foraging sprees. This is happening in particular sensitive areas of Rock Gun and Middle Hill, the area around Prince Phillip's Arch, Anglian Way and O'Hara's Battery, where many rare species of plants have disappeared and others are under threat from the constant foraging of these animals.

A clear example of the damage done can be seen at the Ape's Den, where the cliff area is devoid of any vegetation and even the olive trees that grow in the area have suffered from the constant swinging and branch-bending displays of the males.

Action

The ongoing population explosion has reached unsustainable levels in Gibraltar. They have also extended their range to include areas where interaction with the human population has been inevitable, and has already resulted in numerous public complaints. They regularly ransack open rubbish bins in the Calpe area and are also fed illegally by the residents in the area (*pers. obs.*).

Implementation of the recommendations and the effective control and management of the Barbary Macaques as stipulated in the report 'Upper Rock Nature Reserve, A Management and Action Plan' (Perez & Bensusan, 2005), which summarises past consultation and representations by GONHS, is a priority. This would include the removal of excess groups, through exportation wherever possible or through a culling programme to limit the numbers within the Nature Reserve to a manageable number, and should exclude a group that is free from human interaction.

Macaque proof bins should be incorporated in residential areas and illegal-feeding laws should be enforced, both within the Nature Reserve and in other areas where macaques frequently roam.

Informal proposals for a new macaque site at Tovey Battery are unwise, as this particular location will bring a new group within a few hundred metres of the already problematic Calpe area of the upper town, and exacerbate an ongoing problem. It is better to maintain those sites that are already occupied by macaque groups that lie well away from human habitation.

The establishment of new groups to accommodate the tourist industry is unreasonable, placing excessive pressure on existing groups and creating further environmental damage through the foraging exploits of the animals. Facilities at established Macaque tourist points should be expanded instead of creating new sites.

Further reading

- **Hodges, J.K & Cortes, J. (eds) (2006)** *The Barbary Macaque, Biology, Management and Conservation*. Nottingham University Press. Nottingham.
- **Oates, J.F. (1996)** *African Primates: Status Survey and Conservation Action Plan*. IUCN, Gland, Switzerland.
- **Perez, C. E. & Bensusan, K. E. (2005)** Upper Rock Nature Reserve. A Management and Action Plan. *Barbary Macaques*, pp165-174. The Gibraltar Ornithological & Natural History Society. Gibraltar.

Class: **Mammalia**Order: **Carnivora**Family: **Canidae**

RED FOX
Vulpes vulpes silacea



Figure 9: Red Fox *Vulpes vulpes ssp. silacea* (E. Shaw)

General Description

This carnivore reaches sexual maturity in its first year, with breeding taking place in January and February. The cubs are born after a gestation period of approximately 52 days, with a litter of between one and seven individuals. Red Foxes are generalists that inhabit a great variety of habitats and adapt well to human presence.

Global Distribution

Distributed throughout the northern hemisphere reaching the Arctic Circle, the Red Fox is the most widespread of all carnivores. It is widely distributed throughout the Iberian Peninsula and North Africa.

Local Distribution

By the early 1980s the Red Fox became extinct locally, but GONHS developed a reintroduction programme, as part of the Yellow-legged Gull control programme. A captive breeding programme, using foxes from Spain, commenced in 1995 but was unsuccessful. In 2003 the animals were released on the Rock with another fox released in early 2005. At present the species is present in the southern area of the Upper Rock Nature Reserve, Windmill Hill and the Europa area.

Threat

Rodenticide is sometimes used by the Environmental Agency on the Upper Rock Nature Reserve, especially within St. Michael's Cave and the Great Siege Tunnels. This poses a serious threat to the survival of species that consume rats as part of their diet. Similarly residents on the Upper Rock may be using this form of rodent control, posing a serious threat to the Fox.

Action

As the captive breeding programme proved unsuccessful, a reintroduction programme should continue using available animals from Spain that would be released in the wild, after health checks and vaccinations. Apart from increasing our biodiversity, the animal is well suited to the habitats on the Upper Rock and peripheral areas where it would benefit from and have a great impact on the current Yellow-legged Gull population. A total ban on the use of rodenticide by the Environmental Agency and local residents must be applied if species such as the Fox, Eagle Owl and Raven are to survive within the Nature Reserve. The use of environmentally friendly methods of controlling rodent populations, such as trapping and non-toxic lethal baits should be encouraged.

Class: **Mammalia**Order: **Lagomorpha**Family: **Leporidae**

EUROPEAN RABBIT
Oryctolagus cuniculus



Figure 10: The European Rabbit *Oryctolagus cuniculus*. (E. Shaw)

General Description

The Rabbit is a species that can breed throughout the year. The reproductive cycle is therefore dependent on an abundant supply of quality food linked to favourable wet climatic cycles. These periods range from November through to early June, when after a period of approximately 20-30 days the Rabbit will give birth to between three and six individuals, and may breed again up to four times within the same year.

Global Distribution

Originally native to Iberia and the western Mediterranean, the European Rabbit has now been introduced to many parts of the world.

Local Distribution

Rabbits are distributed mainly on the Upper Rock and Windmill Hill flats. Although they seem more common on Windmill Hill, this may be due to the more open nature of the vegetation at this site.

POPULATION TREND: Decreasing.

Threats

Although a detailed survey of the status of Rabbit populations in Gibraltar has not been carried out, it is evident to local naturalists based on casual encounters that the population of Rabbits on the Upper Rock has become depleted. This is probably due to a combination of factors. The increasingly tall and dense nature of much of the vegetation of the Upper Rock clearly does not suit this species' ecology. In addition the number of feral cats on the Upper Rock has seen a dramatic increase in recent years (Perez & Bensusan 2005). Cats are known to prey on Rabbits (Bayly, 1975), and these could have a serious effect on a population that is already suffering as a result of habitat loss.

Rabbits on Windmill Hill are frequently encountered and are not uncommon. However, this population is small given the size of the area. Increased isolation poses a serious threat to what seems to be Gibraltar's most healthy Rabbit population. In this sense the development of the Lathbury area has the potential to jeopardise the most important population of the species on the Rock, in effect isolating the population further. Feral cats are also a problem on Windmill Hill.

Pet Rabbits have been released in some areas of Gibraltar, including Windmill Hill, the Upper Rock and recently on the Europa Foreshore. These have the potential to interbreed with our wild stock, contaminating the local gene pool.

Rabbits are known to do better in wet years (Palomo & Gisbert 2000). Climate is known to be changing, with most of Europe becoming hotter and drier (EEA 2004). Climate models predict an increase in temperature and decrease in rainfall for Gibraltar and the Mediterranean (Sanchez *et al.* 2004). If correct, this will have a negative impact on the reproductive output of the Rabbit on the Rock.

Action

The removal of feral cats from the Nature Reserve and Windmill Hill would serve to improve the possibility of a population increase. Firebreak maintenance and clearing, and the introduction of a habitat management workforce as recommended by Perez & Bensusan (2005) would substantially benefit the preferred habitat of Rabbits. Feral domestic rabbits should be removed and the release discouraged by publicity as well as legal means, as it is in contravention of the Nature Protection Ordinance.

Further Reading

- **Anderson, I., (1995)** "Alien predators devastate Australian wildlife". *New Scientist*, Vol 145, No 1962.
- **Bayly, C. P., (1975)** "Food habits of the feral house cat in the Woomera area" (unpublished).

Class: **Mammalia**Order: **Chiroptera**Family: **Vespertilionidae**

SOPRANO PIPISTRELLE
Pipistrellus pygmaeus



Figure 11: Soprano Pipistrelle *Pipistrellus pygmaeus*.

General Description

Pipistrellus pygmaeus differs from the very similar *P. pipistrellus* primarily in vocalisations: the former calls at between 49.2–57.6 kHz and the latter between 41.6–50.8 kHz. The species is found in varied habitat types including urban areas, where it can be seen catching insects around street lights. *P. pygmaeus* shelters in rock fissures, trees, nest boxes, buildings and occasionally caves. Breeding takes place in the spring with the young born in late May and June. Females lactate until August by which time they leave the young to fend for themselves (Palomo & Gisbert 2000).

All Bat species are protected under the Nature Protection Ordinance (1991) and under the Bonn Convention in the Agreement on the Conservation of Populations of European Bats (EUROBATS).

Global Distribution

Mainly distributed in southern and central Europe.

Local Distribution

Poorly known, although observed primarily in the Alameda Gardens and the town area.
POPULATION TREND: Stable to decreasing.

Threats

The redesigning of roofs in the town area has had an impact on the Pipistrelle population, which frequently used the older, tiled roofs as roost sites.

Action

A public awareness and educational campaign on the status and predicament of Bat populations in Europe, and their contribution in eliminating insects, together with the promotion and erection of bat boxes in urban and suburban areas, would improve the concept that people have of these creatures. Planners and developers must be made aware of the potential presence of bats in buildings alter plans to avoid disturbance. New buildings should require provision for potential bat roosts.

Class: **Mammalia**Order: **Chiroptera**Family: **Miniopteridae**

SCHREIBER'S BAT
Miniopterus schreibersii



Figure 12: Schreiber's Bats *Miniopterus schreibersii*. (J.Cortes)

General Description

Breeding of the Schreiber's Bat takes place in the autumn and females can suspend gestation until after hibernation. The offspring are born at the end of June and July with only one young per female. After two to three months the offspring are ready to fly, and are capable of surviving up to 15 years.

Global Distribution

A subtropical species distributed throughout Europe, Africa, Asia and Australia. The taxon known until recently as *Miniopterus schreibersii* has undergone a revision, and the subspecies inhabiting many parts of Africa, Australia and Asia are now considered different species by some authors.

Local Distribution

The Schreiber's Bat was once the most numerous bat in Gibraltar. During the 1960s, this bat was widely distributed in many of the Rocks' larger caves and tunnels. Palao (1969) recorded over 7,800 individuals, with Martin's Cave holding the largest colony of 5,000. By the early 1980s approximately 500 were left and this colony disappeared shortly after. A small colony of between 20-40 individuals was rediscovered recently in a tunnel close to O'Hara's battery and is the only known group of the species in Gibraltar. There has been a ringing control of a Schreiber's Bat originally ringed in Benalmadena, Malaga, Spain, about 100km north-east of Gibraltar.

POPULATION TREND: Decreasing; considered locally endangered.

Threats

Disturbance to the bats' historical caves was thought to have been the main cause of the decline and subsequent extinction of the species on the Rock. Evidence of fires lit within the cave to disturb bats intentionally was found. The succession of much of the vegetation on the Upper Rock into high maquis has seriously affected this species ability to feed in open areas such as garigue, which it prefers. In 2001, 2002 and 2003 many bats of this species died throughout Iberia, apparently as a result of a viral disease, which was however not detected in Gibraltar.

The massive decline in the population of this species is difficult to attribute to these factors alone. The possibility of another agent affecting the species has to be considered. Indiscriminate use of pesticides in Spain and Morocco may be the cause, as there seems to have been a decline in insect populations on which animals depend.

Action

Similar action to the former bat species including the implementation of the Cave Management Plan proposed by Perez & Bensusan (2005), to ensure the protection and conservation of suitable breeding and roosting caves on the Rock. Management of the habitat of the Upper Rock to allow more open areas, as well as protection of existing open areas such as the Great Sand Slopes, Windmill Hill and associated areas are of vital importance.

Flowering Plants

Class: **Angiospermae**

Order: Orchidales Family: **Orchidaceae**

ALL ORCHIDS



Figure 13: Bumble-bee Orchid *Ophrys bombyliflora*. (L. Linares)

General Description

The orchids found in Gibraltar are perennial plants that grow from tuberous roots. They produce large numbers of minute seeds, which in order to germinate successfully, must land on favourable ground containing a fungus with which it will form a symbiotic relationship. The seeds are devoid of food reserves, and will obtain the necessary nutrients from the fungus until the first leaves are produced. Anything from two to fifteen years may elapse from germination to production of the first leaves. This will depend on the environmental conditions and on the species concerned.

Orchids grow best on open habitats where there is little or no overgrowth. At the same time they prefer humid ground conditions and are often found on soil and rocky outcrops where there are mosses and ferns. In Gibraltar these conditions are found in clearings and rocky outcrops within the maquis, on cleared firebreaks, and along footpaths and roadsides.

Global distribution

Orchids are found throughout the tropical and temperate regions of the world. The genera found in Gibraltar are typical of those found in temperate and northern regions of Europe, and in African and Asian countries bordering the Mediterranean.

Local distribution

The majority of orchids in Gibraltar are found in the area known as the Lower Slopes, which are located below the 200m contour and above the upper town. Here they can be found mainly on the north-facing slopes of the three gullies that cross the area from east to west. A few scattered plants can also be found on rocky outcrops and other open areas within these Lower Slopes. Elsewhere on the Upper Rock orchids can be found along footpaths and roadsides, and also on rocky outcrops and clearings.

POPULATION TREND: Local populations have been declining over the last twenty years or so. A small population of the Bumble Bee Orchid was only discovered in 2006 in the Convent Gardens, after an absence of over fifteen years and the Pyramidal Orchid, *Anacamptis pyramidalis* has not been seen since 1990.

Table 3: Orchid species that have been recorded in Gibraltar.

Orchids	
Pyramidal Orchid	<i>Anacamptis pyramidalis</i>
Two-leaved Gennaria	<i>Gennaria diphylla</i>
Bee Orchid	<i>Ophrys apifera ssp. apifera</i>
Bumble Bee Orchid	<i>Ophrys bombyliflora</i>
Brown Bee Orchid	<i>Ophrys fusca ssp. fusca</i>
Yellow Bee Orchid	<i>Ophrys lutea ssp. lutea</i>
Mirror Orchid	<i>Ophrys speculum</i>
Sawfly Orchid	<i>Ophrys tenthredinifera</i>
Small Tongue Orchid	<i>Serapias parviflora</i>
Autumn Lady's Tresses	<i>Spiranthis spiralis</i>

Threats

Orchids do not take kindly to disturbance, and as a result of repeated and indiscriminate clearing of roadsides along the Upper Rock practically all the orchids that used to grow along these cleared roadsides have been exterminated. Those growing on the Lower Slopes and along footpaths suffer from the effects of overgrowth and spread of the surrounding vegetation. The spread of invasive species such as Bermuda Buttercup *Oxalis pes-caprae* and Bear's Breeches, *Acanthus mollis* has also played a part in the decline.

Action

Roadsides and footpaths must be kept clear of overgrowth. This should involve the cutting back of overgrown shrubs, but not the removal of ground vegetation.

All firebreaks have to be cleared annually, and this should be done at the end of the main flowering season, once the plants have set seed. This includes the firebreak around Bruce's Farm, which has not been cleared for many years and is now seriously overgrown. Firebreak boundaries should be cut back to avoid encroachment.

A management programme should be drawn up for the Lower Slopes, so that the density of the encroaching maquis vegetation could be reduced. This would re-create the open areas that once existed there.

Invasive plant species should be removed.

Ex-situ conservation should be encouraged through cultivation in the Gibraltar Botanic Gardens. None are grown at present.

Class: **Angiospermae**Order: **Centrospermae**Family: **Caryophyllaceae****GIBRALTAR CHICKWEED**
Cerastium gibraltariumFigure 14: Gibraltar Chickweed *Cerastium gibraltarium*. (L. Linares).**General Description**

The Gibraltar Chickweed is a loosely tufted woody perennial that flowers between April and June. The species grows on cliffs and in rocky areas.

Global Distribution

Endemic to Gibraltar.

Local Distribution

The Gibraltar Chickweed is found mainly on the North Face, which is the only population that appears not to be threatened at present. It also grows in the Rock Gun area, where it grows on stony ground and in the limestone crevices. Also encountered along Martin's Path and Mediterranean steps, and recently found on the north-facing cliffs below Devil's Gap.

POPULATION TREND: Decreasing, considered vulnerable.

Threats

Recent threats have come from the proposed development of part of the Rock Gun area as the site for a Funicular railway, which would have led to the problem of thousands of visitors wandering around the site. This development was finally rejected by the Development and Planning Commission in May 2005, but puts into question the relative ease with which the Nature Protection Ordinance 1991, Upper Rock Nature Reserve Designation Order and the recommendations of The Gibraltar Development Plan (1991) can be disregarded by developers.

Another serious threat to the species comes from the foraging of a herd of goats in the Rock Gun area, and another herd distributed along the cliffs from Royal Anglian Way to the Lower Slopes in a potential area for this species. Further foraging from Barbary macaques in the Rock Gun area and a traditional site for this species from Prince Phillip's Arch to Douglas Path will seriously affect the survival of this species.

The large population on the North Face would be threatened if cliff works were ever permitted there.

Action

Although the Gibraltar Chickweed is afforded protection under Schedule 3 of the Nature Protection Ordinance and is found within the Upper Rock Nature Reserve, a candidate SAC (Special Area of Conservation under the Habitat's Directive) and a site that was afforded Policy Z19 under The Gibraltar Development Plan 1991, the species is one of the most threatened in Gibraltar. In this context the action necessary at this stage is to emphasize the legal and environmental responsibilities that Gibraltar has to ensure the protection not only of the protected species, including the Gibraltar Chickweed, but also the conservation of their prime habitats for the survival of the species.

To ensure this, the implementation of the recommendations of Perez & Bensusan (2005), to establish a biological reserve within the area denominated as Rock Gun and Middle Hill would be a sensible step forward. The elimination of the herd of goats remains a priority, as is the exclusion of Barbary macaques from the top of Rock Gun.

Cliff work must not be carried out on the North Face.

Ex-situ conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens. The species is not cultivated at present.

This species must be included under Annex II of the Habitats Directive 92/43/EEC and in the World Conservation Union's 'IUCN Red Data List of Threatened Species.

Class: **Angiospermae**

Order: **Centrospermae**

Family: **Caryophyllaceae**

GIBRALTAR CAMPION
Silene tomentosa



Figure 15: Gibraltar Campion *Silene tomentosa*.

General Description

A woody-based perennial that flowers from April to May. The flowers emit a deep fragrant scent at night and on cloudy days, suggesting that this plant is pollinated by nocturnal insects.

Global Distribution

This species is endemic to Gibraltar: *i.e.* its global distribution is restricted to the Rock.

POPULATION TREND: Extinct in the wild, some re-introduced plants survive. Critically endangered.

Local Distribution

Discovered and described by Otth in 1824 (and later by Boissier in 1838 (*S. gibraltarica* Boiss.) who found it growing on the north and east cliffs of the Rock). There were no recent sightings in the wild until 1979 and 1985, when a few plants were observed by L. Linares and A. Harper (Linares *et al.* 1996). This species was widely searched for in subsequent years and deemed extinct, until its rediscovery in 1994, again in the Rock Gun area, from where seeds were taken. All the records of this species have been found above 240m in the specified area. No other wild plants have been seen since, and attempts at reintroduction in favourable areas have so far been of limited success, with only a few plants successfully establish.

Threat

Recent submissions were made to, and rejected by, the Development and Planning Commission pro-

posing the development of much of the species' historical distribution. This development is not compatible with the aims of wildlife conservation since it destroys the integrity of an extremely important habitat.

The species is conservation-dependent, with a population of about 60 in the Gibraltar Botanic Gardens (where it germinates well) and in several other European Botanic Gardens which have been sent material from Gibraltar. The apparent inability of the species to spread naturally in the wild, apparently due to difficulty in germination outside a controlled environment is cause for concern.

Action

On its rediscovery attempts were made to ensure the survival of the species. Cuttings were taken and sent to Kew in London, where the type specimen is housed, and seeds were sent to the San Fernando Botanic Gardens in Cádiz, where the species is doing well. Seeds germinated successfully in the Gibraltar Botanic Gardens, and the species was transferred to some of the beds. A reintroduction programme was attempted, with several plants transplanted to suitable localities and habitats. North-facing cliffs around the top of Mediterranean Steps, Windmill Hill and Rock Gun were chosen but most of the plants did not regenerate the following year, and only that at the top of Mediterranean Steps survived. Attempts have continued with more being planted out in Windmill Hill in winter 2005-2006.

Attempts at reintroduction of this species into the wild should continue on an annual basis until a viable population is re-established. In the meantime *ex-situ* conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens. A search for other wild plants should be undertaken.

No development that poses a threat to any aspect of wildlife conservation within the entire known historical distribution of *Silene tomentosa* should be entertained.

This and other important plant and animal species were left out of the Habitats Directive through lack of reference to Gibraltar experts during drafting. As possibly the rarest plant in Europe, it is therefore imperative that this species is included under Annex II of the Habitats Directive 92/43/EEC. It also requires inclusion in the World Conservation Union's 'IUCN Red Data List of Threatened Species'.

Class: **Angiospermae**

Order: **Tubiflorae**

Family: **Labiatae**

GIBRALTAR THYME *Thymus wildenowii*



Figure 16: Gibraltar Thyme *Thymus wildenowii*. (L. Linares).

General Description

The Gibraltar Thyme is a woody and much-branched aromatic dwarf shrublet that grows from limestone crevices and old stone walls, and flowers between April and July.

Global Distribution

In Europe, this species is known only from Gibraltar, although there are unconfirmed records in the San Roque area (Valdes *et al.* 1987). Although it has been stated that the species is also found in North Africa, its exact status remains ambiguous and there seems to be no indication as to where it is currently found in Morocco.

Local Distribution

This species is quite common and widespread throughout the Upper Rock, mainly found growing from limestone crevices along most roads, and also on old walls such as Charles V Wall. It may also be found wherever there are rocky outcrops on the western and southern slopes, along the upper ridge, and along Martin's Path and Mediterranean Steps, and even down along Hole in the Wall area at Europa Advance. Scattered individuals may even be found on old walls in the Town.

POPULATION TREND: Stable.

Threats

The species is widespread enough not to be under any specific threat, but those growing along the roadsides of the Upper Rock are prone to removal whenever the roadsides are scraped clean of vegetation. A possible future threat would be the removal of all vegetation from the surfaces of old walls such as Charles V Wall. This should not occur however, since these herbaceous plants do not pose a threat to the structure and integrity of the walls, and add character to the same (*C. Viagas, pers. comm.*).

Action

The employees of cleaning contractors must be instructed not to remove vegetation growing from the roadside surfaces above ground level, and restrict themselves to pruning back small trees and shrubs that might interfere with traffic. The relevant authorities must be made aware of the fact that old walls harbour populations of these plants (as well as certain other species such as *Linaria tristis*, *Campanula velutina* and *Helichrysum rupestre*), which do the walls no harm, and should not be removed.

Ex-situ conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens. There is a small cultivated population at present.

This species should be included under Annex II of the Habitats Directive 92/43/EEC.

Class: **Angiospermae**

Order: **Leguminosae**

Family: **Papilionaceae**

GIBRALTAR RESTHARROW

Ononis natrix ssp. *ramosissima* var. *ramosissima*



Figure 17: Gibraltar Restharrow *Ononis natrix* ssp. *ramosissima* var. *ramosissima*. (L. Linares).

General Description

The Gibraltar Restharrow is a much-branched, woody-based shrubby perennial, which forms rounded clumps. It grows on coastal sands and flowers between March and July.

Global Distribution

This variety of the species is endemic to Gibraltar.

Local Distribution

The species is restricted to the Great Sand Slopes of the east side of the Rock, all the way from the northern extremity at Devil's Tower Road, to the southern extremity above Sandy Bay, and also above and below Sir Herbert Miles Road. It is not found elsewhere in the wild.

POPULATION TREND: Increasing.

Threats

At present the species is thriving throughout its habitat, especially on the areas exposed by the removal of the water catchment sheeting. The threat to the species would arise if the habitat, or parts of it, were to be opened up for development, or if it were to be quarried for sand. At present the only threat comes from the spread of the introduced, invasive species *Acacia cyclops* and *Carpobrotus edulis x acinaciformis*. Fire is a serious consideration, for in the summer of 2005 most of the Gibraltar Government's (northern) area of the Sand Slopes was burnt. Monitoring and regular surveys of the Great Sand Slope for the spread of invasives and the status of this plant should take place. Fire hazards should be pointed out as part of these surveys.

Action

The habitat in which this species grows must be allowed to remain in its natural state, and set up as a nature conservation area under the provisions of the Nature Protection Ordinance. This will protect not only this species, but all of the species of plants and animals that make up this unique community. A programme of removal of invasive species would go a long way in safeguarding the future of the habitat, and of the native species found there. Monitoring and regular surveys of the Great Sand Slope, to assess the damage done by the fire and the extent of the encroachment of invasive species is required to formulate a viable conservation management plan for this site. The designation of the Great Sand Slopes as within the candidate Special Area of Conservation (cSAC) will benefit the welfare of the species.

Ex-situ conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens. The species grows well in the sandy soils of the Gardens.

Class: **Angiospermae**

Order: **Plumbaginales**

Family: **Plumbaginaceae**

GIBRALTAR SEA LAVENDER

Limonium emarginatum



Figure 18: Gibraltar Sea Lavender *Limonium emarginatum*. (L. Linares)

General Description

A hairless perennial flowering mainly between March and September. This species grows on cliffs and rocky ground in close proximity to the sea.

Global Distribution

Endemic to the Strait of Gibraltar, where it is mainly found on the Rock, with scattered populations along the Tarifa area of the Cadiz coastline and on the opposite side of the Strait in Morocco and Ceuta.

Local Distribution

Found mainly along the coastal cliffs around the Europa Point area with an important concentration on Europa Foreshore where the plants form large dense cushions. The plant is also distributed along the east sea cliffs from Europa Point to Catalan Bay and along the west to Rosia Bay. Never found far from the sea, where they are washed by sea spray, except for some plants found on the cliffs in the vicinity of Martin's Cave on Mediterranean Steps, some 200m above sea level.

POPULATION TREND: Stable.

Threat

Europa Foreshore has in the past been selected for development proposals, although the area where the plants grow is not suited for this since it is exposed to strong easterly winds and frequently washed in sea spray. The other plants found scattered along the cliffs on the eastern side are not under threat since their inaccessibility and location affords them protection, except where cliff works are proposed.

Much of the area in the south district where the species is found, in particular areas adjacent to cliff habitat and the Europa Foreshore, is an invasive hot spot. Here numerous invasive species of plant compete for resources and space with the Sea Lavender, and should be removed (see chapters 4 and 6).

Residents at Europa Foreshore have released pet rabbits that have become feral and which could graze on this plant.

Action

The main colony of plants on Europa Foreshore requires protection as the species forms a dense community at the eastern end of this habitat, the like of which is not found elsewhere. This protection should be in the form of a nature conservation area on the Europa Foreshore, since there are a number of other interesting plant species that are only found in this area.

The eradication of the feral rabbits on the Europa Foreshore is a priority if the community of plant species found in this interesting habitat is to survive.

Ex-situ conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens. Some specimens grow in the Gardens, although germination success is poor.

Class: **Angiospermae**Order: **Rhoedales**Family: **Cruciferae**

GIBRALTAR CANDYTUFT
Iberis gibraltarica



Figure 19: Gibraltar Candytuft *Iberis gibraltarica*.

General Description

The Gibraltar candytuft is a robust, woody-based, branched perennial, which grows from limestone crevices on the cliffs and screes. It flowers from March to June.

Global Distribution

A native of Morocco and Gibraltar, with Gibraltar being the only European station for the species.

Local Distribution

Found on cliffs ranging from the North Face of the Rock, along the cliffs above the east side sand slopes, and on to the cliffs around Europa Point and Windmill Hill round to the west up to the easternmost cliff of the North Gorge area. It is also found on stony ground elsewhere, such as the south-facing slopes from O'Hara's Battery to Windmill Hill Flats and on rocky outcrops on the Upper Rock. Scattered plants may be seen elsewhere including the east side sand slopes. Occasionally by the sea.

POPULATION TREND: Stable.

Threats

So long as the cliff habitats are not interfered with, the species is under little threat. However, cliff stabilisation programmes do pose a threat. Encroachment of shrub vegetation in some areas may reduce local populations on outcrops and screes away from cliffs.

Action

Cliff stabilisation must be avoided. Any that is absolutely inevitable due to current safety needs should be carried out with care and attention to species of plants and animals found on the cliffs. Concreting must be avoided.

Woody vegetation control on the Upper Rock should be carried out if isolated populations are threatened.

Ex-situ conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens, where there is a thriving population.

Class: **Angiospermae**Order: **Rosales**Family: **Saxifragaceae**

GIBRALTAR SAXIFRAGE
Saxifraga globulifera subsp. *gibraltarica*



Figure 20: Gibraltar Saxifrage *Saxifraga globulifera* subsp. *gibraltarica* (L. Linares).

General Description

The Gibraltar Saxifrage is a herbaceous perennial that grows in shady limestone crevices and stone walls and flowers between April and June.

Global Distribution

This subspecies is endemic to Gibraltar.

POPULATION TREND: Stable but vulnerable.

Local Distribution

The largest population of this species can be found at Rock Gun, growing on old, stone walls. Some are also found growing from limestone crevices in the northern part of the disused catchment area between Rock Gun and above Green's Lodge Road. Very few can also be found near the top of the road leading to the Upper Galleries. Here they grow from limestone crevices along the east side of the road. Another stand can be found near the top of Mediterranean Steps, growing again from limestone crevices. Scattered plants were once discovered among rocks along Bruce's Farm firebreak and on the Lower Slopes of the Upper Rock. However recent searches have failed to find them.

Threats

The threat to this species comes from two sources: the activity of Barbary macaques in both the Rock Gun and O'Hara's Battery areas where they cause disturbance to the habitat and the plants themselves, and from the deliberate clearing of the roadsides and walls at the Upper Galleries. The latter has already occurred repeatedly, with a large number of plants scraped away. This could also be a threat to the population at Rock Gun if this area was targeted for development.

Action

Implementation of the recommendations in Perez & Bensusan (2005) to establish a biological reserve within the area denominated as Rock Gun and Middle Hill would protect the habitat of the species. The present location of the main stands should be pointed out to cleaning contractors of the Upper Rock Nature Reserve, so that there is no interference with the plants or their habitats. Seeds should be collected, and sown in areas identified as suitable. These should also be grown at the Gibraltar Botanic Gardens and then relocated to suitable sites both inside the Gardens and on the Upper Rock. Members of the Caves & Cliffs Section of GONHS could be instrumental in introducing plants to more inaccessible sites.

Ex-situ conservation should be encouraged through cultivation and banking of seed in the Gibraltar Botanic Gardens, although this has been tried without success.

This subspecies should be included under Annex II of the Habitats Directive 92/43/EEC.

Class: **Angiospermae**Order: **Lurales**Family: **Lauraceae**

SWEET BAY OR LAUREL
Laurus nobilis



Figure 21: Sweet Bay *Laurus nobilis*. (L. Linares).

General Description

The Sweet Bay is a tree or large shrub with aromatic, evergreen leaves and shiny grey bark. Clusters of small yellow flowers are produced in spring, followed, on the female plants, by shiny black or purple berries about 1.3 cm long.

Global Distribution

A native species of the Southern Mediterranean, also grown in other countries for its aromatic leaves which are used for culinary purposes. The plant is native in the wetter areas of the Parque Natural de los Alcornocales on the west side of the Bay of Gibraltar.

Local Distribution

The Sweet Bay is mainly restricted to the South District where it has survived in gardens, but is also found in the lower boundaries of the southern end of the Upper Rock Nature Reserve. There is also a stronghold of this species in the North Gorge. Isolated pockets of the species – what is believed to be a relict population – can be found on the cliffs below Rock Gun and around the St. Michael's Cave area. POPULATION TREND: Increasing.

Threats

Areas in the South District are under development pressure. The North Gorge site was due for development (Highcliffe House), but the plans were changed at the insistence of the Development & Planning Commission following a site assessment and recommendations by GONHS.

Action

This species and the habitat associated with it, classified as habitat code 5230 as 'Matorral with *Laurus nobilis*' is considered a priority habitat under Annex I of the Habitats Directive 92/43/EEC.

The main stronghold of the species, in the Mount Gardens and North Gorge should be protected as this is a Priority Habitat type under the Habitats Directive. These two areas hold most of the mature trees that escaped in the deforestation 1700s, while the North Gorge site (below Windmill Hill Road) holds a large number of young trees in what is a naturally regenerating woodland. This area should be given nature conservation area status under the Nature Protection Ordinance.

Evidence of the relict stands on inaccessible cliffs around Rock Gun point to the Bay Laurel as one of the main arboreal species found in Gibraltar before humans wiped out the natural vegetation. Monitoring of the spread of this species on the Rock will bolster efforts for the conservation of this species.

Class: **Angiospermae**Order: **Contortae**Family: **Oleaceae**

NARROW-LEAVED ASH
Fraxinus angustifolia



Figure 22: The Narrow-leaved Ash *Fraxinus angustifolia*. (L. Linares).

General Description

The Narrow-leaved Ash is an upright deciduous tree with a broadly oval crown sometimes reaching 10m in height. The trunk is smooth and brown on young trees but becomes grey with ridges and furrowed with age. It flowers in early spring before the leaves sprout, with male maroon flower dense clusters and looser green female flowers. The leaves are shiny, dark green above and lanceolate, 10-15cm long, serrated and tapering. It grows best in damp soils.

Global Distribution

Native of North Africa and the Iberian Peninsula, the tree has been introduced to many countries with similar Mediterranean climatic conditions.

Local Distribution

Found mainly within the gardens of the Mount and elsewhere in the south District. The species has spread into the surrounding area with many young saplings along Engineer Road at the entrance to the Upper Rock. Also well represented in the Sandpits area, south of the Botanic Gardens and present also in the Gardens and the Trafalgar Cemetery where a particularly large specimen can be seen.

POPULATION TREND: Increasing.

Threats

The species is not under threat but due to its limited distribution could be adversely affected by the development of its main strongholds.

Action

The remnants of the species in gardens points to the time when these areas remained as a refuge for trees after the felling of combustible material on the Rock during the Great Siege and other sieges. This species of tree is representative of fairly moist Mediterranean woodland and it is probable that it flourished on the lower parts of the Rock, including the area where the Town now stands, together with other native species that were wiped out. It is therefore gratifying to see that the species is self seeding into the surrounding area and would benefit from a recovery programme that would introduce the species into other areas of Gibraltar.

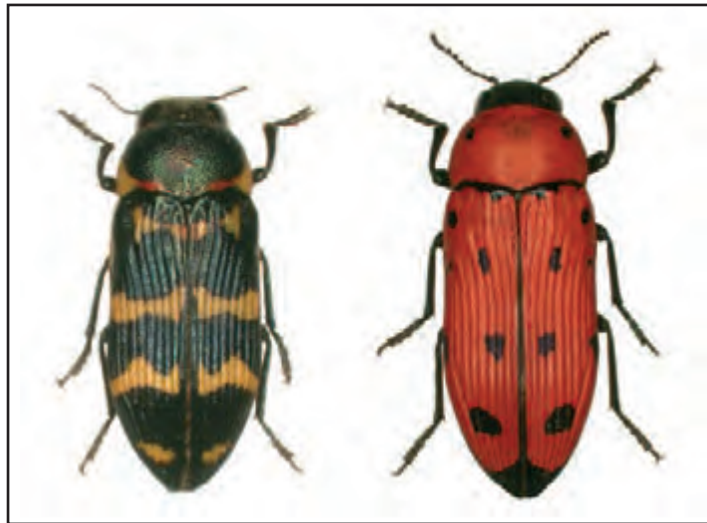
Class: **Insecta**Order: **Coleoptera**Family: **Buprestidae*****Buprestis (Yamina) sanguinea ssp. calpetana***

Figure 23: *Buprestis (Yamina) sanguinea ssp. calpetana*, male (left) and female (right).

General Description

The larvae of this attractive jewel beetle feed on plants of the genus *Ephedra*. In Gibraltar, they are found on *Ephedra fragilis*, the only representative of this genus on the Rock. Adults or imagos emerge no earlier than mid-July, and are most easily encountered near their host plants during August. Larvae take two years to develop into adults, during which time they feed within the stems of *Ephedra*. The presence of larvae within their host plants does not seem to affect these plants in any way, since more numerous emergences of imagos seem to occur on healthier specimens of *Ephedra*.

Buprestis sanguinea ssp. calpetana exhibits strong sexual dimorphism, an unusual trait amongst beetles.

Global Distribution

In Iberia, *Buprestis sanguinea* is widespread but very scattered. Originally known only from mountains in Teruel in Aragon, it has now been recorded in other parts of Aragon, Cataluña, Madrid and Murcia, as well as in Gibraltar (Perez & Bensusan 2006). The species, which was originally described from North Africa, where it has been recorded from Morocco to Libya, has now been split into two subspecies; *B. s. iberica* from Spanish populations and *B. s. calpetana* from Gibraltar (Verdugo *et al.*, 2006)

Local Distribution

Buprestis sanguinea ssp. calpetana is endemic to Gibraltar where it is only found on its host plant *Ephedra fragilis*. This plant is quite widespread in Gibraltar, where it grows mainly on cliffs and rocky garigue habitats. So far, this beetle has only been located along Mediterranean Steps, at Governor's Cottage and Mediterranean Road, above Sandy Bay and on the Talus above Catalan Bay. It is likely however that it occurs wherever numerous healthy examples of *Ephedra fragilis* grow.

POPULATION TREND: Stable.

Threat

As is most often the case with invertebrates, habitat destruction is the most serious threat to this species. Since a large portion of the local distribution of this species falls within the Upper Rock Nature Reserve or otherwise within the candidate SAC, its future seems secure locally. However, the recent spate of cliff stabilisation work could threaten it in some key areas, since large and healthy populations of *Ephedra fragilis* grow in cliff habitats.

Action

A reduction of cliff stabilisation measures would benefit not only this beetle, but also all fauna and flora reliant on cliffs as their habitat.

Buprestis sanguinea ssp. calpetana could make an interesting subject for research projects, given that very little is yet known about the species' biology and that it has an interesting distribution. As such, a blanket ban on collection of individuals is not desirable. Rather, it should be protected under schedule 1 of the

1991 Nature Protection Ordinance (L/N 11 of 1991), with collection allowed only by serious researchers and coleopterists under licence. Coleopterists collecting specimens should not be allowed to collect more than five individuals a year, unless a specific research licence is granted.

The restricted global distribution and the fact that the Gibraltar taxon is classified as a separate subspecies (Verdugo *et al.*, 2006.) requires that this beetle be included under Schedule 1 of the Nature Protection Ordinance (L/N 11 of 1991). *Ephedra fragilis* should be removed from Schedule 2 of the Nature Protection Ordinance which, as this is a reverse-list, would afford it protection.

Class: **Arachnida**

Order: **Aranei**

Family: **Hexathelidae**

GIBRALTAR FUNNEL-WEB SPIDER

Macrothele calpeiana



Figure 24: Gibraltar Funnel-web Spider, *Macrothele calpeiana*. (K. Bensusan).

General Description

The Gibraltar Funnel-web Spider, *Macrothele calpeiana* occurs in damp shady localities, and is mainly nocturnal in its habits. It lives within a burrow under rocks, on tree trunks and in old walls. The burrow is lined with a simple web funnel that is anchored to surrounding objects. The females can be found with egg-sacs and spiderlings from the end of July onwards, and its diet includes isopods and hymenoptera, coleoptera and other insects (Gallon, 1994).

Global Distribution

Formerly thought to be restricted to a small area of southern Spain and Gibraltar, its range is now known to cover much of southern Andalucía and new data points to isolated populations elsewhere including as far north as southern Extremadura (Díaz Rodríguez & García Villanueva, 2000)

Local Distribution

Found mainly in damp wooded areas in gardens and the Nature Reserve, and occasionally in caves and buildings. Large populations are also known from the East Side.

POPULATION TREND: Stable.

Threats

The spider is well distributed around Gibraltar and its survival as a local species is not under threat.

Action

This species is protected by the Nature Protection Ordinance 1991 and listed under Annex II of the Habitats Directive 92/43 EEC (Helsdingen & Decae, 1992), which requires designation of its habitat as a Special Area of Conservation, and therefore its prime habitats should be conserved at all costs. In this respect, much of its habitat is being considered at the present time for designation. It is important however to note that some of the prime sites for this species fall outside of the candidate SAC, and local legislation must be implemented to ensure that the future of the species in Gibraltar is safeguarded by affording protected status as nature conservation areas under the Nature Protection Ordinance to such sites.

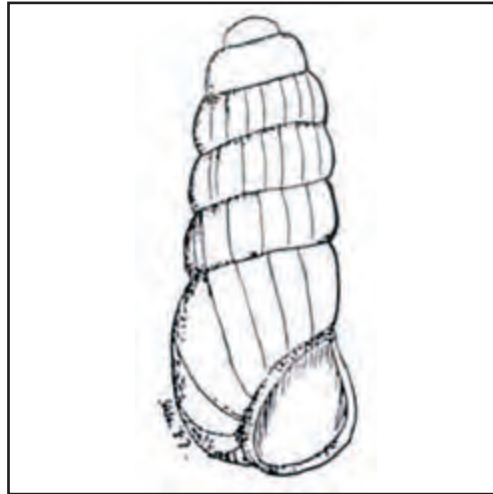
Class: **Gastropoda**Order: **Architaenioglossa**Family: **Aciculidae*****Acicula norrisi***

Figure 25: *Acicula norrisi* Gittenberger and Boeters, 1977.
Actual height 2.9mm (drawing by Salli Menez).

General Description

Shells have been found in soil and leaf litter samples adjacent to limestone rocks and cliffs. The species has not yet been collected live, but very fresh shells with remnants of animals inside, indicate the species is extant. These fresh shells are generally found under rocks (approximately to 0.5m below soil level) in scree and garigue habitats. (Menez *in prep*).

Global Distribution

Endemic to Gibraltar.

Local Distribution

Found in Windmill Hill Flats, Mediterranean Steps, the slopes around Little Bay and the Europa Foreshore.

Threat

Habitat destruction in parts of its range (in particular areas on the lower levels of the Upper Rock and near Windmill Hill Flats).

Action

The verification of live populations and their study is a priority.

Once these requirements have been established the possibility of translocation to new localities, with a view to increase the distribution of the species locally, should be investigated.

The maintenance of habitats where the species occurs and prevention of development in these habitats (that are also important for many other taxa).

Although the species is afforded local protection under the Nature Protection Ordinance 1991 (L/N 1991), and the Endangered Species (Import and Export) Ordinance 1990, the species does not have international protection. Therefore this endemic species should be included under Annex II of the Habitats Directive 92/43/EEC and in the World Conservation Union's 'IUCN Red Data List of Threatened Species'.

Most of the locations where the species is found are included within the habitat action plans for the South District and the Upper Rock Nature Reserve. Windmill Hill and the Upper Rock have been included as a candidate Special Area of Conservation cSAC, and this should guarantee the welfare of the species.

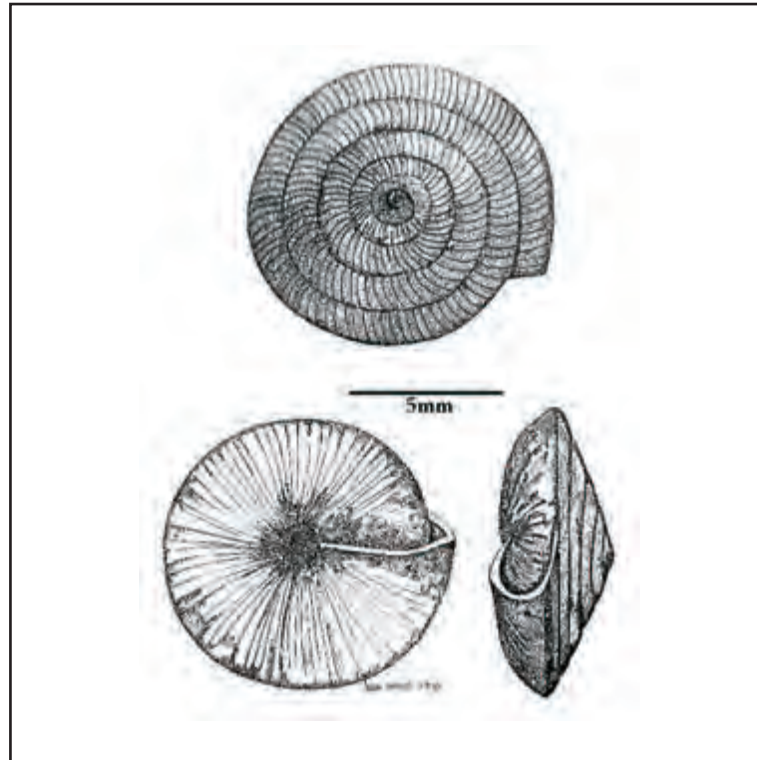
Class: **Gastropoda**Order: **Pulmonata**Family: **Trissexodontidae****OSTEOPHORA CALPEANA**

Figure 26: *Oestophora calpeana* (Morelet, 1854). (drawing by Salli Menez).

General Description

Never abundant, typical densities in sampled areas of 400m² are 0.1-1/m² (Menez, *in prep.*). Usually found under rocks, logs and other types of shelter in steppe, garigue and maquis habitats.

Global Distribution

This species has a restricted range and is known only from the area of the Strait of Gibraltar, with records from Tangier and Ceuta in North Africa, and from Gibraltar, its type locality.

Local Distribution

Found on the Great Sand Slopes and Talus Slopes, the Upper Rock Nature Reserve and Lower Slopes, Windmill Hill Flats, the slopes around Little Bay and the Europa Foreshore.

Threats

Habitat destruction in parts of its range (in particular areas on the lower levels of the Upper Rock and near Windmill Hill Flats).

Action

Most of the locations where the species is found are included in specific Habitat Action Plans and Windmill Hill and the Upper Rock have been included as a candidate Special Area of Conservation (cSAC) that should guarantee the welfare of the species.

Although the species is afforded local protection under the Nature Protection Ordinance 1991 (L/N 1991), and the Endangered Species (Import and Export) Ordinance 1990, it does not enjoy international protection. It would be desirable, due to its restricted global distribution, for the species to be included under Annex II of the Habitats Directive 92/43/EEC and in the World Conservation Union's 'IUCN Red Data List of Threatened Species'.

Class: **Gastropoda**Order: **Archaeogastropoda**Family: **Patellidea**

MEDITERRANEAN RIBBED LIMPET
Patella ferruginea



Figure 27: Mediterranean Ribbed Limpet *Patella ferruginea*. (A. Yome)

General Description

A large limpet measuring up to 10cm at its widest, with strongly ribbed furrows. The species lives on rocky substrates above sea-level on the upper mesolittoral zone. Normally found on natural rocky shores. In one location near Gibraltar, Ceuta harbour, it has recently been found to be more abundant on artificial harbour stones than on natural rocky substrate (Guerra Garcia *et. al.* 2003). This may be due to the fact that there is a strong current flow in that harbour, as most harbours in fact have a high level of pollution, not beneficial to the species.

Global distribution

Endemic species of the Western Mediterranean sea. Found mainly along the Iberian and North-west African Mediterranean coastline with a small population in Sardinia.

Local distribution

Scarce along the rocky shoreline of Gibraltar with a recently discovered population on the western end of the runway (D. Fa *pers.comm.*)

POPULATION TREND: Increasing.

Threats

The main threat to this species, which lives within the inter-tidal zone, comes from pollution. The increase in bunkering activities in the Bay together with other industries, in particular the Oil Refinery, poses a potential oil pollution problem that could seriously affect the well-being of the species in Gibraltar. Development of our natural shoreline and reclamation projects has seriously undermined the natural habitat of the species. Some of these projects have severely affected the current flows, particularly within the Gibraltar Harbour, fundamental for the survival of the species.

Action

Legal Status: The species is the most endangered marine invertebrate in the Western Mediterranean and as such is Included in the Annex II of the Bern Convention, Annex II of the Barcelona Convention; 'Convention for the protection of the Mediterranean Sea against pollution' and Annex IV of the Habitats Directive 92/43 EEC under 'Animals and Plant Species of Community Interest in need of strict Protection'.

In Gibraltar it is afforded protection under the Nature Protection Ordinance (L/N 1991), and in Schedule I of the Endangered Species Ordinance (1990-54).

The recently discovered population of this species on the western end of the runway constitutes the richest and largest concentration of the species in the Iberian Peninsula (D. Fa *pers. comm.*). The site is composed of concrete blocks that were placed there to protect the runway from erosion that have only been there less than fifteen years. It is therefore a recent colonisation and augers well for the future as this type of shoreline protection may provide an alternative habitat for this species. However, this should not be viewed as justification for the destruction of natural shores, as colonisation is by no means certain, and will depend on many other conditions, including current flow. Neither does this mean that artificial substrates are more suitable for the species. The species will therefore need continual monitoring, population surveys and ongoing research to provide the optimum conditions for its welfare and survival in Gibraltar.



6. Alien, Invasive & Pest Species

Gibraltar Neanderthals

6. Alien, Invasive & Pest Species

Alien species are species that have been introduced, either intentionally or accidentally, in habitats where they do not form part of the native wildlife. Many exotic plant species thrive in gardens and urban green areas, but in many cases have to be maintained artificially in order for them to survive. Most of these plants cannot survive in the wild. Similarly, many species of exotic animals can be found in nature reserves, wildlife parks and zoos, and many are kept as household pets. Most are dependent on our attention for their survival and could not continue to exist in the wild.

There are exceptions among some species that, not only survive, but invade new habitats and outcompete the indigenous species to establish themselves as one of the dominant species in their new environment. These are termed 'invasive' or 'alien' species, and are generally considered second only to habitat loss as the biggest threat to biodiversity.

The rapid increase in global trade, travel, tourism and exchange in goods this century has boosted the cases of biological invasions worldwide, and continues to be a major threat to biodiversity. The impact caused by invasive alien species includes not only the irreversible damage done to native species and their ecosystems, but also on the management costs required to control, mitigate and rectify the problem.

It is imperative that there be a mechanism to address the impact of alien species, primarily through sound legislation and enforcement, and clear guidelines that provide instructions for control, eradication, and mitigation.

The Gibraltar Government through the Ministry for the Environment need to establish a programme for the control and eradication of invasive species of flora. This should include mitigation measures with a restoration and improvement programme for all sites that are affected by invasive species. Several factors need to be taken into consideration, amongst which are:

- Identify the scale and size of the problem.
- Establish a means of control through biological, chemical and/or manual methods.
- Identify the manpower required for the establishment of a works team.
- Ensure the removal of the species before these go to seed.
- Identify a suitable disposal site and method that will not prejudice other areas.
- Conduct a habitat restoration programme.
- Follow up with a monitoring programme of all areas affected.

These points will need to be applied to all invasive species of flora.

Local goals to address the invasive and pest species problem.

- Evaluate risks associated with the introduction and spread of invasive species.
- Identify, monitor and exclude pathways involved in the introduction of invasive species.
- Promote information for reducing the risk of invasive species introduction to Gibraltar.
- Detect early and respond rapidly to populations of new invasive species in a cost effective and environmentally sound manner.
- Provide leadership to other agencies to resolve problems associated with invasive and pest species.
- Promote public education on invasive and pest species and how to address them.
- Document, evaluate, and monitor the impacts of invasive and pest species on the economy, environment and human health.
- Legislate against the introduction of alien species that are known to be problematic, even as pets or household plants.

Public awareness campaign for the reduction of invasive species.

- Verify that the plants you are buying for plant pots or gardens are not invasive.
- Replace invasive plants in your garden with non-invasive alternatives.
- Ask your suppliers for help in identifying invasive plants.
- Do not import live flora and fauna when travelling.
- Fruits and vegetables, plants, insects and animals can themselves carry pests or become invasive.
- Do not release aquarium fish and plants, live bait or other exotic animals into the wild.
- Return unwanted pets to the pet shop.
- Become a volunteer with GONHS or the Botanic Gardens to help remove invasive species.
- Help educate others about the invasive and pest species threat.

Alien Plant Species in Gibraltar.

Gibraltar has not escaped the worldwide phenomenon of biological introductions and invasions. Indeed, if we look closely at our most charismatic species, the Barbary macaque was introduced in recent history, by either the Romans or Moors. There is no evidence in the fossil record of this animal being present on the Rock after the last glaciation. Through colonisation by different cultures many species of wildlife were introduced into Europe from Asia and Africa. The Olive tree *Olea europea*, is believed to have come from the Eastern Mediterranean, and is now established as a key species in Iberia and is the dominant plant species in Gibraltar.

Colonisation by the British in 1704 and the establishment of trade links with the British Empire outposts resulted in the arrival of innumerable exotic species en route from the colonies to the British Isles (Cortes & Abrines 1994). Some of these species were eventually incorporated into the gardens of military dwellings in Gibraltar, where the climate was favourable. Among them were many species from South Africa, Australia and South America, and many of them still survive in the wild today. Most were harmless, colourful exotics, but a few species that were introduced into Gibraltar have proved to be serious invasives, whilst others are potential invasives. A list of all alien species of flora, with their country or region of origin, can be found in Table 1.

Table 1: Alien species of flora found in Gibraltar.

Common Name	Latin Name	Country of Origin
Blue-Leaved wattle	<i>Acacia saligna</i>	West Australia
Red-eyed acacia	<i>Acacia cyclops</i>	Australia
Swamp wattle	<i>Acacia retinoides</i>	South Australia
Tree houseleek	<i>Aeonium arboreum</i>	Morocco
Pink houseleek	<i>Aeonium haworthii</i>	Canary Islands
Century plant	<i>Agave americana</i>	Mexico
Green century plant	<i>Agave ghiesbreghtii</i>	S Mexico; Guatemala
Tree of heaven	<i>Ailanthus altissima</i>	China
Cape wattle; Swamp wattle	<i>Paraserianthes lophantha</i>	S & W Australia
Soapy aloe	<i>Aloe maculata</i>	South Africa
Tree aloe	<i>Aloe arborescens</i>	South Africa
Spreading amaranth	<i>Amaranthus blitoides</i>	America
Narrow-leaved amaranth	<i>Amaranthus muricatus</i>	South America
Cape weed	<i>Arctotheca calendula</i>	South Africa
Giant reed; Cane	<i>Arundo donax</i>	Asia (probably)
Bridal creeper	<i>Asparagus asparagoides</i>	South Africa
Squamate aster	<i>Symphotrichum squamatum</i>	South America
Golden bur-marigold	<i>Bidens aurea</i>	Central America
Lesser bur-marigold	<i>Bidens pilosa</i>	South America
Rescue brome	<i>Bromus unioloides</i>	South America
Hottentot fig	<i>Carpobrotus edulis x acinaciformis</i>	South Africa
Cestrum	<i>Cestrum parqui</i>	South America
Chasmanthe	<i>Chasmanthe floribunda</i> subsp. <i>floribunda</i>	South Africa
White horseweed	<i>Erigeron bonariensis</i>	South America
Horseweed	<i>Erigeron canadensis</i>	South America
Canadian fleabane	<i>Erigeron sumatrensis</i>	North America
Lesser swine-cress	<i>Coronopus didymus</i>	South America
Ivy-leaved toadflax	<i>Cymbalaria muralis</i> subsp. <i>muralis</i>	Sicily, Yugoslavia, Switzerland
Greater thorn apple	<i>Datura innoxia</i>	Central America
Thorn apple	<i>Datura stramonium</i>	Central & S America
Disphyma; Round-leaved Pigface	<i>Disphyma crassifolium</i>	South Africa
Dragon tree	<i>Dracaena draco</i> subsp. <i>ajgal</i>	Canary Is. & Morocco
Red gum	<i>Eucalyptus camaldulensis</i>	Australia
Blue gum	<i>Eucalyptus globulus</i>	Tasmania
White snakeroot; Snow thoroughwort	<i>Eupatorium rugosum</i>	North America
Freesia	<i>Freesia refracta</i>	South Africa
Bristly-fruited silkweed	<i>Gomphocarpus fruticosus</i>	South Africa
White iris	<i>Iris albicans</i>	Arabia
Mother of thousands	<i>Kalanchoe tubiflorum</i>	Madagascar
Four o'clock plant; Marvel of Peru	<i>Mirabilis jalapa</i>	Tropical America & Mexico
Myoporum; Waterbush	<i>Myoporum tenuifolium</i>	Australia
Shrub tobacco	<i>Nicotiana glauca</i>	South America

Common Name	Latin Name	Country of Origin
Large-flowered evening primrose	<i>Oenothera erythrosepala</i>	America
Pink evening primrose	<i>Oenothera rosea</i>	South America
Prickly pear; Barbary fig	<i>Opuntia ficus-indica</i>	Tropical America
Prostrate cactus	<i>Opuntia vulgaris</i>	Tropical America
Pink oxalis	<i>Oxalis articulata</i>	South America
Procumbent yellow sorrel	<i>Oxalis corniculata</i>	North America
Bermuda buttercup ; Cape sorrel	<i>Oxalis pes-caprae</i>	South Africa
Greater millet grass	<i>Paspalum dilatatum</i>	Brazil & Argentina
Millet grass	<i>Paspalum paspalodes subsp. paspalodes</i>	Tropical America
Pelargonium	<i>Pelargonium inquinans</i>	South Africa
Canary palm	<i>Phoenix canariensis</i>	Canary Islands
Virginian or American pokeweed	<i>Phytolacca americana</i>	Central & North America
Ombu	<i>Phytolacca dioica</i>	South America
Greater plantain	<i>Plantago major subsp. major</i>	Eurasia & N America
Castor oil plant	<i>Ricinus communis</i>	Tropical Africa
Californian pepper tree; Peruvian mastic tree	<i>Schinus molle</i>	South America
Climbing groundsel	<i>Senecio angulatus</i>	South Africa
Apple of Sodom	<i>Solanum sodomaeum</i>	South Africa
Nasturtium	<i>Tropaeolum majus</i>	South America
Spiny cocklebur	<i>Xanthium spinosum</i>	South America
Cocklebur; Rough cocklebur	<i>Xanthium strumarium subsp. cavanillesii</i>	North America

The majority of these alien plant species are located within gardens and urban green areas and do not pose a threat to the native species of flora. Nevertheless, some species have established themselves in the wild, with varying degrees of success, and some are invasive and are causing serious damage to the natural environment. These species require an action plan that will address their control and removal, and tackle the restoration of affected habitats.

Table 2: Alien species of concern that have become established in the wild.

Species	Threat	Species	Threat
<i>Acacia cyclops</i>	vp	<i>Chasmanthe floribunda</i>	vp
<i>Acacia saligna</i>	p	<i>Disphyma crassifolium</i>	p
<i>Aeonium haworthii</i>	p	<i>Lantana camara</i>	pp
<i>Aeonium arboreum</i>	p	<i>Nicotiana glauca</i>	p
<i>Agave americana</i>	p	<i>Opuntia ficus-indica</i>	vp
<i>Agave ghiesbreghtii</i>	p	<i>Oxalis pes-caprae</i>	p
<i>Ailanthus altissima</i>	vp	<i>Paraserianthes lophantha</i>	vp
<i>Aloe arborescens</i>	pp	<i>Pennisetum clandestinum</i>	vp
<i>Aloe maculata</i>	pp	<i>Senecio angulatus</i>	vp
<i>Asparagus asparagoides</i>	pp	<i>Tropaeolum majus</i>	p
<i>Carpobrotus acinaciformis x edulis</i>	vp	<i>Yucca elephantipes</i>	pp

vp: very problematic; p: problematic; pp: potential problematic

Table 2 lists those species of concern that have become established outside garden areas. Among these are several that are notorious invasive plant species. Many species in the main table do not pose a threat to the natural environment, although they could become a potential threat in the future. Nevertheless many of these species have become established within Gibraltar and compete with the native flora. They should therefore be removed.

Alien Invasive Flora

The threat posed by many of the alien invasive species of flora that have become established in the wild calls for the preparation of alien species action plans that will address concerns, and present solutions and recommendations. The criteria used in selecting the species are based on several factors. Amongst these are species already causing serious damage and spreading significantly (classified as very problematic, 'vp'), species that are less damaging and threatening but also capable of spreading (problematic, 'p') and those species that are serious invasives in other countries and could become a serious concern in the future, but are not at present established in Gibraltar (potentially problematic 'pp').

The action plans for alien species provide a short description and photograph of the plant in question, together with global distribution and a detailed description of the local distribution. Where the species has an extensive local distribution, a map shows the location of species presence within the red dots covering 10m². A summary of the details of the threat and damage the species is causing locally is covered extensively together with remedial action, recommendations and where possible detailed methods for the control and/or eradication of the species. These include manual, physical, biological and chemical control methods. The invasive species problem within the Nature Reserve should be tackled by the works team recommended in the chapter on introduced flora in 'Upper Rock Nature Reserve. A Management and Action Plan' (Perez & Bensusan, 2005). This works team is already clearing many of the paths and could also be employed to tackle the invasive flora elsewhere in Gibraltar.

A useful addition to the plan is a list of publications dealing with the invasive species problem in other countries. These could prove helpful in the preparation of alien invasive species programmes.

Alien Invasive Species of Flora for which action plans have been prepared:

<ul style="list-style-type: none"> • Rooikrans • Orange or Golden Wreath Wattle • Pinwheel & Tree Houseleek • Century Plants • Tree of Heaven • Tree Aloe & Soapy Aloe • Hottentot Fig • African Cornflag • Purple Dewplant • Bush Lantana or Shrub Verbena • Shrub Tobacco • Prickly Pear • Bermuda Buttercup • Cape Wattle • Kikuyu Grass • Cape Ivy • Nasturtium • Spineless Yucca 	<ul style="list-style-type: none"> <i>Acacia cyclops</i> <i>Acacia saligna</i> <i>Aeonium haworthii</i> & <i>A. arboreum</i> <i>Agave americana</i> & <i>A. ghiesbreghtii</i> <i>Ailanthus altissima</i> <i>Aloe arborescens</i> & <i>A. maculata</i> <i>Carpobrotus edulis x acinaciformis</i> <i>Chasmanthe floribunda</i> <i>Disphyma crassifolium</i> <i>Lantana camara</i> <i>Nicotiana glauca</i> <i>Opuntia ficus-indica</i> <i>Oxalis pes-caprae</i> <i>Paraserianthes lophantha</i> <i>Pennisetum clandestinum</i> <i>Senecio angulatus</i> <i>Tropaeolum majus</i> <i>Yucca elephantipes</i>
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Alien Species Action Plan

Class: **Magnoliopsida**Order: **Fabales**Family: **Mimosaceae**

ROOIKRANS *Acacia cyclops*



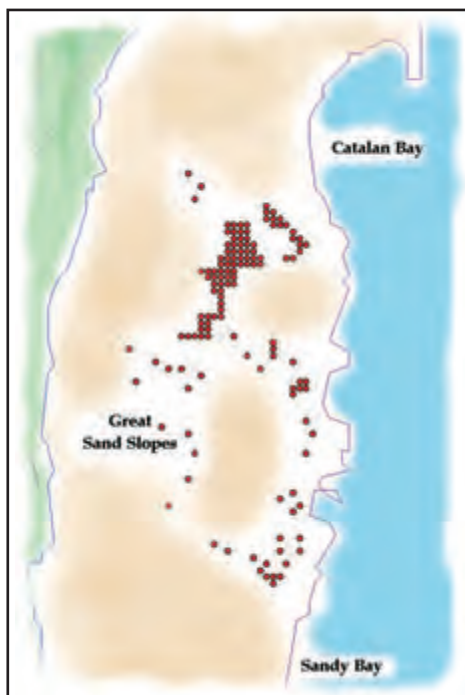
Figure 1: The Rooikrans *Acacia cyclops*, and open seed-pods.

Description & Biology

A dense, slow growing evergreen bushy shrub or small tree from 3 to 8 metres tall, often multi-stemmed with a rounded crown. The foliage is comprised of light green phyllodes growing in a downward vertical position and is resistant to sand blast and salt spray. Pods mature in the summer, but are not shed and remain on the tree. The seeds remain viable in the soil for many years (Duke, 1983).

Global Distribution

A native of South-western Australia where it mainly grows on coastal dunes. Introduced in many other parts of the world, including South Africa, where it was used for stabilisation on sand and sandstone, but is spreading into coastal bush and heathland.



Local Distribution

Found mainly on the northern end of the Great Sand Slopes above the Caleta Hotel, in an area that was not required for the water catchment, and where it was planted for sand stabilisation, together with a large number of palms of the species *Phoenix canariensis*, and some *Acacia saligna*. From there it is quickly spreading to the newly restored habitat on the Great Sand Slopes.

Figure 2: Distribution of *Acacia cyclops* on the eastern side of the Rock. The main concentration is the original site of the plantation. Note the spread of the species on the Great Sand Slopes since the removal of the water catchments.

Threat

A very dangerous invasive species, *Acacia cyclops* is an extremely weedy species. Once established, it is difficult to remove or replace. There is little natural vegetation cover beneath an *Acacia cyclops* thicket. It has no natural enemies in Gibraltar and the *Acacia* thicket is devoid of any animal or plant life, creating a veritable desert for native wildlife.

The *Acacia* stand was restricted to this area for many years and was incapable of spreading to the nearby talus slope. Nevertheless with the removal of the water catchments, a huge area of suitable habitat has now been opened up for colonisation. Within the space of a few years this invasive has quickly spread into the adjacent area and is threatening the biodiversity of this newly restored habitat. Most of the new plants can be found in a narrow band along the lower reaches of the slope where the seeds have spread. Surprisingly, some plants can be found higher up the slope and the method of seed dispersal to these areas is unknown.

This invasive is one of the most serious threats to biodiversity in Gibraltar and is threatening the unique habitat of the Great Sand Slopes, a habitat that was recently restored through collaboration of the Gibraltar Government and the MoD, with GONHS and the Botanic Gardens, who seeded the slopes with native flora.

Action

Urgent action is required within the next few years for the control and eradication of the species from Gibraltar. If this does not happen soon, the welfare of the Great Sand Slopes, a candidate Special Area of Conservation (cSAC) will be compromised, and the costs involved in remedying the problem at a later stage will only escalate.

A biological control agent, the species of beetle called the 'Rooikrans Seed Weevil' (*Melanterius servulus*) is used for the control of this species in South Africa. It was used for the first time in 1994 and is confined to its host plant species. The adult feeds on the flowers and developing seeds. The female feeds on the walls of the developing pods and lays its eggs on the seeds, where the larvae feed on the seed tissue (ARC-PPRI).

Given the isolation of this invasive in Gibraltar and the host dependency of the biocontrol agent, it may be possible to use this species as a control method to arrest the invasive plants' dispersal until such time as the *A. cyclops* plantation is finally removed.

In lieu of the biological control agent, manual control through the use of herbicides is preferable. The dead material would later need to be removed and the area re-seeded with local species.

Further Reading

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Class: **Magnoliopsida**Order: **Fabales**Family: **Mimosaceae**

ORANGE OR GOLDEN WREATH WATTLE
Acacia saligna



Figure 3: The Golden Wattle or Orange Wattle. *Acacia saligna* (L. Linares).

Description & Biology

A large shrub or small tree growing up to height of 10 m, sometimes developing a spreading crown. The bark is smooth and grey to red-brown on small branches. Young plants become dark grey and fissured with age. Long branches are regularly covered in flowers that are composed of large golden balls in spring (Michaelides, 1979). It occurs on poor acid or calcareous sands, and succeeds in the most dry and adverse soil conditions.

Global Distribution

Native to the south-western corner of Western Australia, it has become naturalised in parts of Eastern Australia. It is found mainly on sandy soils along the coastal plain. Used for eroded hillsides and wastelands and for stabilizing drifting sands, it has been introduced in many parts of the world, including North Africa, the Middle East, South Africa and for gully erosion in Uruguay.

Local Distribution

Found in very small numbers in the *Acacia cyclops* plantation on the Great Sand Slopes. It is also used as an ornamental garden plant and can be seen in Casemates, Queensway and the Botanic Gardens. In addition, some scattered individuals can be found throughout Gibraltar.

Threat

This is a species that was obviously introduced with *Acacia cyclops* for its sand binding qualities. The plant spreads by means of suckers and is therefore a difficult species to eradicate. Roux and Middlemiss (1973) state that caution is advised when using *A. saligna*, for in South Africa the species has become a major weed and displaced indigenous species. It should therefore be treated as a potential invasive and, together with *A. cyclops*, be removed.

Action

This species requires the total eradication from the Great Sand Slopes in conjunction with the action programme mentioned under *Acacia cyclops*.

Older plants are susceptible to the gall rust, *Uromycladium tepperianum* and various gall-exploiting insects, and in South Africa this gall rust is used as a biological control agent. A biocontrol agent for this species is not required in Gibraltar, given the small size and distribution of the population of the species.

Ornamental plants may continue to be planted in landscaped gardens, although the species should not be sited close to where the root system could spread the species into the wild. In this respect, the species is totally unsuitable for planting in residential areas within the Nature Reserve or other areas close to wild natural habitats.

Class: **Magnoliopsida**Order: **Saxifragales**Family: **Crassulaceae**

PINWHEEL & TREE HOUSELEEK
Aeonium haworthii & *A. arboreum*



Figure 4: Tree Houseleek *Aeonium arboreum* in flower.

Description & Biology

A. arboreum is an erect, thick stemmed succulent shrub with a few branches, each bearing a rosette of tightly packed leaves. The plant flowers in winter and early spring with an inflorescence of yellow flowers. It is possible that the Gibraltar population of this species in fact consists of *A. korneliuslemsii* H.Y. Liu (Lamb, 1994). *A. haworthii* has a thinner stem, with many branches bearing rosettes, and has a similar flowering period with creamy pink flowers.

Global Distribution

Aeoniums originate from North Africa and the Canary Islands, but have also been introduced to the Mediterranean region, south-western United States of America and Northern Australia, where it is listed under the 'National list of naturalised invasive and potentially invasive garden plants'.

Local Distribution

The Aeoniums can be found growing together primarily on the southern cliffs of Little Bay and Camp Bay, round to the sea cliffs bordering Europa foreshore. *A. arboreum* is also found in large numbers around the cliffs bordering Windmill Hill, on the east cliffs above Sandy Bay and extend their distribution right up to O'Hara's Battery where they can be found growing on the disused water catchments and adjacent cliffs. A small stand of *A. haworthii* is located on the cliff leading down to Catalan Bay.

Threat

The Aeoniums are cliff dwelling species of plants that grow tightly bunched together, as can be seen at Little Bay. They can therefore form dense mats on the cliffs that exclude native species. It is suspected that the introduction of the species in Gibraltar begun at this location, where they found their way from the gardens in the military dwellings on the cliff above. From here they have quickly spread to most of the cliffs in the south of Gibraltar and have reached the highest point of the Rock. They pose a threat to many of the native cliff growing species, in particular most of the rare species of plants that require special protection such as *Iberis gibraltatica* and *Limonium emarginatum*.

Action

The Aeoniums are classified as 'problematic' (p). It is therefore essential that both species' distributions are closely monitored and their association with other native plants studied in depth to assess the potential threat that these two species pose. It is possible that these species arrived naturally in Gibraltar from the Canaries (Lamb, 1994) in which case they should be considered as a legitimate part of Gibraltar's plant community. Genetic studies should be carried out in order to attempt to ascertain the origins.

Aeoniums found growing in the Rock Gun and Middle Hill area and its surrounding cliffs should be removed, as this is the stronghold of most of Gibraltar's rare plants.

A specialist team of climbers will be required for the removal of the species from cliffs. Since this team should be able to recognise important native species and problematic invasives, the GONHS Cliffs and Caves section is the best-qualified and most appropriate body to tackle invasives and monitoring of species on cliffs.

Class: Liliopsida

Order: Asparagales

Family: Agavaceae

CENTURY PLANTS
Agave americana & *A. ghiesbreghtii*



Figure 5: Century Plant *Agave americana* invading the Great Sand Slopes.

Description & Biology

The Century plant *Agave americana*, is basically a basal rosette formed by very large grey-green leaves up to 2 metres long and 30cm wide with marginal, curved spines and a viciously-tipped spine of over 4 cm. The flower stalk grows in the late spring and summer up to a height of over 7 metres. It is branched and grows yellow-green flowers that are pollinated by insects and birds. The seeds germinate on the branches of the stalk, which eventually dies and collapses (sometimes uprooting the whole plant), but in so doing propagating the new plants. *Agave ghiesbreghtii* is a less robust plant, with a flowering stem up to 5m tall. The leaves are shorter and dark green and have smaller but more numerous marginal spines along the edges.



Figure 6: An 'invasive hot spot', *Agave ghiesbreghtii*, with *Carpobrotus acinaciformis x edulis*, and *Acacia cyclops* bushes in the background growing on the Great Sand Slopes.

Global Distribution

Both species occur naturally in arid areas of eastern Mexico.

Local Distribution

Mainly found on the Great Sand Slopes, above the Caleta Hotel and above the Both Worlds residential area. *A. americana* is also found widely in the Europa Point area, especially on the foreshore where it is associated with a number of other introduced species. Within the Upper Rock Nature Reserve the plant is established on the firebreak at the top of Charles V Wall, close to the Cable Car Station and just below the Queen's lookout. Elsewhere the plant is grown as an ornamental garden species within the Botanic Gardens and along Rosia Road.



Figure 7: Main distribution of *Agave americana* on the east side of the Rock.



Figure 8: Main distribution of *Agave americana* in the South District.

Threat

Agave americana and *A. ghiesbreghtii* are classified as 'problematic' (p). Planted on the sand slopes along the water catchment drains, the plants are beginning to disperse widely, due mainly to the angle of the slope that allows the new plantlets to roll down when the main stem collapses. This allows greater dispersal than on level ground. This same problem is occurring with the few specimens found within the Upper Rock Nature Reserve, which are also growing on slopes.

Plants growing around Europa Point are more tightly bunched and form large, impenetrable stands where the huge rosettes of leaves exclude the sunlight and do not allow the growth of native plant species. The problem is compounded on the Europa foreshore below where these plants grow in association with other species of introduced flora that include *Aloe maculata*, *Opuntia ficus-indica* and *Carpobrotus edulis x acinaciformis*.

Action

The removal of the species from the priority areas of the Great Sand Slopes and the Upper Rock Nature Reserve, where the species is the main threat, is urgently required. This should be followed with the removal of the species from the foreshore together with other individual plants around the Europa Point area.

This is an easy species to tackle, mainly because of the few plants involved. The risk of accidental dispersal during removal is also minimal.

Further Reading

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- **Waterhouse, D.F. (1997)** *The major invertebrate pests and weeds of agriculture and plantation forestry in the Southern and Western Pacific.* The Australian Centre for International Agricultural Research, Canberra. p. 59.

Class: **Magnoliopsida**Order: **Sapindales**Family: **Simaroubaceae**

TREE OF HEAVEN
Ailanthus altissima



Figure 9: Tree of Heaven *Ailanthus altissima* (L. Linares).

Description & Biology

Also known as Ailanthus, Chinese Sumac or stinking Sumac, this is a rapidly growing deciduous tree that can reach a height of over 10 metres. *A. altissima* has smooth stems with a pale grey bark and reddish brown twigs that are characteristic in the dormant season. It has large compound leaves that are composed of 10-25 smaller leaflets lying alternate along the stem. Flowering in the late spring, the tree produces papery twisted seeds in the autumn that are called samaras, and many remain on the tree for a long period.

Global Distribution

The Tree of Heaven is native to Central China. It has been introduced to many countries worldwide including forty-two states of the USA.

Local Distribution

The tree can be found behind Catalan Bay within the gardens of the abandoned dwelling called 'Rockfall', and in the old Quarry beside the entrance to Williams Way tunnel. Several specimens grow in the Catalan Bay village and other isolated specimens can be seen near the Talus slope, Sandy Bay and more worryingly on the Great Sand Slopes where they are beginning to spread. Also found in the Upper Rock Nature Reserve in the old PSA Nursery, where there is a great thicket of small individuals and where they are rapidly spreading. Established in the Mount gardens where there are several mature trees and a thicket of young saplings. The species has spread into the lower reaches of the entrance to the Nature Reserve and is capable of spreading further. Also found in gardens in the town area including the Trafalgar Cemetery, where there is a majestic specimen and several saplings, and in the Botanic Gardens, where they were a major problem. However, following an active control programme of felling, pruning and treatment with weed killer, they are now restricted to the northern narrow stretch of garden, and at the southern end where they have become established in the area around the Sandpits Lawn Tennis club.

Threat

A. altissima is an aggressive, rapidly growing tree that produces a great quantity of seeds (up to 325,000 on one tree) and is capable of overrunning the native vegetation. It also reproduces vegetatively through a network of suckers in the root systems that can damage foundations and sewers. Once established, the species forms an impenetrable thicket that prevents the growth of native species through the production of toxins in the ground. The tree is capable of re-sprouting from cut stumps and remnants of the root system.

The stands of trees on the Great Sand Slopes and the Upper Rock Nature Reserve require urgent attention, for the species is rapidly spreading and could over-run the habitats in question. Individual specimens

elsewhere should also be removed before they generate a new problem area.

Action

This species must be eliminated totally from Gibraltar. This must include ornamental garden specimens, as these pose a threat via dispersal to natural habitats. Those planted in urban areas should also be removed because of the potential damage that their root system can cause to structures.

A control, management and eradication programme for the removal of the species urgently needs to be established. Great care is required in the removal of *A. altissima*, due to its high seed production and germination and its vegetative reproduction. Cutting alone is counter-productive since *Ailanthus* responds by producing innumerable root suckers.

Several control methods are available, but the most effective seems to be the use of herbicides, which may be applied to the leaves, the bark and stump. Great care is required to avoid the application to native species growing nearby. This will usually eliminate the plant growing above ground, but the root and sucker system may remain active, and is capable of re-growing. Therefore continual monitoring, at least twice a year, is required to ensure that the herbicide is applied to any re-growth. Constant application will eventually weaken the tree and eliminate the problem, without physically having to tackle the root system. Nevertheless removal of the entire plant including roots and fragments can be done when the soil is moist (Pannil, 1995). In Gibraltar this may prove difficult, due to the rocky and stony nature of the underlying soil in many areas.

Further Reading:

- **Tennessee Exotic Pest Plant Council.(1996)** *Tree of Heaven. Tennessee Exotic Plant Management Manual.*
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Class: Liliopsida

Order: Asparagales

Family: Aloaceae

TREE ALOE & SOAPY ALOE *Aloe arborescens* & *A. maculata*



Figure 10: The Tree Aloe or Red-hot Poker *Aloe arborescens*.

General Description

The Tree Aloe develops into a multi-headed shrub of 2-3 metres high with an attractive rosette of grey green leaves, armed with conspicuous pale teeth. The large, colourful and characteristic inflorescences of red flowers can be seen from December to late January. The flowers produce nectar that attracts birds and insects. The Soapy Aloe's leaves also develop in a stemless rosette but the leaves are dark green, sometimes with a reddish tinge and has distinctive whitish spots. It flowers later than arborescens, with red inflorescence, mainly in the spring.

Global Distribution

Both are native to southern Africa and also found in Malawi, Zimbabwe, Swaziland and Mozambique. Introduced as an ornamental garden plant to many parts of the world, especially in countries with a Mediterranean climate, where the species can grow in the wild.



Local Distribution

The Tree Aloe is distributed in the south of Gibraltar, in the Europa Point area and around to Governor's Cottage and the Europa Advance. Other stands can be found at Sandy Bay, at the southern end of Windmill Hill, at the base of the northern Talus slope, around North Gorge and the Naval Hospital, and within the Upper Rock Nature Reserve where there are stands on the south-facing slopes below Mediterranean road, within the gardens of Ince's and Bruce's farms, Tovey Cottage and the former PSA Nursery.

Elsewhere the species has been planted as an ornamental plant within the Botanic Gardens, the Mount Gardens, along Rosia Road, along the perimeter of St. Paul's church and around Devil's Tower Camp.

The Soapy Aloe is found along the Europa Foreshore, at Hole in the Wall in Europa Advance, near the Cable Car top station and scattered in small clumps along Camp Bay as well as within the main gardens.

Figure 11: Main distribution of *Aloe arborescens* in the south of Gibraltar.

Threat

The Tree Aloe forms a dense cover that excludes native species. Even around the periphery of these clumps, native species do not grow particularly well and are shaded out. The Tree Aloe has until now spread only vegetatively and very slowly. It has been unable to set seed, being self-sterile, and has not therefore been a major threat to the native species. However, soon after the importation of other Tree Aloes into the Botanic Gardens in 1992, presumably of a different clone, it was discovered that the Tree Aloes in the Garden were beginning to set seed. This raises the potential threat of this species to potentially problematic.

Figure 12: Tree Aloe with fruit in the Alameda Botanic Gardens.

The Soapy Aloe is less prolific although they also shade out the native species and could become a problem in the future.





Figure 13: The Soapy Aloe *Aloe saponaria*. (L. Linares).

Action

At the moment the Tree Aloe does not pose a serious threat in Gibraltar. However, it would be wise to eradicate some naturalised populations as these could become problematic in the future. Continual monitoring of the species is required in order to assess the dangers of seed production and distribution, as well as vegetative spread where the species is found.

Class: **Magnoliopsida**

Order: **Caryophyllales**

Family: **Aizoaceae**

HOTTENTOT FIG

Carpobrotus edulis x acinaciformis



Figure 14: Hottentot Fig *Carpobrotus edulis x acinaciformis* (L. Linares).

General Description

The Hottentot fig is a perennial, ground-hugging succulent that roots at the nodes and forms dense deep mats that cover large areas. Its stems reach 2m in length and have bright green succulent leaves, 4-8cm long, that are sometimes tinged with red. The species flowers in spring with large pink to violet flowers, 7-8.5cm in diameter that in some specimens are pale yellow. The Gibraltar plants were long thought to be *C. edulis*, but are in fact a hybrid of *C. edulis* and *C. acinaciformis* that is unable to set seed.

Global Distribution

Native to South Africa, the species has been introduced into other countries with similar climate for stabilisation of sandy soils, and as an ornamental garden plant, especially in Spain, Portugal and France.

Local Distribution

Found in the Europa Point area, especially on scree slopes adjacent to sea cliffs, and at the base of the Great Sand Slopes where they were planted for sand stabilisation, despite the fact that the species is unsuitable for this on steep sites due to its shallow root system. Some other stands can be found at the base of the northern talus slope and in the North Front aerial farm, with a few on the Upper Rock.



Figures 15 & 16: Main distribution of the Hottentot Fig, *Carpobrotus edulis x acinaciformis*.

Threat

The Hottentot Fig is a hardy plant that can survive in poor soils and endure drought conditions and exposure to sea spray. These qualities have meant that they form healthy, impenetrable mats that exclude native species. It is mainly an invasive of dune-type habitat, as can be seen on the Great Sand Slopes, and is capable of suppressing the growth of both native seedlings (D'Antonio 1993) and mature native shrubs (D'Antonio and Mahall 1991). The Hottentot Fig is capable of lowering the soil pH in loamy sand (D'Antonio 1990a), and has been found to change the root system morphology of some native shrub species in California coastal scrub (D'Antonio and Mahall 1991).

In Gibraltar, the Hottentot Fig soon covers extensive areas that dominate habitats, excluding the growth of most native species. It is therefore a serious invasive that is classified as very problematic (vp). We are lucky that the plant does not set seed. Nevertheless, it is an aggressive species that requires total eradication from natural habitats. However, it may continue to be used as an ornamental garden plant, except in locations where there is a likelihood that the species may invade natural wild habitats. The restoration of the Great Sand Slopes has opened up a potential area for invasion by this species, although the angle of the slope will make any vegetative spread upwards difficult.

Action

The Hottentot Fig needs to be urgently removed, in particular from the Foreshore, Great Sand Slopes and small pockets within the Upper Rock Nature Reserve, after which removal must continue from all other sites in Gibraltar.

There are several methods that can be used. The most effective (although labour intensive) is the manual removal of mats. This has been carried out successfully by GONHS in a number of areas on Windmill

Hill Flats with the collaboration of visiting military personnel. It was also removed from the mound at Europa Point as part of the 'Clean up the World Campaign' in September 2005, where a large area was cleared. With enough manpower, large areas can be cleared quickly, but because the plant can grow shoots and roots from any node, all live segments must be removed to prevent contact with the soil and resprouting. Removal using this method can be done at any time of the year but late summer is recommended because the water content of plants will be lower and they will consequently weigh less.

The plant has few pest species associated with it, and these are ineffective as biocontrol methods. Two species of scale insect, *Pulvinariella mesembryanthemi* and *P. delottoi* have been identified but their impact on the plant is negligible (Washburn and Frankie 1985). The parasitic plant Dodder *Cuscuta planiflora*, which is found in Gibraltar, has also been associated with this species, but its impact is again minimal.

Chemical control using herbicides has been successfully used. Guerreiro (1976) recommends glyphosate at 5.4 kg/ha as the most rapid and complete control; with 3.6 kg/ha control still excellent although less swift. Paraquat + simazine at 1.6 + 3 kg/ha is also satisfactory and benzoylprop-ethyl at 2 kg/ha will provide an adequate control. Adding an acidifier to hard water will increase its effectiveness, and including a 1% surfactant to break apart the cuticle on the leaves increases mortality (Albert, Cal-IPC). Herbicides should not be used on small patches of the plant that can be removed manually, as native plant species could be affected. Late summer and autumn application of herbicides is best, as this impacts less on dormant native species.

Further Reading:

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- **Weber, E.; D'Antonio, C. M. (1999)** Phenotypic plasticity in hybridizing *Carpobrotus* spp. (Aizoaceae) from coastal California and its role in plant invasion. *Canadian Journal of Botany*, 77: 1411-1418
- **Vilà, M.; Weber, E.; D'Antonio, C. M. (1998)** Flowering and mating system in hybridizing *Carpobrotus* (Aizoaceae) in coastal California. *Canadian Journal of Botany*, 76: 1165-1169.
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Class: **Liliopsida**Order: **Asparagles**Family: **Iridaceae**

AFRICAN CORNFLAG
Chasmanthe floribunda



Figure 17: African Cornflag *Chasmanthe floribunda*. (L. Linares).

General Description

Commonly known as the African Cornflag, *Chasmanthe floribunda* is a geophytic perennial plant growing to a height of 1m. The leaves are flat, broad and sword shaped, and the deep orange flowers, which emerge in late winter and early spring, grow on either side of the central spike. The plants are mainly propagated by the division of the corm, but they also set seed in Gibraltar. It is a drought resistant plant, preferring well-drained soils and open, sunny locations.

Global Distribution

Native to South Africa where another two species of this genus can be found, the plant has been introduced as an ornamental garden plant in many parts of the world including California, south-western Australia and countries along the Mediterranean, where it has become naturalised and is considered a serious invasive weed.

Local Distribution

Found mainly within the Upper Rock Nature Reserve, with a large stand of this species on the St. Michael's Cave firebreak. Also established in isolated patches around residential areas from where they have spread, especially Ince's and Bruce's farms, Tovey Cottage, Jews' Gate and the Cable Car top station. Outside the Nature Reserve there are isolated pockets of the species on Windmill Hill.

Threat

Chasmanthe is classified as a very problematic invasive species that is rapidly spreading along open areas within the Upper Rock Nature Reserve. It is outcompeting the indigenous flora for space and sunlight, a flora that is already threatened by the encroachment of the dense maquis on firebreaks and open areas. On the St. Michael's firebreak, the plant has quickly spread to cover extensive areas of the slope, replacing native species that formerly grew there, notably *Iris filifolia*. The problem has been aggravated by the angle of the slope, which has aided seed dispersal. Isolated populations on the Upper Rock also seem to be spreading, with new plants appearing around established stands every year.

Action

Control of this invasive is fairly straightforward since the species is found in open areas and concentrations that enable their manual removal or the application of herbicides quite easy. Manual removal of the corms in the late summer and autumn in areas where the soil is less stony is recommended. The application of herbicides just after growth has started in the autumn is also a useful way to eliminate the plant.

This species should also be removed from gardens within the Reserve and included in the list of plants that should not be introduced as a garden plant in the Upper Rock Nature Reserve (Perez & Bensusan 2005).

Class: **Magnoliopsida**Order: **Caryophyllales**Family: **Aizoaceae**

PURPLE DEWPLANT
Disphyma crassifolium



Figure 18: Purple Dewplant *Disphyma crassifolium*. (L. Linares).

General Description

The Purple Dewplant or Round-leaved Pigface is a salt resistant prostrate, ground-hugging, mat-forming succulent shrub with clavate leaves and a generally rounded keel. It flowers in the spring with innumerable reddish-violet flowers forming an attractive mat on the ground, and reproduces vegetatively.

Global Distribution

Native of South Africa, the plant has been introduced to Western Australia, California, and Mediterranean countries where it has become widely naturalised.

Local Distribution

Found mainly along the cliffs around Europa where the plant forms dense mats, and down on the Europa Foreshore.

Threat

Disphyma has been classified as being a potential problematic plant. The plant forms a dense mat that excludes native vegetation in a similar way as the Hottentot Fig *Carpobrotus edulis x acinaciformis*. At the moment the plant does cover an extensive area of cliff opposite the Governor's Cottage, and excludes and smothers the Gibraltar Sea Lavender. Another stand is found in the yard of the Lighthouse and both are contained from spreading by the sea cliff and roadside walls.

Action

If at any time the species was capable of setting seed or established itself in other areas where it could spread extensively, then the species would be re-classified as problematic and would require a specific control programme.

For the time being the species will only require regular monitoring.

Class: **Magnoliopsida**Order: **Lamiales**Family: **Verbenaceae****BUSH LANTANA OR SHRUB VERBENA***Lantana camara*

Figure 19: Bush Lantana *Lantana camara* (L. Linares).

General Description

The Shrub Verbena or Bush Lantana is a rugged, evergreen shrub capable of growing up to 2m high and spreading up to 3m wide. Some varieties are able to clamber up, supported on other shrubs, and reach greater heights. It has a strong root system and sprouts vigorously after pruning. The stems are woody with spines and rough hairs, and the rough green leaves emit an unpleasant smell when crushed. The species flowers throughout the year in clusters of mainly yellow, orange and red flowers, with white or purple in some varieties. It sets a cluster of green fruit that turns purple when ripe and is poisonous to pets, although ingested by birds. Lantana is a drought resistant plant that also does well in humid conditions but does not tolerate frost.

Global Distribution

Originally a native of the West Indies. Introduced to the Pacific Island nations, it also occurs in Australia, New Zealand, China, Thailand, Cambodia, Viet Nam, Malaysia, Indonesia, the Philippines, the Mediterranean, and some parts of sub-Saharan Africa.

Local Distribution

Grown as a hedge plant for its evergreen leaves and colourful flowers, Lantana is a common ornamental plant in Gibraltar. Spreads by self-seeding in the Botanic Gardens, especially in areas where the ground is watered at least occasionally. Recently found naturalised in the wild within the Upper Rock Nature Reserve where several plants were discovered in 2004.

Threat

This species has been nominated as being among the 100 'World's Worst' invaders by the IUCN Invasive Species Specialist Group and is classified locally as a potentially problematic invasive species. Lantana is an understory competitor where it will out-compete the native plants and cover extensive areas, forming dense, impenetrable vegetation.

Seed ingestion by birds seems to have been the method of dispersal of the newly discovered plants. These plants, one of which is a relatively mature shrub, are devoid of the ample leaf cover found in garden specimens, and do not seem to fare well in the stony soils of the Upper Rock. It therefore seems probable that the plant is not suited to the environmental conditions found within the Upper Rock Nature Reserve. Nevertheless, the potential threat remains and the best solution in order to avoid any future problems would be to remove any plants found growing in the wild.

Action

Identify the location where plants are growing in the wild and manually remove these by cutting down and uprooting the plants. The cultivation of this plant in Gardens within the Nature Reserve should be prohibited.

Class: **Magnoliopsida**Order: **Solanales**Family: **Solanaceae****SHRUB TOBACCO**
Nicotiana glaucaFigure 20: Shrub Tobacco *Nicotiana glauca*. (L. Linares).**General Description**

The Tree or Shrub Tobacco is a rapidly growing, small tree with straggling branches reaching some 4-8m in height. Its leaves are ovate, pale green and rubbery in texture. It flowers in warm conditions from spring to late autumn, with yellow cylindrical flowers that are able to produce from 10,000 to 1,000,000 small seeds on a single shrub. Young plants grow very quickly in poor and disturbed sandy and well-drained soils, and are able to tolerate drought conditions and some salinity. It is closely related to the Tobacco plant but does not contain nicotine.

Global Distribution

Native to Bolivia and Argentina, but introduced as an ornamental garden plant in Mediterranean climates where it has become naturalised. Invasive in Mexico, South Africa, Israel, Australasia North America and Europe.

Local Distribution

This species seems to colonise and grow rapidly in disturbed areas (it was the first shrub to colonise the reclamation area on the eastern side), but is then overtaken by the growth of indigenous species and struggles to maintain a foothold. It is found mainly along the eastern side of the Rock in sandy habitats along the Talus slopes and the Great Sand Slopes, which it invaded as soon as the water catchment sheets were removed. This species was one of the dominant plants here but has since died back and allowed other native species to grow. Also found in small numbers along the rock catchment area from Camp Bay to Little Bay, the Europa Point area and the Europa Foreshore, with smaller numbers of plants on the Isthmus. They also grow in the urban habitat from crevices in old walls and buildings.

Threat

The species is classified as problematic, given the invasive capability of the plant to colonise new and disturbed areas. Nevertheless the Shrub Tobacco has not proved to be a lasting threat since many of the plants fare poorly on attaining maximum growth, and do not seem to affect the native flora adversely for any length of time.

Action

Monitoring of the species and assessing its invasive tendencies and survivorship, and surveying the species' distribution on the eastern side of the Rock to ensure that the plant is dying back seem to be the only requirements, since the species does not seem, for the moment, to be affecting the indigenous flora negatively.

Further Reading:

- **Conant, P. et al. (1997)** Appendix. Selected plant species interfering with resource management goals in North American natural areas. In: J. O. Luken & J. W. Thieret, eds., *Assessment and management of plant invasions*. (PI Invasion).
- **Goodspeed, T. H. (1954)** The genus *Nicotiana*. *Chron. Bot.*, 16: 335.
- **Henderson, L. (2001)** *Alien weeds and invasive plants: a complete guide to declared weeds and invaders in South Africa*. Plant Protection Research Institute, Handbook 12. (Weeds SAfr 2001).
- **Weber, E. (2003)** *Invasive plant species of the world: a reference guide to environmental weeds*. (Invasive PI Spec).

Class: **Magnoliopsida**Order: **Caryophyllales**Family: **Cactaceae**

PRICKLY PEAR
Opuntia ficus-indica



Figure 21: The Prickly Pear *Opuntia ficus-indica* in flower. (L. Linares).

General Description

The Prickly pear, an evergreen perennial, is a massive, trunk-forming, segmented cactus, bearing large pad like leaves called cladodes, with few spines. The species flowers on the perimeter of the pad, and yellow or orange cup-like flowers bloom in late spring and early summer. The round, 10cm-long, green fruit, surrounded by masses of very short spines, ripen in the early autumn and turn orange to purple in colour. The fruit is edible.

Global Distribution

The original habitat of this species is uncertain although they originate in the Americas and are believed to be native to Mexico. Introduced to other countries worldwide, they have become naturalised in Argentina, China, Ethiopia, Haiti, Sicily and Spain and have become an invasive species in Australia and South Africa.

Local Distribution

Cultivated in the surrounding region for their fruit and also previously used as a boundary hedge plant, the prickly pear has a wide local distribution.



Figure 22: Distribution of the Prickly Pear *Opuntia ficus-indica* in the south of Gibraltar.

The main stronghold is in the area of Hole in the Wall, where in the last twenty years they have spread to cover large areas of the rocky slopes, and are extending along the cliff up towards Mediterranean steps and the Upper Rock Nature Reserve. Also abundant around the Ince's Farm and Devil's Gap area from where it is believed they spread. The species has now extended to cover large areas of the surrounding, west-facing cliffs and is beginning to spread further into the Nature Reserve. Smaller, isolated stands can be found around the Bruce's Farm and PSA Nursery area, Tovey Cottage and the east side cliffs above the Sand Slopes just below Middle Hill. Another important stand can be seen down on Europa Foreshore in the company of other invasives, and isolated plants are located in the North Gorge, around Camp Bay and Sandy Bay.



Figure 23: Distribution of the Prickly Pear *Opuntia ficus-indica* in the centre of Gibraltar.

Threat

The threat to biodiversity caused by the Prickly Pear is immense. The species already covers extensive sensitive areas of habitat, particularly the foreshore and around Hole in the Wall, where several important species of plant are being threatened by the continual expansion of this species. The Upper Rock Nature Reserve is also under threat, in particular Mediterranean Steps, a unique cliff habitat area of great environmental value. This site is being threatened by the spread of the species along the cliffs from the Hole in the Wall. The Devil's Gap/Bruce's farm area, where the species is rapidly spreading, is also threatened.



Figure 24: The Prickly Pear *Opuntia ficus-indica* at Hole in the Wall. Only the Dwarf Fan Palm, *Chamaerops humilis* can penetrate this dense cover.

The prickly pear has been present at these localities for many years, but in the last decade some unknown environmental factors seem to have favoured the spread of this species, and it is now regarded as a serious problem and classified as very problematic.

The eradication of the plant from the wild in Gibraltar is seen as an essential step in conserving some of the Rock's more important habitats.

Action

The establishment of a programme for the eradication of this species in the wild is a priority. There are several control methods that have been used widely, especially in Australia and South Africa, where the species has reached invasive proportions. In these two countries the extent of the invasions has necessitated the use of biocontrol agents. Several have been identified, tested and used and have proved amongst the most effective entomological control methods ever used in controlling an invasive species. Amongst these is the cactus moth, *Cactoblastis cactorum* (a native of South America) that was introduced during the 1930s, when the South African Parliament declared prickly pear a national disaster. This species effectively controls the spread of the wild prickly pear, while allowing the cultivation of the food crop, the cactus pear. Cactus pear growers regard the moth as a pest, but this species can be controlled by the use of pesticides. This species was also effectively used in Australia where they were used successfully against *O. ficus-indica* and *O. stricta* (Klein, 2002).

Cochineal insects, sap-sucking insects that feed on the cactus, are also used. The species *Dactylopius opuntiae* of the 'ficus biotype' is the biocontrol agent of the Prickly Pear (Klein, 2002).

Another two biocontrol agents were tested in South Africa but did not contribute significantly towards the control of the species, although they did damage the plants. These were the beetles *Metamasius spinolae*, which is the most destructive cactus insect in its native range and *Archlagocherius funestus*, which attacks only Prickly Pear but caused little damage to the plants.

The Prickly Pear can also be controlled through the application of herbicides. A similar invasive species, *Opuntia stricta*, was affecting the Dom António Xavier Pereira Coutinho Nature Reserve in Portugal. Different approaches were assessed simultaneously and the use of glyphosate directly to the plants through injection into the cladodes and stem in the summer proved the most effective (Monteiro et al. 2005).

The herbicide Roundup is effective on the Prickly Pear and the makers recommend the use of Roundup on *Opuntia ficus-indica* as an application injected into pre-made holes in the stems of trees with 20-250 cladodes, applying 2ml of an 18% solution of the product. Roundup is registered for use against Bugweed, Bramble, Lantana, Prickly Pear, and Water Hyacinth. It kills all green plants, grasses included. It is usually applied as a leaf spray at a concentration of 1-2% in clean water. It is not poisonous to animal life and deactivates upon contact with soil. Roundup can also be used as a 2-4% solution to spray onto freshly cut stumps.

Physical removal of the plant is not effective and for those plants established on cliffs, impossible. The species germinates easily and sets root from leaf cladodes that have been torn or discarded. Therefore, the complete removal of the plant is essential to avoid accidental propagation.

In Gibraltar the possibility of the use of the biocontrol agent, the moth *Cactoblastis cactorum*, should be investigated. However, the devastating effect that this may have on prickly pear crops in the region must be taken into consideration, and other methods must be favoured if possible. There are several species of *Opuntia* of conservation value growing in the Botanic Gardens and these would be adversely affected by the moth, although these could be treated against the moth with pesticides.

A serious attempt should be made to treat prickly pear populations with glyphosate herbicides, using GONHS Cliffs and Caves Section to access those on cliffs.

Further Reading:

- **Hernandez, L.R.; Emmel, T.C. (1993)** *Cactoblastis cactorum* in Cuba (Lepidoptera: Pyralidae: Phycitinae). *Tropical Lepidoptera*, 4: 45-46.
- **Johnson, D.M.; Stiling, P.D. (1996)** Host specificity of *Cactoblastis cactorum* (Lepidoptera: Pyralidae), an exotic *Opuntia*-feeding moth, in Florida. *Environmental Entomology*, 25: 743-748.
- **Mahr, D.L. (2001)** *Cactoblastis cactorum* (Lepidoptera: Pyralidae) in North America: a workshop of assessment and planning. *Florida Entomologist*, 84: 465-473.
- **Mayra Perez-Sandi, C. (2001)** Addressing the threat of *Cactoblastis cactorum* (Lepidoptera: Pyralidae), to *Opuntia* in Mexico. *Florida Entomologist*, 84: 499-502.
- **Monteiro A., Cheia VM., Vasconcelos T., & Moreira I. (2005)** Management of the invasive species *Opuntia stricta* in a Botanical Reserve in Portugal. *Weed Research* 45: 193-201.

Class: **Magnoliopsida**Order: **Oxalidales**Family: **Oxalidaceae****BERMUDA BUTTERCUP***Oxalis pes-caprae*

Figure 25: Bermuda Buttercup *Oxalis pes-caprae*. (L. Linares).

General Description

The Bermuda Buttercup is a small, perennial plant that germinates in the late autumn and winter after the first rains. Known locally as the 'Vinagretta' or "Vinagrera", referring to the vinegary, sour-tasting oxalic acid present throughout the plant, the shoots of *Oxalis* arise from a pale brown bulb that is capable of producing over 20 whitish bulbils each year. Leaves arise from a succulent basal stem tip in a cloverleaf form or cloven shape. *Pes-caprae*, meaning goat foot, refers to the shape of the leaf. The species flowers in late winter and early spring, much earlier than most native species, and bears several bright yellow flowers, sometimes double. Locally it is unable to set seed, but spreads through the production of vast quantities of bulbils.

Global Distribution

Native to the Cape region of South Africa, the Bermuda Buttercup is associated with Mediterranean climates and has been introduced to Italy, Greece, the Iberian Peninsula and North Africa and Australia where it is widely invasive (Pierce, 1997). It has also been recorded in North America from California, Florida and Arizona where it is recently becoming a serious problem (Elmore & Cudney, 2002).

Local Distribution

Kelaart (1846) claimed that it arrived in Gibraltar around 1836 as he had been informed by a Captain Mitchell that it was not found in Gibraltar before then. Wolley Dod (1914) stated that it has "increased enormously in recent years". It has now become established as a dominant species and can be found wherever the soil has been disturbed, especially in the south where the species can be seen commonly everywhere, including the cliffs that appear with a yellow mantle in late winter during the flowering period. Restricted mainly to roadsides, firebreaks and open areas within the Upper Rock Nature Reserve, the species appears to be on the increase. Also sparsely found on the Great Sand Slopes but already well established on the Talus slopes and the Isthmus.

Threat

Oxalis is a weed that forms dense mats on the ground, outcompeting the native plant species. Brooks (2001) has found that it inhibits the germination of native species, causes soil enrichment and alters the ecosystem nutrient cycle. The species has been classified as problematic (p).



Figure 26: The Bermuda Buttercup covering part of the Sand slopes. (L. Linares)

We cannot be certain what damage this species has already caused, but it is now established as a dominant species that is virtually impossible to eradicate. Found even in inaccessible areas on cliffs, this species, although potentially competing with native species, germinates and flowers so early in the season that it wilts and dies back when much of the native flora is beginning to sprout. However, competition with native bulbous species is a possibility of serious concern, and this would include the orchids.

The continual scraping of the vegetation and soil along the roadsides on the Upper Rock is aiding the spread of bulbils north to areas where the species was less common.

Action

Very little can be done to address the problem of this invasive, which is now well established, although there are several recommendations that can stop the spread of the species to other areas in Gibraltar. Disturbed soils and habitats that show germination of *Oxalis* should be treated with herbicides and Kelly (2002) reports that glyphosate in a 2% solution just before flowering, achieves a 95% kill rate. Nevertheless the bulbils germinate rapidly, so the areas need to be treated again. Mowing can also deplete the carbohydrate reserves in the bulbs but this needs to be done repeatedly. Roadside scraping and removal of the vegetation on the Upper Rock Nature Reserve is futile and should only take place in the early summer to remove the dry vegetable matter as a fire prevention exercise. This recommendation was included in the Upper Rock Nature Reserve, A Management and Action Plan (Perez & Bensusan, 2005), but the practice continues. The situation has been further aggravated by the use of strimmers along the same roadsides.

No biocontrol agents are available although Kluge & Claassens (1990) reported a potential agent in the form of the moth larvae of *Klugeana philoxalis* that feeds on the shoots of *Oxalis*.

Given the difficulty of eradicating this species, control methods should only be applied where there is a potential risk of invasion to otherwise *Oxalis*-free habitats or danger to the welfare of scarce and rare native species of flora.

Class: **Magnoliopsida**

Order: **Fabales**

Family: **Fabaceae**

CAPE WATTLE *Paraserianthes lophantha*



Figure 27: The Cape Wattle *Paraserianthes lophantha*.

General Description

A straggly shrub or small tree growing to a height of 6 metres, although normally shorter. Twigs are slightly ribbed and leaves are compound, composed of numerous small leaflets similar to many Acacias. The flowers are also similar to those of Acacias, cream yellow in colour, and sprout in a bottlebrush-like cluster. The seedpods are large, broad and flat, each containing between 6-12 shiny black seeds. Like the true Wattles, the Cape Wattle produces huge seed crops, which survive for long periods in the soil.

Global Distribution

The Cape Wattle is a native of Western Australia that has been introduced as a garden plant and is now extensively naturalised in Eastern Australia. It has been introduced to many countries in the Mediterranean region as an ornamental garden plant, and has spread into the wild.

Local Distribution

Located on the Lower Slopes below Devil's Gap, where there are several trees along the footpath to town, from where it seems to be spreading along Green Lane. Elsewhere there are a few individual trees along the car park north of Catalan Bay, which were established through the transfer of some of the material from the Camp Bay rockfall that was deposited there. At Camp Bay there was one old tree that was buried by the rockfall. The rockfall material was then utilised to form a slope at that location and along the base of cliff running to the desalination plant outfall, from where many seeds germinated to form a dense thicket of young plants of this species. Two other specimens can be found on the Rock: one that has recently become established in the middle of the Great Sand Slopes and another located close to St. Bernard's Church in the Europa Point area.

Threat

The Cape Wattle is a fast growing plant that is tolerant of poor soils. It is classified as very problematic (vp) and has obviously done well in the disturbed rocky waste material that was deposited at Camp Bay. It is adapted to recolonising from seed after fire and germinates profusely to dominate the area if there is no control. This particular slope at Camp Bay was affected by fire on 3rd June 2002 (CFB 2002), after which there was a spontaneous germination of plants that have now spread all the way up the slope and are on the verge of invading the Old Naval Hospital residential area, from where it is likely to spread further.

The Lower Slopes stand is already spreading at a worrying rate and several specimens can be found within the Nature Reserve just below Ince's Farm.

The one plant on the Great Sand Slopes grows in the area that was burnt in 2005. Given the rapid germination after fire, there is the possibility that the species will spread all over this area.

Action

The eradication of this species is an urgent priority. The specimen on the Great Sand Slopes must be removed immediately and the site regularly monitored to ensure that this species and other invasives do not germinate at this site.

Similarly the wattle thickets at Camp Bay and the Lower Slopes need urgent removal to stem the spread of the species.

Several methods are used in Australia for the control and removal of this species. Amongst these is hand-pulling, where seedlings and small shrubs can be removed by hand when the soil is moist. This may not be possible in Gibraltar due to the stony nature of the soil. Ring barking of larger plants may be applied as close to the ground as possible. This involves stripping a ring of bark that will stop the growth and in many cases kill the tree altogether. Herbicides can also be applied to the foliage using a glyphosate product, of which there are many different brands available. It can also be applied into a cut in the bark near the ground or painted on. The biocontrol agent, the weevil *Melanterius servulus*, mentioned under *Acacia cyclops*, is also effective against this species.

Further Reading:

- **Cronk, Quentin C. B., and J. L. Fuller. (1995)** *Plant invaders*. Chapman and Hall. 241 pp.
- **Henderson, L. (1995)** *Plant invaders of Southern Africa*. Plant Protection Research Institute Handbook No. 5, Agriculture Research Council, ARC/LNR, Pretoria, South Africa. 177 pp.
- **Hickman, J. C. (1993)** *The Jepson manual: higher plants of California*. U. Cal. Press, Berkeley. p. 583.

Class: **Liliopsida**Order: **Poaceae**Family: **Panicaceae**

KIKUYU GRASS
Pennisetum clandestinum



Figure 28: The Kikuyu Grass *Pennisetum clandestinum*. (L. Linares).

General Description

Pennisetum clandestinum is a creeping, mat forming grass composed of creeping rhizomes and stolons with overlapping leaf sheaths. It flowers from vegetative side shoots with only the stamens visible above the leaves (Holm *et.al.*, 1977).

Global Distribution

The Kikuyu grass originates from tropical east Africa and gets its name from its native area where the Kikuyu tribe originates. Used as a lawn grass, it has been introduced worldwide and can be found in Australia, New Zealand and many South Pacific Islands, North America, Colombia, Peru, Costa Rica and Ecuador in Central and South America, the Indian sub-continent and China and Taiwan.

Local Distribution

This species has spread from the site of the old Royal Navy satellite tracking station on Windmill Hill into the surrounding habitat. From here it has found its way onto the rifle shooting range and along the roadside to the east of Buffadero. Also established on the disused construction site beside Maida Vale where the rhizomes hang several metres down the wall onto the main roadway leading to the Upper Rock, and opposite the Bishop's House, where it is beginning to creep up and into the surrounding vegetation, although here it is restricted by the dense high maquis, for the species is intolerant of dense shade.

Threat

Kikuyu grass is a very aggressive invader of pastures, crops, and natural habitats and is regarded as a crop weed of 14 crops in 36 countries (Holm *et.al.*, 1977). Spreading via an extensive network of rhizomes and stolons, it smothers all the surrounding vegetation including shrubs and young trees. On Windmill Hill, it covers an extensive area that was once rich with native species of plants. Now, the Kikuyu grass covers all the growth and competes for the natural resources and sunlight, impeding the germination of native species. It is also capable of producing allelopathic chemicals that kill other plant species in its vicinity (Sanchez & Davis, 1969).

This species is classified as very problematic (vp) and should be eradicated in its entirety from Gibraltar.

The Kikuyu Grass probably spread to Maida Vale from adjacent gardens, and to other areas of Windmill Hill through the transportation of small pieces of rhizomes and stolons on military vehicles and soldiers' boots and clothing.

Action

Kikuyu grass is very difficult to control manually, but the use of herbicides yields good results. Physically, all the rhizomes must be dug out to prevent re-sprouting and the local nature of the stony soil

renders this practically impossible. Timmins & Mackenzie (1995) recommend the use of several herbicides as a useful control method, amongst which the following products and dilutions are the best; Roundup (without Pulse) 1%, Dowpon 740-SP (16-20 g/l sater), Gallant (0.5%). To allow desirable species to re-establish themselves, the application of methylarsonic acid (MSMA) and triclopyr may reduce the competitive ability of *P. clandestinum* (Cudney *et. al.*, 1993 in Haubensak & Smyth, 1999).

GONHS has already begun to address the Kikuyu grass problem on Windmill Hill. In the spring and summer of 2005 some of the areas were treated with Roundup, and this was continued again in the autumn. This was done through the efforts of the site supervisor WO II Peter Jackson, who undertook to apply the herbicide himself. The site must be monitored to assess the impact of the herbicide on the invasive plant, and more importantly on native species of flora. Application during the dry period seems to be more effective as the herbicide remains in contact for longer with the plant, the plants natural reserves are at its lowest levels, and most native species are dormant.

Other areas, especially those found around Maida Vale must be tackled before the species spreads any further, and the use of this species as a turf grass in Gibraltar must be controlled or banned altogether, as the risk of invasion is too great.

There are no biocontrol methods available although some natural agents do affect the well-being of the kikuyu grass in part. The rust fungus *Phakopsora apoda* appears to reduce the photosynthetic capacity of the leaves in South Africa, but does not kill the plant (Adendorff & Rijkenberg, 1995) and a fungal disease caused by *Pyricularia grisea* kills seedlings (FAO, 2003).

Further Reading:

- **Conant, P. et al. (1997)** Appendix. Selected plant species interfering with resource management goals in North American natural areas. In J. O. Luken & J. W. Thieret, eds., Assessment and management of plant invasions. (PI Invasion)
- **Henderson, L. (2001)** Alien weeds and invasive plants: a complete guide to declared weeds and invaders in South Africa. Plant Protection Research Institute, Handbook 12. (Weeds SAfr 2001).
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- **Wong, F. P., (2004)** First report of *Pyricularia grisea* Causing Gray Leaf Spot on Kikuyugrass (*Pennisetum clandestinum*) in the United States. University of California, Department of Plant Pathology. San Diego.

Class: **Magnoliopsida**

Order: **Asterales**

Family: **Asteraceae**

CAPE IVY
Senecio angulatus



Figure 29: The Cape Ivy *Senecio angulatus*.

General Description

Known as the Cape Ivy, this is a creeping and climbing perennial shrub, entwining around supporting vegetation that can reach a height of over 6m. It has thick, fleshy, glossy, bluntly lobed leaves with one to three teeth on either side. Produces yellow daisy flowers in late autumn and winter, and later feathered seeds that spread easily.

Global Distribution

A native of South Africa, this species has been introduced as an ornamental garden plant to countries in the Mediterranean, Australia and California, from where it has become naturalised in the wild as a pest, invasive species.

Local Distribution

Found mainly behind the Rock Hotel above Europa Road from where it must have presumably spread. Also established on the Lower Slopes along the Footpath to town and within the Upper Rock Nature Reserve where it has escaped from gardens, in particular Bruce's Farm, Ince's Farm, the Devil's Gap residential area and the PSA Nursery. Elsewhere the species can be seen on cliffs around Parson's Lodge, as a ground creeping plant at the entrance to the Governor's Cottage on Europa Advance Road, and in the vicinity of the gardens of the derelict 'Rockfall' house at the entrance to Catalan Bay. Isolated plants can be found in urban areas within the town.



Figure 30: Main affected areas of the invasive Cape Ivy, *Senecio angulatus*.

Threat

A very invasive and aggressive plant in the understorey of open woodland that climbs and smothers shrubs and trees. Particularly aggressive along the lower Rock behind the Rock Hotel gardens where it covers mature olive trees and shrubs with its creepers, blotting out the sunlight and creating an impenetrable mass that covers a huge area. It has also spread from the PSA Nursery, in the Upper Rock Nature Reserve, into the adjacent woodland where it smothers all adjacent vegetation.

This species is doing much damage to the biodiversity of the high maquis habitat and is restricting and in places impeding the growth of understorey species of native plants. The species has been classified as very problematic and requires urgent eradication, especially those found in the main affected areas that can be seen in the distribution map. Significant parts of the Upper Rock Nature Reserve run the risk of being smothered by this species if urgent action is not carried out.

Action

Due to the extent of this invasive plant, a great deal of manpower is required to successfully remove the species. Several different methods can be used, including hacking away at the creepers and allowing them to rot away on the trees. The cut stems require attention. Herbicides will do the job, but this requires regular application. The following recommendations have been reproduced from the 'Greater Wellington Regional Council' web page. (<http://www.gw.govt.nz>).

Treatment methods

- Hand pull or dig out small plants. Dispose of the roots carefully to avoid dispersal.
- Cut stems below waist height, and then spray below this point: glyphosate 10ml/L water; or 2g Escort + penetrant/10L water.
- Stump swab: Escort 5g/L water; or glyphosate 100ml/L water.
- Follow-up work is required.

Work has already begun on the plants found within the PSA Nursery through manual control by a group of volunteers from GONHS who have continually hacked away and uncovered large areas that were once smothered by this species. They have also revealed the extent of the damage when several examples of stunted Almond saplings were uncovered from this dense impenetrable mass.

The invasive species problem within the Nature Reserve should be tackled by the works team recommended in the chapter on introduced flora in 'Upper Rock Nature Reserve. A Management and Action Plan' (Perez & Bensusan, 2005). This works team could also be employed to tackle the invasive flora elsewhere in Gibraltar.

Class: **Magnoliophyta**Order: **Brassicales**Family: **Tropaeolaceae****NASTURTIUM**
Tropaeolum majusFigure 31: *Nasturtium Tropaeolum majus*. (L. Linares).**General Description**

The Nasturtium is a glabrous, somewhat succulent annual that has vine-like climbing stems that spread along the ground and smother trees and shrubs. The leaves are rounded and bright green and the plant flowers in the spring with orange to reddish orange petals that are sometimes streaked with red. Plants are propagated through seeds, vine-like runners and cuttings.

Global Distribution

Native to the Andes Mountains, mainly around Peru, in South America, the plant has been introduced worldwide as an ornamental garden plant where in some countries it has become naturalised in the wild.

Local Distribution

Found mainly in three areas in the wild in Gibraltar: opposite the entrance to the Bishop's House on Engineer Road, where the plant grows profusely in the open areas (competing with the other invasive, the grass *Pennisetum clandestinum*, to the detriment of indigenous flora), in an open area at the entrance to Devil's Gap where the plant is contained between the base of the cliff and the road and covers an extensive area, and south of the Calpe residential area along Willis's Road, on the old water catchment around the lower entrance to the Waterworks.

Threat

This species is classified as problematic (p) and is an aggressive invasive species that tends to form a blanket of leaves, smothering the surrounding vegetation. It prefers open ground in sunny locations and does not do well in shady conditions. It is therefore contained in the small area on Engineer Road as the dense high maquis is preventing its expansion into the Nature Reserve. Nevertheless there is the danger that seeds and small cuttings may accidentally be propagated to other areas of Gibraltar.

The stand at Devil's Gap is more worrying, since the open terrain around the Lower Slopes is an ideal habitat for this species to spread. At the moment it is contained within the base of the cliff and the road, but already there are some plants that have jumped this barrier and are beginning to spread along the slopes.

The stand at the Waterworks is also contained within the water catchment bordered by Willis's Road, but there is a danger that the species will spread into the Nature Reserve.

Action

This plant needs to be tackled urgently, especially the stand at Devil's Gap (in order to avoid propagation further into the Lower Slopes) and that at the Waterworks. The application of herbicides sprayed directly onto the plant is recommended as a useful control method, amongst which the following products and dilutions are the best: Roundup (without Pulse) 1%, Dowpon 740-SP (16-20 g/l sater), Gallant (0.5%). The New Zealand 'Environment Bay of Plenty' Regional Council (www.ebop.govt.nz/weeds/weed308.asp), recommends the use of spraying with Glyphosate + Penetrant as more appropriate than hand pulling for large infestations (Rate - Handgun 1 litre Glyphosate + 200 ml Penetrant/100 litres water. Knapsack 100 ml Glyphosate + 20 ml Penetrant/10 litres water).

Class: Liliopsida

Order: Asparagales

Family: Agavaceae

SPINELESS YUCCA
Yucca elephantipes



Figure 32: The Spineless Yucca, *Yucca elephantipes*.

General Description

The Spineless, Elephant foot or Giant Yucca is a formidable shrub capable of growing up to 9m in height. Mature specimens have a rough and thick trunk that develops a swollen base, hence its scientific name. The shiny green leaves form a spiral rosette that is pliable and lacks the sharp spines found in most Yucca species. The plant often branches a metre off the ground and flowers in winter and early spring on tall stalks with white bell-shaped clusters of flowers.

Global Distribution

Native of Southern Mexico and Central America, it has been introduced to many countries as a popular ornamental garden plant.

Local Distribution

Planted in urban areas around Gibraltar as an ornamental plant, but found naturalised on the edge of the Great Sand Slopes along the northern channel of the Water Catchments where they must have presumably been initially planted and from where they are now spreading.

Figure 33: Distribution of Spineless Yucca, *Yucca elephantipes*.



Threat

The plant is classified as potentially problematic (pp), since there is a serious probability that the species could spread along the Great Sand Slopes. There are already indications that the plant is spreading from this location, although it is confined for the moment to this area. A fire on the Great Sand Slopes in the late summer of 2005 killed several specimens of this plant.

Action

Not a serious problem yet. Nevertheless it is recommended that the plants be removed and included in the eradication programme of invasive species on the Great Sand Slopes.

Uprooting the trunk bases from the sandy soil would be the best method as the plant is capable of rooting if any part of the plant is left behind. The area should be monitored on an annual basis and included in the alien invasive monitoring programme to ensure that the species does not become established again.

Pest Species

A pest species is an injurious plant or animal, especially one harmful to humans. In this exercise we classify pest species as those species that are detrimental to the indigenous biodiversity, and could also have an impact on environment and human health. Pest species can either be native or naturalised. These may have reached pest proportions due to environmental factors or a lack of natural control. Species considered as pests that adversely affect Gibraltar's biodiversity include:

• Bear's Breech	<i>Acanthus mollis</i>
• Black Rat	<i>Rattus alexandrinus</i>
• Barbary Macaque	<i>Macaca sylvanus</i>
• Feral Cat	<i>Felis catus</i>
• Goat	<i>Capra hircus</i>
• Feral Pigeon	<i>Columba livia (domest.)</i>
• Yellow-legged Gull	<i>Larus michahellis</i>

A pest species action plan is included for each except the Barbary Macaque, which is included under the species action plans.

Class: **Magnoliophyta**

Order: **Laminales**

Family: **Acanthaceae**

BEAR'S BREECH *Acanthus mollis*



Figure 34: Bear's Breech *Acanthus mollis*. (L. Linares).

General Description

The Bear's Breech is a herbaceous perennial that grows in upright clumps reaching a height of over a metre. The leaves are very large, dark green, glossy, lobed and toothed, and shade out the surrounding area completely. It grows impressive flower spikes with white and purple flowers that appear in mid April and last until the end of May. Plants spread by thick, creeping rootstocks to form extensive colonies, and by explosive seedpods. A hardy plant, tolerant of poor soils, that does well in full sun and partial shade.

Global Distribution

A native of Southern Europe, and North Africa. A favourite garden plant that has been introduced to many countries including North America, Mexico, Cornwall in Britain, and in parts of Australia and Tasmania where it is considered an invasive species.

Local Distribution

Widespread around Gibraltar, and especially within the Upper Rock Nature Reserve where it has increased in the last 25 years (Linares *et al.* 1996; Linares 1997), and to a lesser extent, on the Lower Slopes. It does well on firebreaks and is a dominant plant of the understorey in some maquis habitats.

Threat

Considered a fine foliage plant for garden shrub borders, Latymer (2001) nevertheless states that the species should be used with caution, as it can easily become a pest and is difficult to remove since the explosive pods scatter seed over a wide area, and plants will re-grow from any scrap of root. In the wild in Gibraltar the plant tends to have invasive characteristics and does not seem to have any pathogens or a natural biological control. It grows in large stands that cover extensive areas, out-competing the local indigenous flora for sunlight and natural resources. Sprouting in winter, the leaves form a dense cover that remains throughout the spring until late April and May, when the softer stemmed leaves soon wilt and begin to die. The stronger-stemmed flower spikes remain upright and the seedpods dry and explode, scattering large quantities of seed widely.

Areas where *Acanthus* is found are devoid of low growing native flora. This is especially serious on the open areas of pseudosteppe habitat and firebreaks that are potentially a refuge for many scarce species of flora.

Action

The eradication of *Acanthus* is difficult given the wide distribution of the plant around Gibraltar. Nevertheless every effort should be made, especially when clearing roadsides, pathways and firebreaks to remove this plant consistently and carefully to avoid seed dispersal. Other native plants may be allowed to grow and it is therefore essential that those tasked with the eradication must be competent in the identification of this and other plants that are detrimental to the environment.

The careful application of herbicides is recommended where large stands of *Acanthus* need to be eliminated, such as on Bruce's Farm firebreak.

Class: **Mammalia**

Order: **Rodentia**

Family: **Muridae**

BLACK RAT *Rattus rattus alexandrinus*



Figure 35: Black Rat *Rattus rattus alexandrinus*

General Description

The subspecies of Black Rat *R. r. alexandrinus*, also known as the Alexandrine Rat, is a slender rat with hairless ears that has a tail equal to its body length and a brown fur coat with a creamy white belly. In tropical climates breeding takes place all year round, and the rat can have five or six litters depending on food availability. However, in temperate climates breeding usually takes place in spring and autumn with one litter of between 5-8 young. An omnivorous species that will feed on almost anything, the rats on the Upper Rock are arboreal and feed mainly on fruit and seeds. They are mainly nocturnal, highly agile and arboreal and can be seen foraging at dusk in the late spring and summer.

Global Distribution

A native of the Indian sub-continent, the Alexandrine Rat was historically introduced as an unsuspecting passenger on sailing ships around the world and can now be found in all temperate and tropical coun-

tries of the world.

Local Distribution

Generally found around Gibraltar outside urban areas in well vegetated zones, with denser populations associated where food availability is greater, in particular the refuse compound at Hole in the Wall, Barbary Macaque feeding areas on the Upper Rock, tourist sites, and Feral Cat feeding points.

Threat

The Black Rat has directly caused or contributed to the extinction of many species of wildlife including birds, small mammals, invertebrates and plants, especially on small islands. The Alexandrine Rat is included in the World Conservation Union's (IUCN) 100 world's worst invaders.

Small populations of this species in Gibraltar pose no threat to biodiversity. However on occasions, due to a substantial food source, breeding success is increased and populations can explode. In such cases infestations result that affect human habitation and property, as is the case at the tourist sites of Jew's Gate, St. Michael's Cave and the Upper Galleries. It can also affect the natural environment with predation on breeding birds and their chicks. *R. r. alexandrinus* has also been known to strip bare the cones of pine trees (*Pinus spp.*) in search of pine nuts, depleting the natural seeding capability of this species.

In the past infestations have been addressed by the Environmental Health Department, now the Environmental Agency, who have used rodenticide poisons to control the species. This practice is indiscriminate and poison can be ingested by other animals. This is totally unacceptable within a Nature Reserve. Furthermore, the rat is a prime prey item of many raptors and owl species that would die if they ingested poisoned rats.

Action

Rat infestations in Gibraltar should be tackled in an environmental friendly manner using non-toxic products and methods. At the moment the main chemicals used against rodents are anticoagulant rodenticides, which inhibit the vitamin-K cycle, preventing blood clotting and causing death from internal bleeding. Warfarin, difenacoum and bromadiolone are now the most widely used chemical compounds in rodenticides. These can be dangerous to humans (particularly children) and when used in suburban areas and the Nature Reserve can impact non-target species. Mammals such as rabbits are just as likely to ingest the cereal-based bait. Anticoagulants have long biological half-lives, so predators may be especially vulnerable as residues from each contaminated prey item accumulate in the liver.

Environmentally friendly control methods, only targeting the pest species should be used. Amongst these methods are:

- Live-trapping cages.
- Glue boards.
- Non-toxic baits.

Live trapping cages come in several forms that will trap single or multiple numbers of the target species. Baited glue boards will attract a number of individuals that will become stuck, struggle and eventually die. These two methods will require regular monitoring to eliminate the contents, but will provide an insight into the extent of the infestation.

Non-toxic baits, in particular EradiRat®, contain no poisonous chemicals and are based on ground maize combined with wheat and a sweet molasses attractant that will obstruct the digestive system and kill the pest without posing a threat to its predators. The product ensures that there is:

- no risk to children or pets.
- no risk to livestock or pets.
- no risk of either primary or secondary poisoning, i.e., predator-friendly.
- no known resistance.
- no special needs for transport, handling storage or disposal.
- No risk of contamination to crops or food
- No risk of environmental pollution – fully biodegradable.

This product can be used virtually anywhere without any danger to the public and the environment and does not require monitoring, for the rat will retreat and die in its burrow and the remaining unconsumed bait is fully biodegradable (Ilex Organics Ltd).

The product is recommended by the Barn Owl Trust of the United Kingdom and is approved by the UK Health and Safety Executive under The Control of Pesticides Regulations 1986.

Further Reading:

- Major, H. L., & Jones, I. L., (2002) *Impacts in the Norway Rat on the Auklet breeding colony at Sirius Point, Alaska in 2002.*
- Olkowski, W., Daar, S. and Olkowski, H., Taunton Press, (1991) *Common-Sense Pest Control: Least-toxic solutions for your home, garden, pets and community.* Rats: 626-637., Mice: 287-294.

Class: **Mammalia**

Order: **Carnivora**

Family: **Felidae**

FERAL CAT
Felis catus



Figure 36: Feral cats feeding outside St. Michael's Cave.

General Description

Feral cats are the 'wild' offspring of domestic cats that have strayed and settled in the wild, and are primarily the result of pet owners' abandonment or failure to spay and neuter their animals, allowing them to breed uncontrolled. A breeding pair can rear two or more litters a year.

Global Distribution

Cats were introduced to most parts of the world with the first European settlers, travelling as pets on board ships and escaping to establish feral populations. Many islands in the Pacific, including the Galapagos have been plagued by the species. They are also found on the mainland of Australia and New Zealand, North America, Europe, Asia and Africa.

Local Distribution

Found everywhere in Gibraltar, with population hotspots around the North Mole, North Front Cemetery, the east side reclamation area and Catalan Bay opposite the Caleta Hotel, Sandy Bay, Camp Bay, Little Bay, the Alameda Gardens and within the Upper Rock Nature Reserve in the vicinity of St. Michael's Cave, the Cable Car top station and the Great Siege Tunnels.

Threat

The feral cat problem was aggravated by the disbanding of the cat and dog control unit of the Gibraltar Government's Environmental Health Department when this entity was privatised. Since then, cat infestations are only tackled when there is a potential or existing human health implication. Cats are then trapped and exterminated.

The problem is further compounded by well-wishing members of the public who constantly feed these feral cats at locations including those mentioned above. The establishment of the Cat Welfare Society, who undertook to rescue abandoned cats back in the late 1990s, was a respite, but the numbers escalated to unmanageable proportions. In the early 2000s the Society established a programme to spay and neuter

the wild feral population in collaboration with the Veterinary Clinic. This effort to control the rising population is to be applauded, but many individual feral cats were not trapped and litters of kittens have frequently been seen in most of the problem locations. It did not stem the existing large population of feral cats and despite their efforts a culling programme is inevitable.

The Feral Cat is responsible for more species extinctions worldwide than any other animal, with the exception of man. It is included in the World Conservation Union's (IUCN) list of 100 world's worst invaders and has a terrible impact on wildlife. Cats are totally carnivorous, preferring to take live vertebrate prey such as mammals, lizards, and snakes and preying extensively on landbirds.

Home ranges of feral cats searching for food are quite extensive (Fitzgerald & Karl, 1986) and they have been seen everywhere within the Upper Rock Nature Reserve and well away from the traditional feeding areas. Indeed, in recent years feral cats have become widely visible on nocturnal visits to the Nature Reserve when carrying out nightjar and owl surveys, and have been seen taking wild birds, including migrants (pers. obs.).

Populations of the Barbary Partridge and Rabbit are at risk and are easy targets for these animals.

Action

A Feral Cat control programme needs to be established as a priority. In particular, the populations within the Upper Rock Nature Reserve need to be eliminated. It is totally unacceptable to have resident populations of feral cats within the Nature Reserve. A control programme should include the following:

- Identify the feral cat population hotspots.
- Establish control procedures using live trapping with cages or leg-hold traps.
- Engage the collaboration of the Veterinary Clinic to put down the animals humanely.
- Establish an eradication programme for the Upper Rock Nature Reserve.
- Outlaw the feeding of Feral Cats in public areas.
- Outlaw the release of pet cats into the wild.
- Public awareness campaign on the Feral Cat problem.

This should be followed by constant monitoring of all affected areas in Gibraltar, to ensure that Feral Cat populations remain under control.

Further Reading:

- **Animal Welfare Advisory Committee (NSW) (1993)** position paper for the control of cats in Australia (unpublished).
- **Dards, J.L. (1979)** *The population ecology of feral cats (Felis catus L.) in Portsmouth Dockyard*. Unpublished Ph.D. thesis, University of Bradford.

Class: **Mammalia**

Order: **Artiodactyla**

Family: **Bovidae**

FERAL GOAT *Capra hircus*

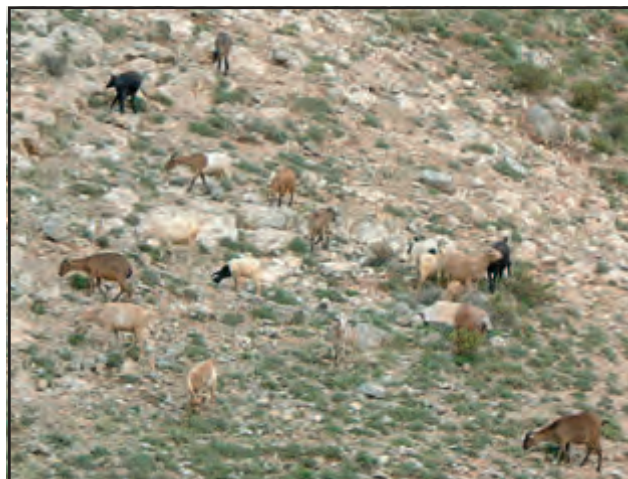


Figure 38: Feral goats foraging on a hillside in Morocco. (J. Cortes).

General Description

Males of this species are large animals, weighing around 45-55kg. They sport a strong set of spiral horns with an anterior keel, and are bearded and have a strong smell during the breeding season. Females are smaller and weigh approximately 25-35 kg. Both are variable in coloration with black and brown, straggly, patterned, hairy coats.

Global Distribution

Most likely descended from *Capra aegagrus* from Central Asia. Since the domestication of the species, goats have been introduced to all continents except Antarctica, and to many offshore islands.

Local Distribution

Imported illegally as a small herd of approximately 10 animals that roamed the Lower Slopes behind the Calpe area, Feral Goats can now be found in two separate herds; one that roams around the Rock Gun and Middle Hill area numbering around 15 individuals and another frequenting the area of Royal Anglian Way and below the Ape's Den, numbering around 20 individuals.

Threat

Goats have been recognised as being the single most destructive herbivore introduced to islands in the world (King, 1985). The introduction of goats has resulted in severe impacts from overgrazing, often leading to ecosystem degradation and biodiversity loss (Coblentz, 1978; Schofield, 1989; Moran 1996; Descender *et al.* 1999). Goats roam about in groups that can build up to large herds.

In Gibraltar the goats are having a negative impact on the indigenous flora severely overgrazing native herbs, grasses, trees and shrubs, and causing extensive erosion around the cliff areas of Royal Anglian Way, below the Apes Den and the Rock Gun area. These can lead to rockfalls.

The Feral Goat must be eliminated from Gibraltar.

Action

The establishment of an eradication programme for the elimination of the feral Goat is an urgent priority.

There are several methods that can be applied to eliminate goats amongst which are:

- Shooting the herds in designated safe areas.
- Trapping the herds in wet weather in shelters.
- Setting noose traps.

Shooting can only be carried out under licence and with the permission and approval of the authorities in compliance with health and safety regulations, in areas that are designated safe and at an hour of the day, preferably dawn and early morning, when there will be less likelihood of human presence. GONHS has already investigated this possibility and has sought and received approval for the culling of the species using this method.

The trapping of goats utilising wire nooses set along the goats' pathways is also a feasible method. The traps would need to be frequently inspected to dispose of any animals caught.

Goats seek shelter in wet weather. They have been known to use some of the old gun batteries in Royal Anglian Way in adverse weather conditions and could be trapped within these.

In drought conditions goats tend to drink more and stay closer to water. This behaviour could prove useful when locating and trapping or culling the species, as they would frequent the Macaque watering sites.

Further Reading:

- **Clarke, G. M., (2000)** *Environmental pest species in Australia. Internal report.* Department of the Environment and Heritage, Canberra.
- **Coblentz, B.E. (1978)** The effects of feral goats (*Capra hircus*) on island ecosystems. *Biological Conservation*, 13: 279-286.
- **Coblentz, B.E. (1980)** Effects of feral goats on the Santa Catalina Island ecosystem. In: D.M. Power (Ed.) *The California Islands: Proceedings of a Multidisciplinary Symposium*, pp. 167-170. Santa Barbara Museum of Natural History, Santa Barbara.
- **Coleman, J., (1995)** Baits and Baiting Strategies for Goats, Pigs and Cats. *Science for Conservation II*. Department of Conservation, Wellington.

- **Descender, K., Baert, L., Maelfait, J., & Verdyck, P., (1999)** Conservation on Volcan Alcedo (Galapagos): Terrestrial invertebrates and the impact of introduced feral goats. *Biological Conservation*, 87: 303-310.
- **Moran, R.V. (1996)** *The flora of Guadalupe Island, Mexico*. Memoirs of the California Academy of Sciences 19, California Academy of Sciences, San Francisco, CA.
- **Schofield, E. K., (1989)** Effects of introduced plants and animals on island vegetation: Examples from the Galapagos Archipelago. *Conservation Biology*, 3: 227-238.

Class: **Aves**

Order: **Columbiformes**

Family: **Columbidae**

FERAL PIGEON
Columba livia (domest.)



Figure 37: Feral Pigeon *Columba livia* in the town area.

General Description

Feral pigeons are the domesticated descendants of the wild Rock Dove, *Columba livia*. The Rock Dove is a plump grey bird with black wing-bars and a white rump or lower back. It has a red iris and a purple breast with green sheen on the sides of the neck. Domesticated pigeons occur in a variety of colours. Domestication has led to a high annual reproductive success, sometimes breeding throughout the year, and pigeon feeding has led to the huge success of the species in our towns and cities.

Global Distribution

A cosmopolitan species that can be found worldwide close to human habitation.

Local Distribution

Feral pigeons have increased in Gibraltar in the last 20 years as the result of an upsurge in the keeping of these domesticated birds in captivity. There were always small pigeon coops in Catalan Bay, the Moorish Castle Estate and the Upper Town bordering the Lower Slopes where many chicken coops were also kept. As a result many escaped domesticated pigeons have begun breeding in recesses, lofts, church towers and tall buildings all over the town area. They have also invaded and taken over the traditional cliff nesting sites of sensitive species of birds like the endangered Lesser Kestrel and the Little Owl.

Found mainly around the town area and in the south district residential areas, the Feral pigeon has also become established on the North Face of the Rock and the east side cliffs above Camp Bay.

Threat

There is an excellent but shocking quote taken from the Tamside Council website information sheet on the Feral Pigeon that states that 'Pigeons carry significantly more diseases that are harmful to humans than rats, and yet we wouldn't think of feeding a rat'.

The biggest threat of close contact with the Feral Pigeon comes from the implications of the avian influenza virus H5N1 being contracted by these birds and transmitted to humans. In 2002 a dead Feral Pigeon was discovered with the H5N1 virus (Ellis et al. 2004), and allegedly hundreds of dead pigeons in Thailand were found to have HPAI H5N1 (Anon 2004, FAO 2005). However, with only two recorded instances of infection and only one confirmation of the disease, the Feral Pigeon cannot be considered as a serious threat to human health for the moment (Feare, 2005).

There are also other threats that feral pigeons can bring:

- Health threat, including 40 diseases that can be passed onto humans.
- Potential diseases that can be transmitted to wild birds.
- Damage to structures, buildings and heritage through constant fouling with droppings.
- Invading and taking over nesting sites of wild bird species, including Little Owl, Lesser Kestrel, Common and Pallid Swifts and House Sparrows.
- Soiling and nitrification of areas around nest sites affecting indigenous flora.

It is obvious that the impact of the Feral Pigeon on Gibraltar's biodiversity is serious. Already, known nesting sites of the Little Owl in recesses in the Tower of Homage were lost in the late 1980s due to a takeover by this pest species. In the 1990s, as the population of the pigeons grew, nesting sites of the Lesser Kestrel on the North Face cliffs of the Rock were occupied by this species. Partly as a result of this the Lesser Kestrel, an endangered species for which a species action plan is included, declined substantially. Crevices on the east side cliffs, potential nesting sites for the Little Owl, have also been occupied.

The problem will continue to escalate as long as the feeding of these birds continues. The problem is a sociocultural one, for as long as the pigeon feeders continue their practice, the population growth of this pest species will continue unabated. The authorities are worried about this problem as members of the public have already expressed their concern in several letters in the press.

Due to the spread of the avian influenza virus to Europe, the Feral Pigeon has been identified by the Avian Flu Civil Contingencies Committee as an urgent target. If the H5N1 virus increases its host range to include passerines, pigeons and game birds, then activities such as cage bird shows, racing pigeons and keeping pigeons will need to be evaluated (Feare, 2005).

Action

Several factors need to be taken into account when addressing the methods and criteria for the control and management of this pest species, amongst which are:

- Assessment of the problem, through the identification of nesting and roosting sites.
- Targeting of those sites identified with a series of protection and eradication methods.
- Targeting the problem outside the breeding season of wild birds.
- Preventing access to recesses in buildings with netting.
- Protecting ledges with specially designed spike strips or sloping ledges.
- Preventing access to food.
- Outlawing the feeding of the species in public places.
- A public awareness campaign of the dangers and health hazard of this pest.

The use of poisoned or stupefying baits is totally unacceptable as this is an indiscriminate method that can be ingested by wild bird species and other animals as well.

A cull of pigeons began in early 2006 in an attempt to reduce the threat of avian influenza were it to arrive in Gibraltar. There was considerable success in the first few months. Subsequently the difficulty in accessing pigeons at nesting or roosting sites (as opposed to feeding areas where they are trapped), and the continuation of feeding by the public reduced the rate of decrease. Culling has proved an ineffective method in many parts of the world (Haag-Wackernagel, 1992), for the population is soon re-established and exceeded after a short time as breeding pairs are quickly replaced by young birds. In isolated areas, however, where culling has been accompanied by a cessation of feeding, the method has been successful.

Breeding success is related to food availability, and pigeons can rear up to 10 chicks a year with an abundant food supply. Reducing that supply will result in a lower breeding success rate and even failure. It is important that legislation banning feeding of pigeons be enacted and enforced.

Ultimately the most successful control method will be a serious public awareness campaign together with a restriction or total ban on the feeding of pigeons, accompanied with culling.

Further Reading:

- **Feare, C. J., (2005)** *Conservation Implications of Avian Influenza*. RSBP Report No. 14.
- **Haag-Wackernagel, D., (1992)** *Regulation of the street pigeon in Basel*.
- **Haag-Wackernagel D, Spiewak R. (2004)** Human infestation by pigeon fleas (*Ceratophyllus columbae*) from feral pigeons. *Ann Agric Environ Med*; 11: 343-346.

Class: **Aves**Order: **Charadriiformes**Family: **Laridae****YELLOW-LEGGED GULL***Larus michahellis*

Figure 39: An adult Yellow-legged Gull *Larus michahellis*. (C. Perez)

General Description

Once considered a subspecies of the Herring Gull *Larus argentatus*, the Yellow-legged Gull is actually a closer relative of the Lesser-blacked Gull *Larus fuscus*, and has been given full species status. The Yellow-legged Gull is a large white gull with a pale grey back and mantle and black tips to the wing. Their legs are yellow, differentiating them from similar sized species with pink legs. The iris is yellow with a red orbital ring and the bill is strong and heavy, coloured orange yellow with an extensive red spot near the tip of the lower mandible. Juveniles and immatures are mottled brownish and do not attain full adult plumage until their fourth year. Breeding takes place in the spring, with nests located mainly on cliffs and open ground. Adults rear a clutch of three birds on average. Chicks are mainly fed on fish, but outside the breeding season the species feeds on eggs, birds, fish, and carrion and is often seen at refuse tips. The birds depart at the end of the breeding season in mid July, and disperse north and south along the Atlantic coast and north up the Mediterranean coast, returning in early October.

Global Distribution

Mainly found in the western Mediterranean basin and the Atlantic coast of Iberia.

Local Distribution

Not recorded as breeding by Irby (1876), the bird was confirmed as breeding by Rait-Kerr in 1934 (Cortes *et al.* 2004). It is now found extensively in all habitats, including urban areas, and is Gibraltar's most common bird.

Threat

Irby had not recorded the bird as breeding but it must surely have been present as a scavenger in the port area and surrounding waters of the Bay and Strait. In the early 1970s several hundred pairs were recorded, breeding mainly on the upper reaches of the Rock. Since then the increased human activity and population expansion that has taken place in the hinterland, increased commercial fishing activity in the ports of Algeciras and La Linea and the growing number of refuse tips have resulted in a population explosion of this species to pest proportions.

These numbers are affecting the local biodiversity and having an effect on the ecosystem as a whole in Gibraltar. They also harass birds of prey on migration, in particular Griffon Vultures *Gyps fulvus* and Short-toed Eagles *Circaetus gallicus*, and occasionally drive them into the sea where they drown. Local nesting birds also suffer from the continual harassment of the Gulls, which tend to take over all suitable nesting sites.

The native flora is also affected in various ways. Nesting sites are located on open ground and cliff ledges, a habitat that is preferred by many of Gibraltar's rare species of plant. Nesting material is composed of small tufts of grass and plants that are ripped out by the gulls. The guano of the gulls around the main nesting areas is thought to be changing the pH and nitrifying the soil, increasing the colonisation capability of other plants to the detriment of many of the rare native species adapted to local conditions.

Gull infestation has also had a negative effect on humans through the soiling of structures, buildings, cars and clothes on washing lines, and nesting of the species in urban areas on roofs and balconies. They attack people during the nesting season and while they rarely cause injury, their aggression can cause fright and even panic.

Action

A comprehensive history and analysis of the Gull Cull situation can be found in Perez & Bensusan (2005), and suggests that there is a need to analyse the gull cull strategy of the last decade in order to prepare the ground for the next 10 years.

This analysis is mainly based on the paper by Cortes *et al.* (2004) 'The Control of the Yellow-legged Gull in Gibraltar', which deals with the matter more thoroughly.

The present Gull Cull contract has been successful initially in reducing the rate of increase of the population and currently in maintaining the present population stable. Amongst the recommendations that will improve the present situations are:

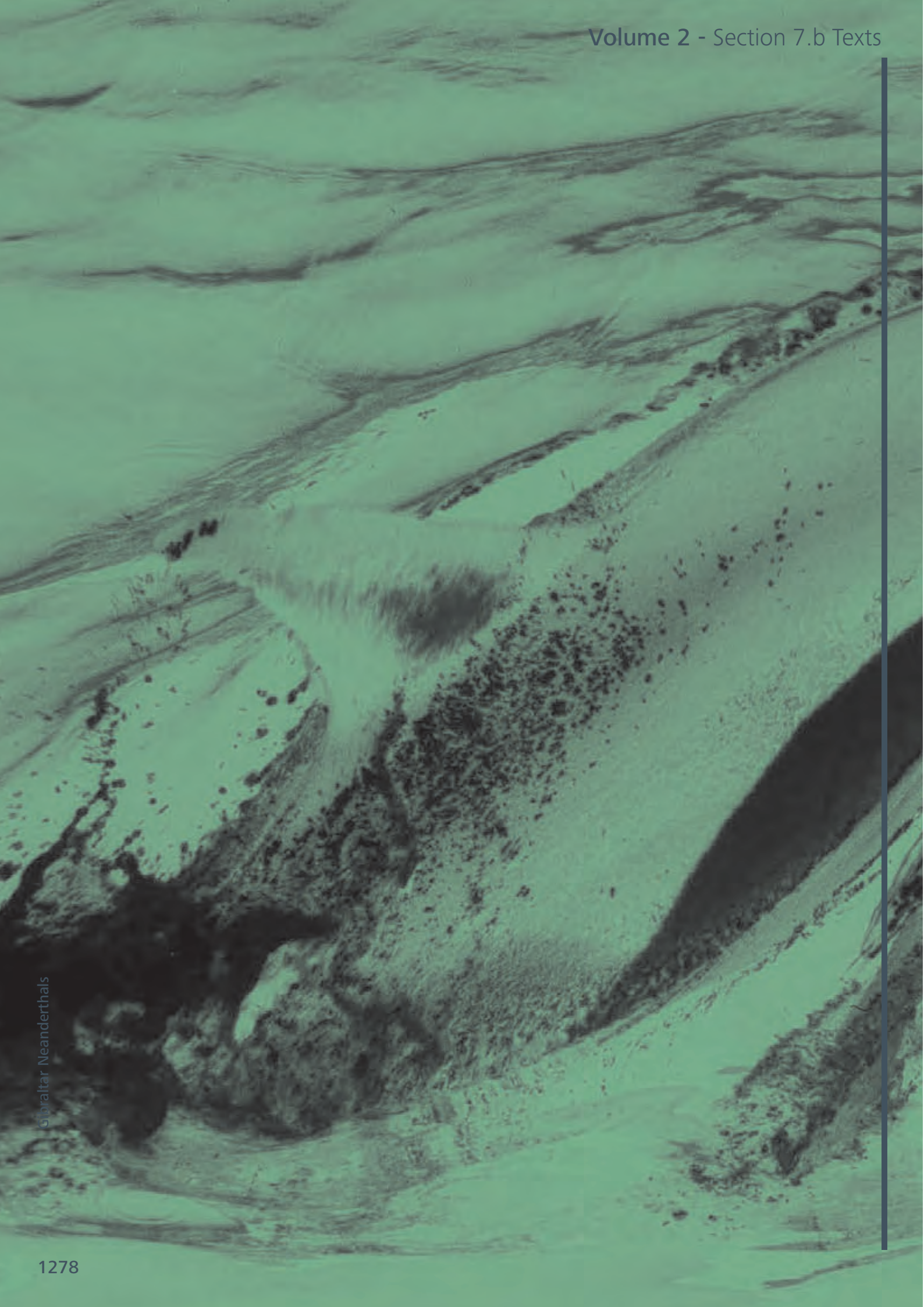
- An increase in the manpower of the Gull Cull Unit, especially during the breeding season.
- Specific targeting of adult birds.
- Tackle the removal of nests in urban areas separately, as this takes considerable effort for little return, although receiving public appreciation and support.
- Increase disturbance at breeding sites through the use of raptors of the Bird Rehabilitation Unit.
- Increasingly utilise the resources of the Cliffs and Caves section of GONHS to tackle inaccessible areas.
- Apply the fox re-introduction programme to other localities of the Upper Rock, including the Great Sand Slopes, Lower Slopes and Northern Defences area.

A reduction of available feeding sites would drastically reduce the population and breeding success of the gulls. However, unlike the Feral Pigeon, control of feeding sites of this species is virtually impossible since they forage far afield in rubbish tips many miles away, returning to the Rock in the evenings. Securing rubbish deposition areas to prevent the gulls ripping plastic bags open, ensuring that school playgrounds are left clean after playtime, and any other food access prevention methods would certainly improve the situation, and reduce aggression of this species towards humans.

Finally, because of the wide-ranging habits of the species, measures in Gibraltar should form part of a wider regional strategy.

Further Reading:

- Cortes, J. C., Shaw, E., Blair, M., Candelin, G., (2003) The Control of the Yellow-legged Gull, *Larus michahellis*, in Gibraltar. *Almoriana*. 31. pp199-216.
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7. References & Glossary

Gibraltar Neanderthals

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Glossary

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area
Bern Convention	Convention on the Conservation of European Wildlife and Natural Habitats.
Biodiversity Convention	The Rio de Janeiro Convention on Biological Diversity 93/626/EEC also known as the CBD
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals 82/461/EEC also known as CMS.
CBD	Convention on Biological Diversity
CITES	The Convention on the Trade in Endangered Species of Wild Flora and Fauna
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CoP	Conference of Parties
cSAC	Candidate Special Area of Conservation
DEFRA	Department for Environment, Food and Rural Affairs
DPC	Development and Planning Commission
EEA	European Environmental Agency
EEC	European Economic Community
EC Birds Directive	Council Directive 79/409/EEC on the Conservation of Wild Birds
EC Habitats Directive	Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora
EIA	Environmental Impact Assessment
EMAS	the Eco-Management and Audit Scheme
Emerald Network	Areas of Special Conservation Interest' set up by Council of Europe under Bern Convention
EU	European Union
EUROBATS	The Agreement on the Conservation of Populations of European Bats
GISP	Global Invasive Species Programme
GONHS	Gibraltar Ornithological & Natural History Society
GTI	Global Taxonomy Initiative
HMSO	Her Majesty's Stationary Office
IBAs	Important Bird Areas
IPCC	Intergovernmental Panel on Climate Change
IUCN	World Conservation Union
JNCC	Joint Nature Conservancy Council
L/N	Legal Notice
MEAs	Multilateral Environmental Agreements
MoD	Ministry of Defence
Natura 2000	European Union-wide network of nature conservation sites established under the Habitats Directive.
NGO's	Non-governmental Organisations
OTA	United States Office of Technology Assessment
SAC/SaC	Special Area of Conservation
SPA	Special Protection Area
SPEC	Species of European Conservation Concern
World Heritage Convention	The Convention concerning the Protection of the World Cultural and Natural Heritage



**The Gibraltar Ornithological
and Natural History Society**

Jews' Gate,
Upper Rock Nature Reserve,
PO Box 843, Gibraltar.
Email: info@gonhs.org
www.gonhs.org

Environmental Action & Management Plan 2013

Environmental Action & Management Plan



Globetrotter Neanderthais

Gibraltar Neanderthals

Cover page: View of the Eastside from Douglas Path, Leslie Linares ARPS

Table of Contents

Introduction	5
1: Air Quality.....	8
2: Water Resources.....	9
3: Natural Habitats.....	11
4: Energy.....	13
5: Green Buildings.....	15
6: Traffic & Transport.....	19
7: Development & Planning.....	21
8: Waste Management	25
9: Climate Change and other global challenges.....	27
10: Industrial Activities & other Environmental Nuisances.....	30
11. How will the Government achieve the implementation of this plan?.....	34
11.1 Public Sector.....	34
11.2 Private Sector	34
11.3 Costs & Financing.....	35
11.4 Review	35



Introduction

The Government of Gibraltar is committed to the creation of a sustainable future for Gibraltar in which all citizens can enjoy a rich, diverse and healthy environment. It has adopted a green ethos which places the environment at the heart of all decision making.

This Environmental Action & Management Plan (EAMP) serves as the road map for the implementation of these green principles. It establishes general policy goals, identifies specific action points and sets out tentative timeframes for the achievement of these goals.

Key issues addressed in the EAMP include:

- The living environment (constituting the natural and urban environment);
- The link between sustainable development and human health;
- Strategies for the sustainable development of our living environment as well as nature conservation and management;
- The need to incorporate environmental considerations into all policy decisions;
- Recognition of Gibraltar's unique circumstances and the need for environmental policy and decision making to be tailored to these.

The role of the EU

Europe's environmental policy was established in 1973, following the 1972 UN Conference on Environment, which addressed the public and scientific concerns about the "limits of growth". In 1987 environmental protection objectives and principles were given their own chapter in the EC Treaty and in the Treaty establishing the European Union. Today, the vast majority of Gibraltar's national environmental laws and policies have their origins in EU law.

Articles 191, 192 and 193 of the Treaty for the European Union relate to the EU's environmental policy. Article 191 describes the aims and principles of this policy and demands a high level of protection for the environment, whilst allowing for regional differences. Article 192 contains the real legal basis for measures and governs the

decision-making process for their coming into being. Article 193 allows Member States the option to take or maintain more stringent measures than those prescribed by EU legislation

Gibraltar Environmental Policy & Legislation

Gibraltar's own position towards the environment has changed considerably over the years. Initially based on the 1950 Public Health Act, Gibraltar now boasts a whole host of environmental legislation on issues such as air quality, bathing and water quality, waste management, renewable energy and energy efficiency. Most of these have been driven by their equivalent EU Directives. This is also true of the Habitats and Wild Birds Directives which have been transposed and which, in conjunction with the measures included in the 1991 Nature Protection Act, serve to protect, maintain and enhance our natural environment.

The Ministry for the Environment was established in the early 1990s and has grown considerably since its inception. This reflects the multifaceted nature of environmental management and the fact that it is an area which continues to grow in importance. This growth has been particularly valid in 2012 as the environment now features much more prominently in all Government policy and activity.



Gibraltar Neanderthals

1: Air Quality

Gibraltar faces significant challenges in improving ambient air quality due to its small size and the fact that all activity takes place within a limited area. It must contend with emissions from vehicles, older industrial facilities as well as transfrontier air pollution. Gibraltar has an air quality monitoring programme which allows it to monitor compliance with EU Directives on air quality.

The Government has already taken steps to expand this programme and remains committed, not only to ensuring that all target emission levels are complied with, but that Gibraltar achieves the best possible ambient air quality.

Goal: To continue efforts to obtain tangible air quality improvements with the overall goal of going beyond minimum compliance with the Clean Air for Europe emission target values.

Actions:	Timescale
<ul style="list-style-type: none"> Expand and improve the current air quality website to ensure greater user friendliness www.gibraltairairquality.gi 	2012 (completed)
<ul style="list-style-type: none"> Post 'No Idling' signs at the frontier and other locations where idling is prevalent 	2013
<ul style="list-style-type: none"> Enforce law on fuel switching within EU ports to reduce emissions from shipping 	2014
<ul style="list-style-type: none"> Discourage the use of 2-stroke motorcycles 	2014
<ul style="list-style-type: none"> Stop operation of existing power stations. The new power station will apply the principles of BAT (Best Available Technology) in accordance with best practice. 	2015
<ul style="list-style-type: none"> Focus on alternative transport in order to reduce emissions from vehicles (see Transport section for more details) 	Ongoing

Goal: To expand the current air quality monitoring programme

Actions:	Timescale
<ul style="list-style-type: none"> Commence monitoring of black carbon 	2013
<ul style="list-style-type: none"> Develop method for quantification of African Dust intrusion 	2013
<ul style="list-style-type: none"> Install and operate a rain gauge at the Rosia Road monitoring station 	2013

2: Water Resources

Gibraltar is largely surrounded by sea which is a crucial part of our natural habitat. The Gibraltar River Basin District Management Plan sets out the framework within which the quality of our ground and coastal waters will be monitored and improved.

Goal: To continue to monitor, maintain and enhance the quality and ecological integrity of our ground and coastal waters

Actions:	Timescale
<ul style="list-style-type: none"> Appropriate sampling at all pollution incidents in order to establish causality and enforce the polluter pays principle 	Ongoing
<ul style="list-style-type: none"> Implementation of a robust licensing and payment regime for all discharges into the aquatic environment. 	Ongoing
<ul style="list-style-type: none"> Expansion of marine coastal water quality sampling programme 	2013
<ul style="list-style-type: none"> Revision of bathing water standards 	2014
<ul style="list-style-type: none"> Introduction of beach signage 	2013
<ul style="list-style-type: none"> Development of urban wastewater treatment plant 	2015
<ul style="list-style-type: none"> Maintenance and enhancement of stormwater and sewage infrastructure to minimise environmental degradation 	Ongoing
<ul style="list-style-type: none"> Strict implementation of the Polluter Pays Principle 	Ongoing
<ul style="list-style-type: none"> Monitoring groundwater in the Northern Isthmus and bedrock aquifers 	Ongoing



3: Natural Habitats

‘Biodiversity’ is a term that refers to the range of species, habitats and ecological systems that make up the living earth. It has a local, regional and global importance and is of great value to humanity. Biodiversity can also provide direct economic benefits for forestry, fisheries, agriculture and tourism. Healthy ecosystems are essential for water, land and air quality, climate generation, and the cycling of nutrients and natural waste products. Biodiversity is also significant to recreational and cultural activities.

Biodiversity management is an important part of Gibraltar’s responsibilities under the Nature Protection Act and the EU Birds and Habitats Directives which are designed to provide long-term protection for networks of species and habitats. Gibraltar seeks to develop a thriving wildlife population with the improvement and extension of habitats for the benefit of all species and to create widespread recognition of the importance of safeguarding biodiversity and protecting wildlife.

Goal: The protection and enhancement of the Upper Rock and the Southern Waters of Gibraltar as terrestrial and marine nature reserves

Actions:	Timescale
<ul style="list-style-type: none"> • Designation of Upper Rock as a Special Area of Conservation (SAC) 	2012 (completed)
<ul style="list-style-type: none"> • Development and implementation of the Rock of Gibraltar Management Plan and the Upper Rock Management Plan 	2013
<ul style="list-style-type: none"> • Revision and implementation of Southern Waters Management Plan 	2013
<ul style="list-style-type: none"> • Introduction of licensing regime for fishing, diving and other marine activities 	2013
<ul style="list-style-type: none"> • Revision of Nature Protection Act 	2013
<ul style="list-style-type: none"> • Research for EU Marine Strategy compliance purposes 	2013
<ul style="list-style-type: none"> • Habitat surveillance monitoring and data management 	Ongoing
<ul style="list-style-type: none"> • Protection and enhancement of habitats and biodiversity 	Ongoing
<ul style="list-style-type: none"> • Implementation of wildlife management plans including Biodiversity Action Plan 	Ongoing



4: Energy

Energy use is the main contributor towards the accelerated process of climate change. Gibraltar’s growing energy demands have led to increased combustion both from electricity generation and transport, both of which contribute greatly to atmospheric carbon dioxide as well as other pollutants. In Gibraltar, water consumption is a large contributing factor to our overall energy demand due to the nature of the reverse osmosis process. Consequently energy reduction measures need to also encompass water saving measures to achieve the greatest impact.

Reducing our energy demands as well as investing in the implementation of energy saving practices throughout society can achieve significant reductions of emissions as well as reducing costs. Gibraltar has obligations under various EU Directives to reduce its overall energy demand. Using energy more efficiently is the fastest and most cost effective way of cutting carbon dioxide emissions.

Goal: To encourage greater energy efficiency throughout Gibraltar

Individuals and businesses can contribute towards energy efficiency by reducing the amount of energy they use within the home and work place through the use of more efficient products and services as well as by implementing simple behavioural changes. Government will encourage and enable action by businesses and individuals by providing the right information and ensuring that the necessary regulatory framework is in place.

Actions:	Timescale
<ul style="list-style-type: none"> Removal of import duty on LED and other energy efficient lighting 	2012 (completed)
<ul style="list-style-type: none"> Phasing out of inefficient incandescent light bulbs 	2013
<ul style="list-style-type: none"> Awareness campaign on energy and carbon reduction measures for individuals 	2013
<ul style="list-style-type: none"> Revised billing to provide more information to end consumers in a phased approach beginning 2013 	2014
<ul style="list-style-type: none"> Revised electricity and water tariff system to encourage energy saving and penalise excessive energy usage 	2014

Goal: To develop renewable energy sources for Gibraltar

The Government of Gibraltar is committed to the introduction of renewable energy sources. Efforts will focus on solar and ocean currents whilst other, emerging technologies will also be assessed for their local feasibility. Micro-generation will also be encouraged.

Actions:	Timescale
<ul style="list-style-type: none"> • Introduction of pilot schemes for solar power and other viable technologies 	2013
<ul style="list-style-type: none"> • Study of tidal current profiles within British Gibraltar Territorial Waters 	2013
<ul style="list-style-type: none"> • Upgrades to the existing electricity grid to allow for the connection of renewable energy 	2014

Goal: To improve the energy efficiency of the transport sector

Transport is a major energy consumer and as such contributes to air pollution, climate change, noise and other environmental problems. The Government is committed to trying to reduce the amount of unnecessary traffic on our roads and to improving the quality of the bus service, cycle and pedestrian facilities in order to encourage these more sustainable modes of transport.

Actions:	Timescale
<ul style="list-style-type: none"> • Comprehensive Sustainable Traffic, Transport and Parking Study (see Traffic & Transport sector for more details) 	2013
<ul style="list-style-type: none"> • Phased introduction of electric (or other environmentally friendly) buses on all feasible routes 	From 2013
<ul style="list-style-type: none"> • Inclusion of electric vehicle charging points in all new public car parks 	2013

5: Green Buildings

Government, businesses and individuals all have an impact on the environment through the choices they make when renovating existing buildings and constructing new ones. These choices manifest themselves in the quantity and types of energy used, the impact on water quality, the amount of waste created and the quality and quantity of green spaces available.

Goal: To ensure that all future development within Gibraltar meets minimum standards for energy efficiency with the long term aim of moving towards zero or nearly zero-energy buildings.

Gibraltar is already implementing the Energy Performance of Buildings Directive, however, this has been revised and recast with more stringent requirements. Gibraltar is looking to become as energy efficient as possible and reduce overall grid demand. As part of this initiative, the building sector must move towards being zero-energy or nearly zero energy by 2020.

Actions:	Timescale
<ul style="list-style-type: none"> Requirement for all new developments to assess overall renewable energy potential as part of permit conditions 	2012 (completed)
<ul style="list-style-type: none"> Requirement for all new builds to maximise productive roof space by incorporating alternative energy systems (e.g. solar thermal or photovoltaic) or green roofs 	2013
<ul style="list-style-type: none"> Requirement for all lighting designs and installations in new developments or major refurbishments to be energy efficient 	2013
<ul style="list-style-type: none"> Revision of Building Rules to reflect more stringent energy efficiency standards 	2014
<ul style="list-style-type: none"> Establishment of fund for energy efficient home improvements 	2014
<ul style="list-style-type: none"> Provide appropriate training on green building and energy efficient design to public servants in relevant areas 	2014
<ul style="list-style-type: none"> Require design teams for all new developments to include a professional experienced in sustainable development practices at the start of the project and throughout design and construction. 	2014
<ul style="list-style-type: none"> All new construction and renovation of Government buildings will, where feasible, obtain an A rating standard for energy performance. 	Ongoing



Gibraltar Neanderthals

<ul style="list-style-type: none">• Private sector development to be encouraged to meet the same standards	2014
<ul style="list-style-type: none">• Enforcement of the above ensured via increased monitoring and policing of planning and building permit requirements	2014



6: Traffic & Transport

Gibraltar suffers from regular traffic congestion and it is vital that this problem be addressed. The Government will seek to encourage modes of transport that reduce dependence on private vehicles by promoting public transport, walking and cycling.

Goal: To gain a solid understanding of the current situation in Gibraltar with regards to traffic and transport

Before Government can begin to formulate a plan to tackle the problem, it is necessary to understand it in more depth. Information is required on issues such as the existing road network capacity, barriers to non-motorised forms of transport and other key issues.

Actions:	Timescale
<ul style="list-style-type: none"> Comprehensive Sustainable Traffic, Transport and Parking Study 	2013

Goal: To reduce dependence on private vehicles as the primary mode of transport and move towards a culture of “streets for people” that gives precedence to the needs of pedestrians, cyclists and public transport users.

The current traffic problems in Gibraltar contribute to environmental noise and air pollution and decrease quality of life for all residents. These problems have historically been tackled through the creation of more infrastructure but there are limits to Gibraltar’s capacity for growth in this respect, therefore other ways of tackling the problem need to be investigated.

Actions:	Timescale
<ul style="list-style-type: none"> Education of individuals and organisations on the availability of alternative modes of transport that will reduce dependency on single occupancy vehicles. 	Ongoing
<ul style="list-style-type: none"> Implementation of educational programmes such as programmes that encourage children to walk or cycle to school and cycle proficiency schemes. 	2014
<ul style="list-style-type: none"> Work with the Royal Gibraltar Police to offer safety lessons for 	2014

cycling and walking to school to all children of school age.	
<ul style="list-style-type: none"> Based on the results of the Sustainable Traffic, Transport & parking Study, develop initiatives to encourage walking and cycling. 	2014
<ul style="list-style-type: none"> Based on the results of the Sustainable Traffic, Transport & parking Study, develop bus routes that comprehensively serve the needs of the population. 	2014
<ul style="list-style-type: none"> Based on the results of the Sustainable Traffic, Transport & parking Study, develop a holistic and environmentally sustainable parking strategy for Gibraltar. 	2014

Goal: To become a formal participant in European Mobility Week

Actions:	Timescale
<ul style="list-style-type: none"> Organise an “In Town Without My Car” event by setting aside at least one stretch of road reserved solely for pedestrians, cyclists and public transport for one whole day. 	2012
<ul style="list-style-type: none"> Implement at least one new permanent measure each year which contributes to modal transfer from the private car to an environmentally sound means of transport 	2013

7: Development & Planning

Gibraltar’s land use policy must harmonise its built and natural environments to ensure that growth does not jeopardize environmental sustainability and preserves the Rock’s character. The Government’s aim is to develop a holistic planning process which promotes interdepartmental programmes and channels for joint decision making; which prioritises environmental considerations in all aspects of the decision making process and which encourages stronger partnerships with stakeholders, the business sector, agencies, professionals and the general public to ensure greater public awareness and participation.

Goal: To make the planning process more open and transparent and to allow for meaningful consultation with interested parties

The Government hopes to actively promote effective, participative systems of governance in all levels of society, engaging people’s creativity and diversity. Public participation and consultation is a vital part of our development and planning process. It is Government’s intention to continue this process and increase the level of public participation wherever possible.

Actions:	Timescale
<ul style="list-style-type: none"> Development and Planning Commission meetings to be made public 	2012
<ul style="list-style-type: none"> Results of public consultations to be made readily available online 	2012
<ul style="list-style-type: none"> Planning documents for large scale plans/developments to be made available online to facilitate the process of public participation 	2012
<ul style="list-style-type: none"> All Government projects to be subject to the planning process 	2014
<ul style="list-style-type: none"> Greater interdepartmental co-operation on Government projects to ensure that all aspects of sustainability are considered at an early stage of the project development. 	Ongoing
<ul style="list-style-type: none"> Updating of Gibraltar Development Plan 	2015

Goal: To ensure that all new developments in Gibraltar are carried out with due consideration to the environment

Sustainable development needs to focus on the long-term management of our environment, striking the delicate balance between the natural and urban settings and their interdependence in order to ensure that economic development and better standards of living do not come at an unacceptable environmental cost. It needs to respect the limits of our environment and its resources and work towards the improvement of our living environment. A comprehensive understanding of local environmental conditions is critical in this respect.

Actions:	Timescale
<ul style="list-style-type: none"> All planning applications to be passed through the Department of the Environment for comment 	Ongoing
<ul style="list-style-type: none"> Implementation of effective Environmental Impact Assessment (EIA) follow up systems. 	2012
<ul style="list-style-type: none"> Greater interdepartmental co-operation on Government projects to ensure that all aspects of sustainability are considered at an early stage of the project development 	Ongoing
<ul style="list-style-type: none"> Recommendations of Strategic Environmental Assessment of the Gibraltar Development Plan to be taken into consideration when assessing Gibraltar's current and future levels of development 	Ongoing

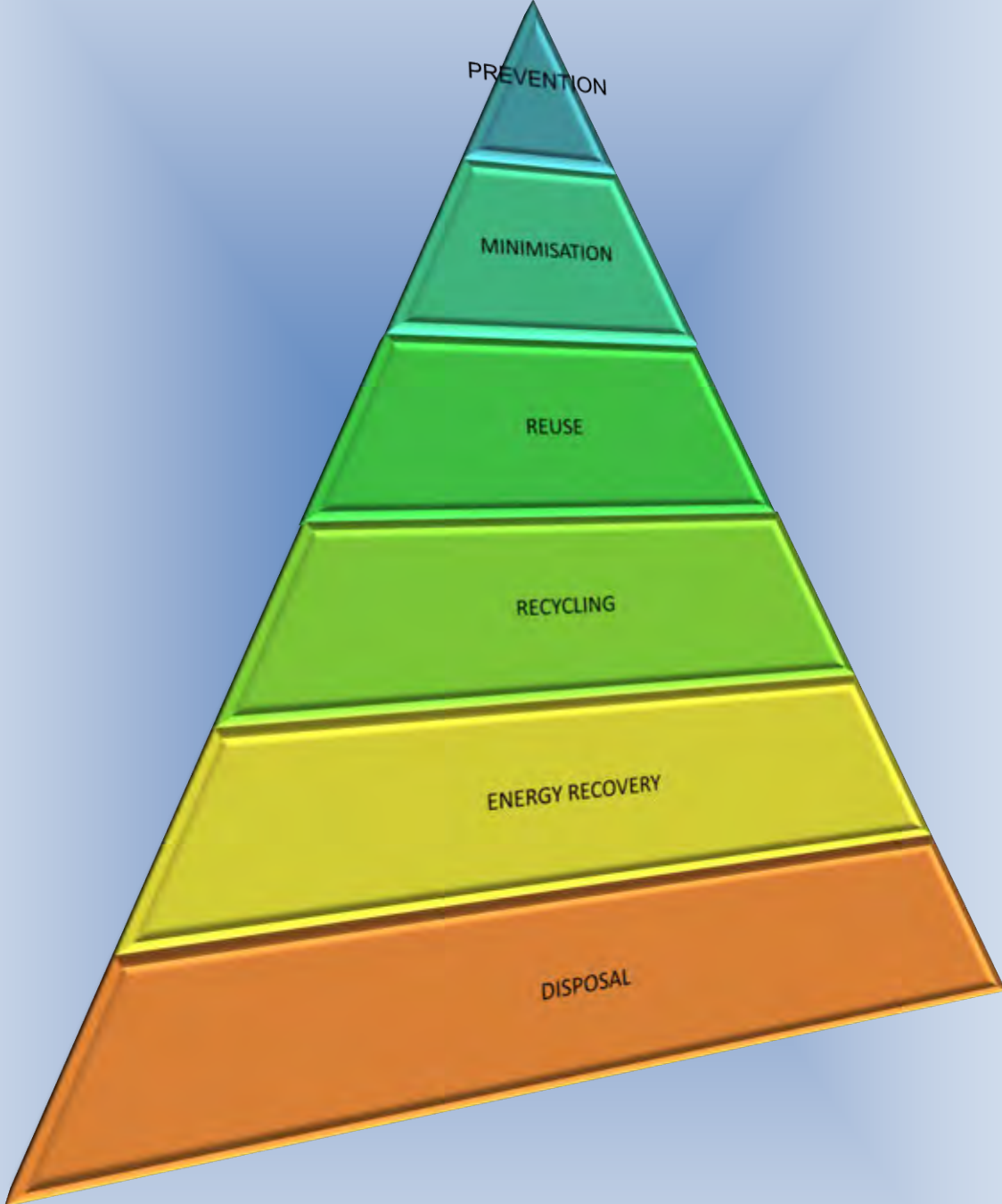
Goal: To ensure that all future development within Gibraltar meets minimum standards for energy efficiency with the long term aim of moving towards zero or nearly zero-energy buildings in the long-term.

See section on "Green Buildings".

Goal: To conserve Gibraltar's natural and built heritage; to promote and maintain green and open spaces wherever possible.

Historically, there has been a presumption in favour of development to the detriment of our natural environment. Government intends to reverse this process and ensure that future development does not compromise our heritage by ensuring that green spaces are promoted and maintained wherever possible and that compensation is provided where this is not possible.

Actions:	Timescale
<ul style="list-style-type: none"> • Tree planting in urban areas will be sustained 	Ongoing
<ul style="list-style-type: none"> • Legislation to be passed ensuring that any new development includes a minimum of 5% total land area as green area. 	2013
<ul style="list-style-type: none"> • Legislation to be passed to the effect that if development results in the loss of green area/open space, compensation for this loss must be included in the development proposal in the form of green/brown roofs or other appropriate measures. 	2013
<ul style="list-style-type: none"> • To create an Environmental Heritage Register which lists all sites or natural icons deemed to be part of our environmental heritage 	2015



8: Waste Management

Gibraltar recognises that the management of waste in an environmentally sustainable manner is a key part of its environmental commitments. The current waste management strategy will be reviewed and all existing waste streams will be incorporated into a holistic plan. Gibraltar will develop its waste management strategy in line with the key EU principles of: reduce, re-use, recycle, recovery and appropriate final disposal.

Goal: To increase recycling rates and reduce the amount of waste sent to landfill

Under the Waste Framework Directive, Gibraltar is required to increase the proportion of household waste that is recycled up to 50% in total. This will require a steep increase in current recycling rates.

Actions:	Timescale
<ul style="list-style-type: none"> Expand the types of materials that can be taken to local recycling points to include paper and plastics 	2012 (completed)
<ul style="list-style-type: none"> Launch an education and awareness campaign to raise local consciousness of the need to recycle 	Ongoing
<ul style="list-style-type: none"> Require recycling at all Government events as a condition of the tender award 	2013
<ul style="list-style-type: none"> Examine the feasibility of establishing penalties for failing to recycle or of offering a recycling incentive 	2013
<ul style="list-style-type: none"> Work with local bars and restaurants to ensure that all glass and cans disposed of within these establishments are recycled 	2013
<ul style="list-style-type: none"> Continue to reuse clean construction rubble for land reclamation projects and consider environmentally acceptable alternatives 	Ongoing

Goal: To reduce the amount of waste produced in Gibraltar

In addition to increasing the amount of waste that is recycled, Government also wishes to see a reduction in the total amount of waste produced locally.

Actions:	Timescale
<ul style="list-style-type: none"> Work with the Chamber of Commerce and the Gibraltar Federation of Small Businesses to discourage the use of plastic 	2013

bags and to encourage the use of reusable bags	
<ul style="list-style-type: none"> Ensure the recycling of all paper, cardboard, ink cartridges, batteries and waste electrical and electronic equipment within all Government Departments, Authorities and Agencies. 	2013
<ul style="list-style-type: none"> Discourage the use of bottled water in Government buildings and at Government functions 	2014

Goal: To ensure proper disposal of all waste streams locally

Actions:	Timescale
<ul style="list-style-type: none"> Set up a well managed and well equipped Eco Park for the disposal of all different waste streams, including waste electrical and electronic equipment and waste oil. 	2014
<ul style="list-style-type: none"> Examine the feasibility of collecting recyclable waste from the kerb side and bin holding areas, as is currently the case for all household waste. 	2013
<ul style="list-style-type: none"> Evaluate alternatives for long term options for the disposal of solid waste and develop a waste management strategy according to the outcomes of this evaluation. 	2013

9: Climate Change and other global challenges

Climate change is becoming an increasing threat to society. Given the high rates of observed emissions of greenhouse gases, the worst case scenarios projected by the Intergovernmental Panel on Climate Change (IPCC) are being realised. Whilst it is recognised that the earth naturally undergoes cycles of warming and cooling, for many key parameters, the climate system is already moving beyond the patterns of natural variability within which our society and economy have developed and thrived.

Gibraltar’s contribution towards the global climate threat is small. However, that does not mean that we are immune to the problems nor that we should not play our part in working towards reducing the threat.

Goal: Adopt targets and establish frameworks for the reduction of greenhouse gas emissions

Gibraltar will reduce its carbon emissions via the implementation of many of the measures already listed in this document under Energy, Green Buildings and Traffic & Transport. In addition, Government will continue to work closely with experts in the Climate Change Forum to develop new policies to combat climate change and adapt to its effects.

Actions:	Timescale
<ul style="list-style-type: none"> Continue to obtain an inventory of greenhouse gas emissions 	Ongoing
<ul style="list-style-type: none"> Develop a new climate change programme and associated action plan 	2013
<ul style="list-style-type: none"> Examine the possibility of developing renewable energy or carbon offset projects in Morocco 	2015
<ul style="list-style-type: none"> Develop a measure of our carbon footprint in order to effectively measure progress and effectiveness of initiatives 	2013

CARBON FOOTPRINT

Gibraltar Neanderthals

Goal: To integrate the consideration of the effects of climate change into long-term planning

The predicted effects of climate change in the Western Mediterranean will consist of rising temperatures, lower levels of rainfall, changes in the intensity and distribution of the rainfall, leading to a subsequent increase in floods. There will be a greater degree of unpredictability in relation to extreme weather events, including wetter winters, hotter, drier summers and heat waves.

Actions:	Timescale
<ul style="list-style-type: none"> All new developments to take into account possibility of minimum sea level rise 	Ongoing
<ul style="list-style-type: none"> Climate Change Forum to continue to monitor international findings on climate change to advise of any further measures. 	Ongoing
<ul style="list-style-type: none"> Participate in European programmes and workshops on climate change adaptation where possible 	2012 onwards
<ul style="list-style-type: none"> Undertake a risk and vulnerability assessment to better understand localised impacts of climate change 	2013

Goal: To assist local communities of flora and fauna to adapt to the impacts of climate change

Changes such as those listed above will have less of an impact on the human population than on populations of flora and fauna. Lower river flows in summer and subsequent decreased discharge of freshwater into the Bay will affect sea temperature and salinity as well as carbon dioxide, nitrate and phosphate concentrations within the marine environment.

Actions:	Timescale
<ul style="list-style-type: none"> Extra watering points to be placed across the Upper Rock Nature Reserve to allow animal communities access to drinking water 	2014
<ul style="list-style-type: none"> Vulnerability assessments to be carried out for habitats and species within the Upper Rock and Marine Nature Reserves 	2014
<ul style="list-style-type: none"> Continued collaboration with relevant bodies to determine best ways of helping these communities adapt to impacts of climate change 	Ongoing

10: Industrial Activities & other Environmental Nuisances

Environmental nuisances can take a variety of forms, from the adverse effects of industrial activity to dust, odour and insects. Noise is also an inevitable consequence of the way we live, comprising both natural and man-made sources. Government will seek to reduce the number of environmental nuisances that the population are exposed to and to mitigate those nuisances which cannot be eliminated.

Noise

In Gibraltar, environmental noise arises mostly from traffic, however, other sources such as the power stations, construction sites, the dockyard and the airport also contribute. An Environmental Noise Steering Group exists to determine how best to reduce these levels.

Goal: To eliminate or reduce levels of environmental noise

Actions:	Timescale
• Reactivate Environmental Noise Steering Group	2013
• New developments to include noise mitigation in design	2013
• Work to reduce levels of noise arising from industrial operations	2013
• Introduction of Noise Bill	2014
• Introduction of fines for vehicle noise nuisance	2014
• Stop operation of existing power plants. New station to include noise abatement technology	2014
• Traffic planning schemes	2015

Bunkering

Bunkering is an important economic activity, however, it is one that has in the past occasioned some public nuisance in the form of foul smells. The problem has been identified and remedial action has been taken by the Gibraltar Port Authority: all incoming bunker cargoes are screened and subject to strict limitations in terms of cargo temperatures and hydrogen sulphide content. In addition, all bunker barges operating in Gibraltar now operate a closed tank procedure.



Government will seek to further improve the situation by implementing an increased inspection regime for vessels in the bunker trade and is already working in close consultation with other Government departments as well as NGOs on these matters.

Goal: To monitor and further reduce the environmental impact of the bunkering industry

Actions:	Timescale
<ul style="list-style-type: none"> Examine the possibilities for moving all fuel storage operations onshore 	Ongoing
<ul style="list-style-type: none"> Continue to work together with Spanish counterparts to effectively manage pollution incidents at sea 	Ongoing
<ul style="list-style-type: none"> Increase in fines for oil spillages and pollution incidents at sea 	2012 (effected)
<ul style="list-style-type: none"> Better coordination between relevant departments when dealing with oil pollution incidents 	2012 (ongoing)
<ul style="list-style-type: none"> Increase number of bunkering inspectors 	2013
<ul style="list-style-type: none"> Prevent bunkering on the East side 	2012
<ul style="list-style-type: none"> Examine possibility of fixed moorings 	2014
<ul style="list-style-type: none"> Revision of oil spill response contingency plan 	2013

Litter

Gibraltar suffers from serious litter problems which include fly tipping, inappropriate waste disposal as well as more general littering of streets by uncaring members of the public. Government is committed to tackling this problem head-on in order to improve the quality of our local environment.

Goal: To reduce littering in urban and natural areas in Gibraltar (including marine and coastal areas)

Actions:	Timescale
<ul style="list-style-type: none"> Set up a litter committee to deal with the issue of enforcement and awareness of litter programmes 	2012 (completed)
<ul style="list-style-type: none"> Continued support of the Clean Up the World Campaign 	Ongoing
<ul style="list-style-type: none"> Campaign against dog fouling 	2012 (ongoing)
<ul style="list-style-type: none"> Creation of dog parks 	2013



11. How will the Government achieve the implementation of this plan?

11.1 Public Sector

Government has a mandate to lead by example in relation to the environment and to establish itself as a role model in the promotion of greener business practices.

The EAMP is the guiding document for all Government Departments on issues related to the environment. Government has already begun the process of greening up its own practices through:

- The creation of a green procurement policy
- The energy efficient refurbishment of government buildings
- The establishment of an environmental filter process

All Government bodies have an appointed environment officer(s) who is responsible for ensuring that the environmental principles set out in the Environment Charter and in this Plan are effected throughout their own organisations.

The results of these efforts will be reported in the Department of the Environment's Annual Report.

11.2 Private Sector

The Government will also continue to engage with the private sector through the Gibraltar Chamber of Commerce and the Federation of Small Businesses to advance sustainable practices and to support and encourage new businesses in the environmental field. This will include:

- The organisation of events for businesses to showcase their application of green practices to other businesses and citizens, and to provide networking opportunities
- Helping to establish a green business network through the Gibraltar Chamber of Commerce and the Gibraltar Federation of Small Businesses
- Establishing green business certification, standards and awards programmes

- Developing a green business development strategy that offers appropriate incentives to help establish a green economy in Gibraltar

11.3 Costs & Financing

The Government recognises that the implementation of this Environmental Action & Management Plan has certain cost implications and will be allocating a budget to this. Departments should identify the measures within the plan which are pertinent to them and estimate the costs associated with implementing these. These costs should then be included within their yearly budget estimates.

11.4 Review

The EAMP is a live document that will be reviewed periodically by the Government. It will be officially adopted for implementation by all Government Departments, Agencies and Authorities. The Department of the Environment will assist other Government bodies with its adoption and implementation. The Plan will be officially updated every 5 years.

Appendix AList of Environmental Legislation

Designation of Special Areas of Conservation (Rock of Gibraltar) Order 2012

Designation of Special Areas of Conservation (Southern Waters of Gibraltar) Order 2011

Designation of Special Protected Areas Order 2011

End-Of Life Vehicles Rules 2004

Environment (Abstraction of Ground Water) Regulations 2007

Environment (Air Quality Standards) Regulations 2010

Environment (Assessment and Management Of Flood Risks) Regulations 2010

Environment (Control of Dust) Regulations 2010

Environment (Energy Performance of Buildings Regulations) 2012

Environment (Fluorinated Green House Gases) Regulations 2011

Environment (Geological Storage of Carbon Dioxide) Regulations 2011

Environment (Infrastructure for Spatial Information) Regulations 2010

Environment (Labelling and Standard Product Information) Regulations 2011

Environment (Promotion of Clean And Energy-Efficient Road Transport Vehicles) Regulations 2011

Environment (Promotion of Energy Produced From Renewable Sources) Regulations 2011

Environment (Protection of Groundwater) Regulations 2009

Environment (Quality of Bathing Water) Regulations 2009

Environment (Sustainable Use of Pesticides) Regulations 2012

Environment (Waste) Regulations 2007

Environment Act 2005

Environmental (Assessment and Management Of Noise) Regulations 2006

Environmental Liability Regulations 2008

Environmental Protection (Controls on Substances That Deplete The Ozone Layer) Act

Environmental Protection (Disposal of Dangerous Substances) Act, 2000

Environmental Protection (Disposal of Persistent Organic Pollutants) Regulations 2006

Environmental Protection (Energy End-Use Efficiency) Act 2009

Freedom of Access to Information on the Environment Regulations 2005

Litter and Nuisances Rules and Regulations 1994

Marine Strategy Regulations 2011

Marine Nature Reserve Regulations 1995

Nature Protection Act, 1991

Ozone Depleting Substances (Qualifications) Regulations 2006

Pollution Prevention & Control Act, 2001

Public Health (Air Quality Limit Values) Rules 2002

Public Health (Air Quality) (Ozone) Rules 2004

Public Health (Freedom of Access to Information on The Environment) Rules, 1992

Public Health (National Emission Ceilings) Rules, 2003

Public Health (Pollution of the Aquatic Environment) Regulations, 1994

Public Health (Potable Water) Rules, 1994

Public Health (Quality of Bathing Water) Rules, 1992

Public Health (Urban Waste Water Collection and Treatment) Regulations 1999

Public Health (Waste) (Licensing Forms) Rules

Public Health (Waste) (Prescribed Register) Rules

Public Health (Water Framework) Rules 2004

Smoke-Free Environment Act 2012

Town Planning (Environmental Impact Assessment) Regulations, 2000

Transfrontier Shipment of Waste Regulations 1995

Waste (Extractive Industries) Regulations 2009

H.M. Government of Gibraltar
Department of the Environment



H.M. Government of Gibraltar Preliminary Flood Risk Assessment 2011

Government of Gibraltar Preliminary Flood Risk Assessment

Final Report

January 2011



Gibraltar Neanderthals

Entec
An AMEC company

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Document Revisions

No.	Details	Date
1	Draft report	11.11.2010
2	Final report	18.01.2011





Report for
Department of the Environment
Duke of Kent House
Line Wall Road
Gibraltar

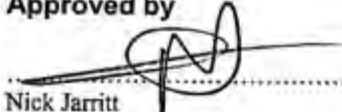
Government of Gibraltar
Preliminary Flood Risk Assessment

Main Contributors
Laura Pitkethly
Nick Jarritt
Gavin Appleby

Final Report
January 2011
Entec UK Limited

Issued by

.....
Laura Pitkethly

Approved by

.....
Nick Jarritt

Entec UK Limited
Pacific House
Imperial Way
Reading RG2 0TD
England
Tel: +44 (0) 1183 775600
Fax: +44 (0) 1183 775610

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Gibraltar Neanderthals



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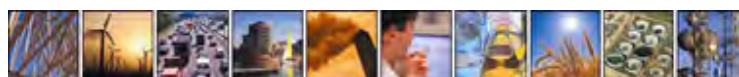
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Contents

1.	Introduction	1
1.1	The Role a Preliminary Flood Risk Assessment	1
1.2	Structure of this report	1
2.	Gibraltar River Basin District	3
2.1	Topography and Land Use	3
2.2	Geology	3
2.3	Climate and Rainfall	4
2.4	Tides	4
2.5	Water Bodies	4
2.6	Drainage Infrastructure	5
3.	Sources of Flooding	9
3.1	Flooding from Rivers	9
3.2	Flooding from the Sea	9
3.3	Flooding from Rainfall	10
3.4	Flooding from Groundwater	11
3.5	Infrastructure Flood Risk	11
3.5.1	Flood Defence Failure	11
4.	Flooding History	15
4.1	Rainfall Flooding	15
4.2	Flooding from the Sea	16
4.2.1	Storm Surge, October 2008	16
4.2.2	Impacts of the Storm Surge	17
5.	Future Flooding	21
5.1	Factors Affecting Future Flood Risk	21
5.1.1	Future Rainfall Events	21
5.1.2	Future Sea Flooding Events	21
5.2	Significant Flood Risk Areas	23
5.2.1	Level 1 Land Inundation	23
5.2.2	Level 2 Significant Flood Risk	25



6.	Summary and Conclusions	27
7.	References	31
Table 3.1	Potential Sources of Flooding	9
Table 5.1	Level 1 Land Inundation Areas	24
Table 6.1	Previous Flooding Incidents	27
Figure 2.1	Topography and Man Made Modifications	6
Figure 2.2	Solid Geology of Gibraltar	7
Figure 2.3	Gibraltar River Basin District	8
Figure 3.1	Indicative Locations of Flood Defences	13
Figure 4.1	Historical Surface Water Flooding	19
Figure 4.2	Records of Storm Surge Flood Damage	20
Figure 5.1	Level 1 Risk Areas: Areas at Risk of Land Inundation	26
Appendix A	Photos	
Appendix B	Summary of Wave Studies for Gibraltar Harbour	



1. Introduction

1.1 The Role a Preliminary Flood Risk Assessment

The EU Floods Directive, published in October 2007, aims to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. It requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding.

For zones identified as being within an area of “significant” risk to flooding, the Directive requires flood risk maps to be prepared by 2013. Flood risk management plans focused on prevention, protection and preparedness should then be established for the identified zones by 2015.

The Floods Directive has been linked to the Water Framework Directive (WFD), both in terms of scale (WFD River Basin Districts are the level at which risks must be assessed) and timing, requiring flood risk assessments to be reviewed periodically in conjunction with River Basin Management Plans. The WFD has a broad aim to contribute to ‘mitigating the effects of floods and droughts’, in addition to its primary focus on achieving good ecological status and preventing deterioration of existing status classifications. The Floods Directive can be viewed as the means by which the EU hopes to achieve the effective consideration of floods in parallel with the WFD river basin planning process.

Articles 4 and 5 of the Flood Directive require all member states to undertake a Preliminary Flood Risk Assessment (PFRA), based on available or readily derivable information to assess potential significant risks. This report has been produced for the purpose of complying with Articles 4 and 5 of the Directive, and comprises the PFRA for the Gibraltar River Basin District.

1.2 Structure of this report

This report is structured as follows, to ensure that all the requirements of Article 4 are met:

- Chapter 2: Gibraltar River Basin District, provides a description and maps of the district [as required under Article 4 (2)(a)];
- Chapter 3: Sources of Flooding, outlines the potential flooding sources in the district;
- Chapter 4: Flooding History, summarises the previous flooding incidents in the district [as required under Article 4 (2)(b)];
- Chapter 5: Future Flood Risk, assesses the climate change impacts and likely consequences and significance of future flood events [as required under Article 4 (2)(c), (2)(d) and Article 5];
- Chapter 6 presents the overall summary and conclusions of the PFRA.





2. Gibraltar River Basin District

An Initial Characterisation of the Gibraltar River Basin District (RBD) was prepared in 2005 in partnership between Entec UK Ltd, Northumbrian Water and AquaGib on behalf of the Government of Gibraltar. The Characterisation Report was prepared in accordance with Article 5 of the WFD. A summary of the river basin's environmental characteristics is presented in this Chapter, taken from the 2005 report.

2.1 Topography and Land Use

Gibraltar covers a surface area of approximately 5.8 km² and topographically it consists of 2 distinct areas (Figure 2.1): the 'Rock' rising sharply to more than 400 m above sea level with a precipitous east coast facing the Mediterranean and; the more gentle west coast on which the town and harbour are located facing the Bay of Gibraltar. Much of the town and naval base is located on reclaimed land extending into the harbour area, as shown in Figure 2.1.

For about 1 km from the north face of the Rock to the Spanish frontier the land is very flat and is located just above sea-level. This area is known as The Isthmus and is occupied mainly by the Devil's Tower Road commercial and residential areas, Devil's Tower Camp, Four Corners Camp and the airport runway and supporting infrastructure. It is bordered on the west by the Bay of Gibraltar and on the east by the Mediterranean Sea.

At the southern tip of Gibraltar is Europa Point, where the coastal waters of the Bay of Gibraltar meet the Straits of Gibraltar. At the straits the interface between the less saline and cooler Atlantic waters and the deeper Mediterranean waters occurs at a depth of around 250 m.

The majority of the built up area is sited on the more gentle west coast between the airport and the southern plateaux at Europa point. There are however some small settlements at the foot of the east face of the Rock, at Catalan Bay and further south at Sandy Bay.

2.2 Geology

The Gibraltar "Rock" is made up of the Gibraltar Limestone Formation of early Jurassic age. The Limestone Formation is generally a hard rock containing fragmentation and deformations. It is divided into four members ranging from dark grey dolomite to lighter fine grained limestone.

The Isthmus and lower slopes of the Rock are covered by thick superficial Quaternary deposits of sands and scree breccias.

Figure 2.2 presents the geology of the district.



2.3 Climate and Rainfall

Gibraltar experiences a Mediterranean climate with moderate winter rainfall and dry summers. The district has an average annual rainfall of 778 mm (from hourly rainfall provided from 1987 to 2006), which falls principally in the winter months around 75% of which originates from westerly winds. Rain storms can therefore reach high intensities during the winter months. Summers are generally warm and dry, and winter temperatures can fall to close to 0°C.

2.4 Tides

The coastal waters surrounding Gibraltar are subject to ocean currents that are both tidal and non-tidal in origin. Tidal amplitudes in the western Mediterranean Sea are affected by tidal inputs from the Atlantic Ocean, resulting in relatively large amplitudes compared to other areas of the Mediterranean. The tidal range between daily high tides and low tides is approximately between 0.4 and 1.2 metres, as monitored in the harbour of Gibraltar by the Proudman Oceanic Laboratory (<http://www.pol.ac.uk/ntslf/gibraltar/>).

Non-tidal flows through the Strait of Gibraltar are caused by either:

- Weather - air pressure and the affect of wind on the sea surface;
- Differences between the densities of the Atlantic Ocean and Mediterranean Sea.

2.5 Water Bodies

The Gibraltar RBD and water bodies are defined as shown in Figure 2.3. The RBD does not contain any significant natural surface water courses and four distinct water bodies have been identified:

- Two coastal water bodies;
- Two groundwater bodies (the Northern and Southern groundwater bodies).

Coastal Water Bodies generally extend to one mile from the coastline. The Gibraltar River Basin Management Plan is currently under production, which will review the need to designate the harbour area and northern marina as a Heavily Modified Water Body. The Initial Characterisation Report provisionally designates the harbour area and northern marina as two separate Heavily Modified Water Bodies, and the coastal waters excluding the harbour area and extending to one mile from the coastline comprise the second surface water body in the RBD.

The Northern Groundwater Body is located in the upper aquifer of the Isthmus Sands and there is currently only one licensed abstraction for light industry. Very small quantities are also abstracted from the North Front Cemetery but the quantities abstracted are too small to render licensing. The Southern Groundwater Body is located within the Limestone Bedrock and has been subjected to spillages of hydrocarbons in the past.



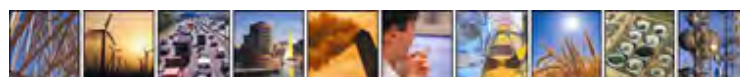
2.6 Drainage Infrastructure

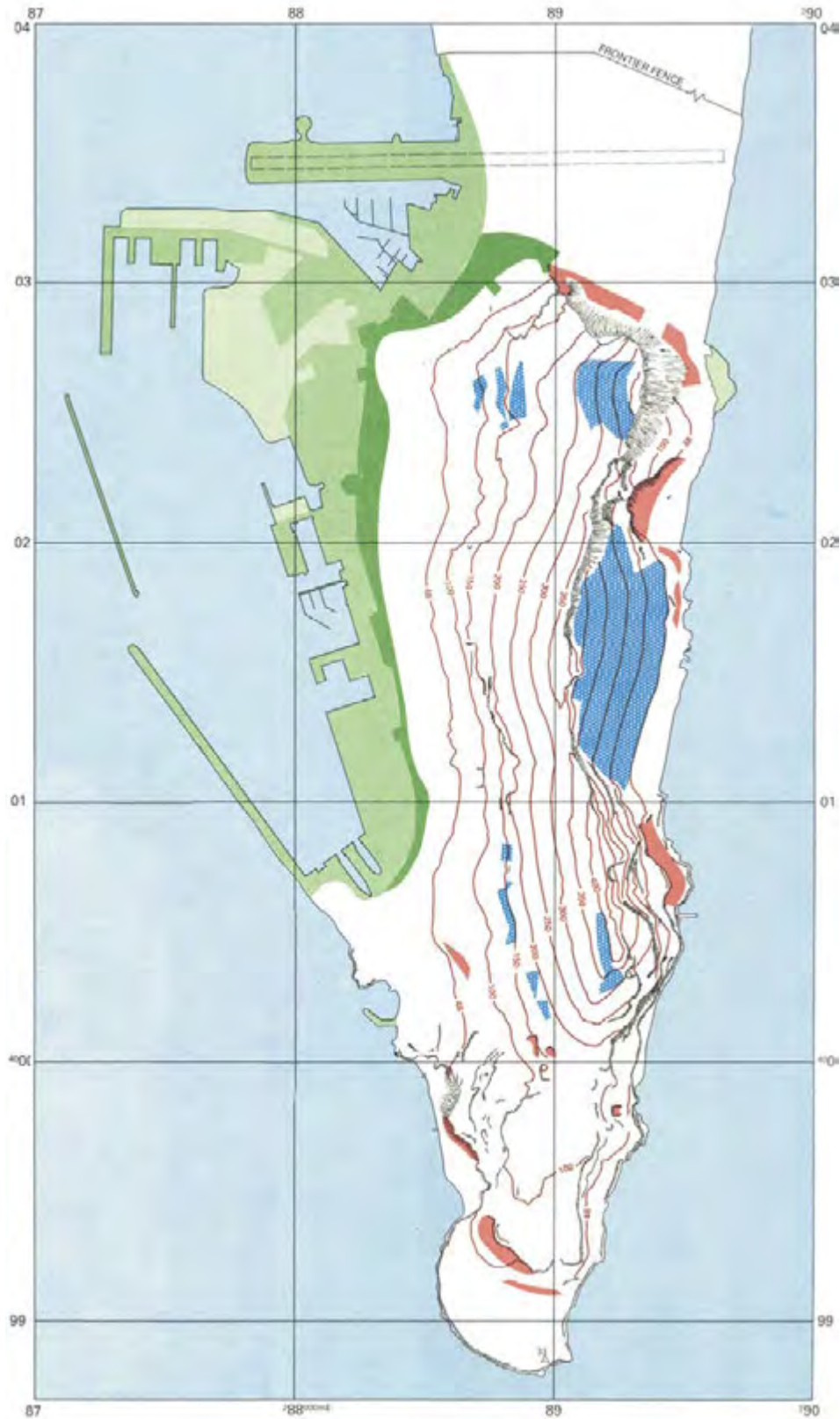
Surface water drainage and sewerage infrastructure is based around a large trunk sewer which runs from Line Wall Road southwards to its discharge location at Europa Point. The drainage system is based on historic combined foul and surface water infrastructure. Newer areas have been built with a separated system with limited connectivity between the two for storm overflows.

Areas of the town to the east and upstream of the Trunk Sewer are served by drainage which gravitates into it via combined or foul drainage networks. It is mainly the old town area therefore where the drainage operates under gravity. Areas which cannot gravitate are predominantly separated foul networks which are served by approximately 30 pumping stations (belonging to AquaGib and the MoD) which currently discharge to a variety of points along the Trunk Sewer. These areas include the northern and western parts of the town and the dock area.

In addition there are six storm overflows on the Trunk Sewer which discharge through short outfalls to the sea and the harbour area on the west coast of Gibraltar. The overflow discharges into the harbour area are all generally submerged outfalls. Some of these have been increased in length from their original location as a result of increased land reclamation over the years. This has also led to a subsequent lowering of the outfalls.




The majority of the drainage system is relatively old, and has been subject to collapse in places. Siltation also occurs mainly as a result of the flat gradient of some of the pipes. Maintenance of the pipes takes place to manually remove the accumulated silt, in particular in the trunk sewer.







Key

Fill & Man Made

-  Post 1985
-  1900 - 1985
-  Pre 1900

Engineering Works

-  Quarry face
-  Water catchment (now disused)

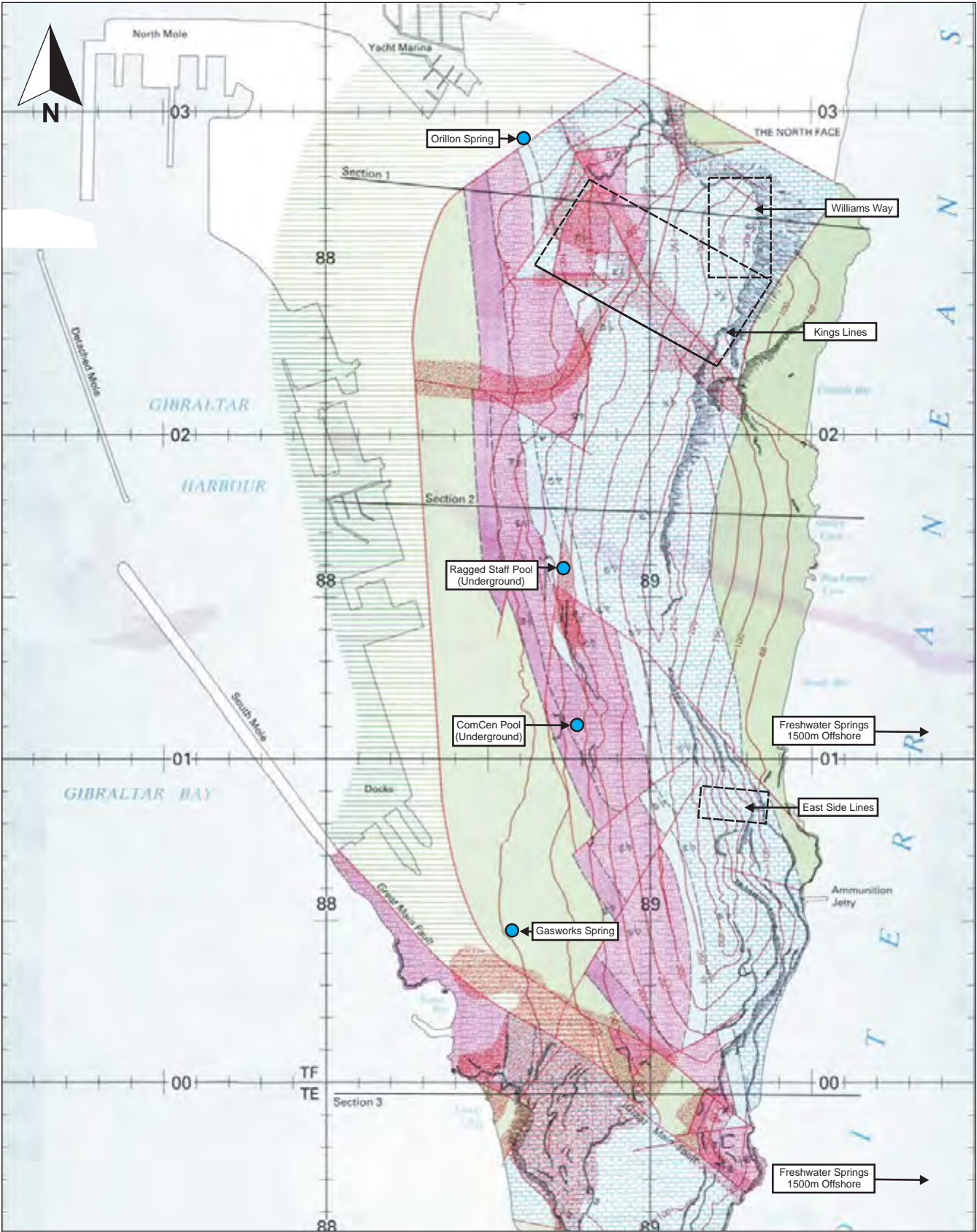
0 km  1 km

Gibraltar EU Floods Directive
Preliminary Flood Risk Assessment

Figure 2.1
Topography and Man Made
Modifications (from Rose and
Rosenbaum 1991)

November 2010
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Entec



Key

	Bedrock unknown (obscured by superficial sediments or by the sea)		Interbedded dolomite and limestone
<i>Tectonic Breccia</i>			Pale grey dolomite
	Source rock indicated where possible		Dark grey dolomite
<i>Pre-Quaternary</i>			Mudstone, sandstone and dolomite
	Mudstone, limestone and chert		Mudstone and sandstone
	Limestone with some dolomite		

0 m 500 m

Gibraltar EU Floods Directive Preliminary Flood Risk Assessment

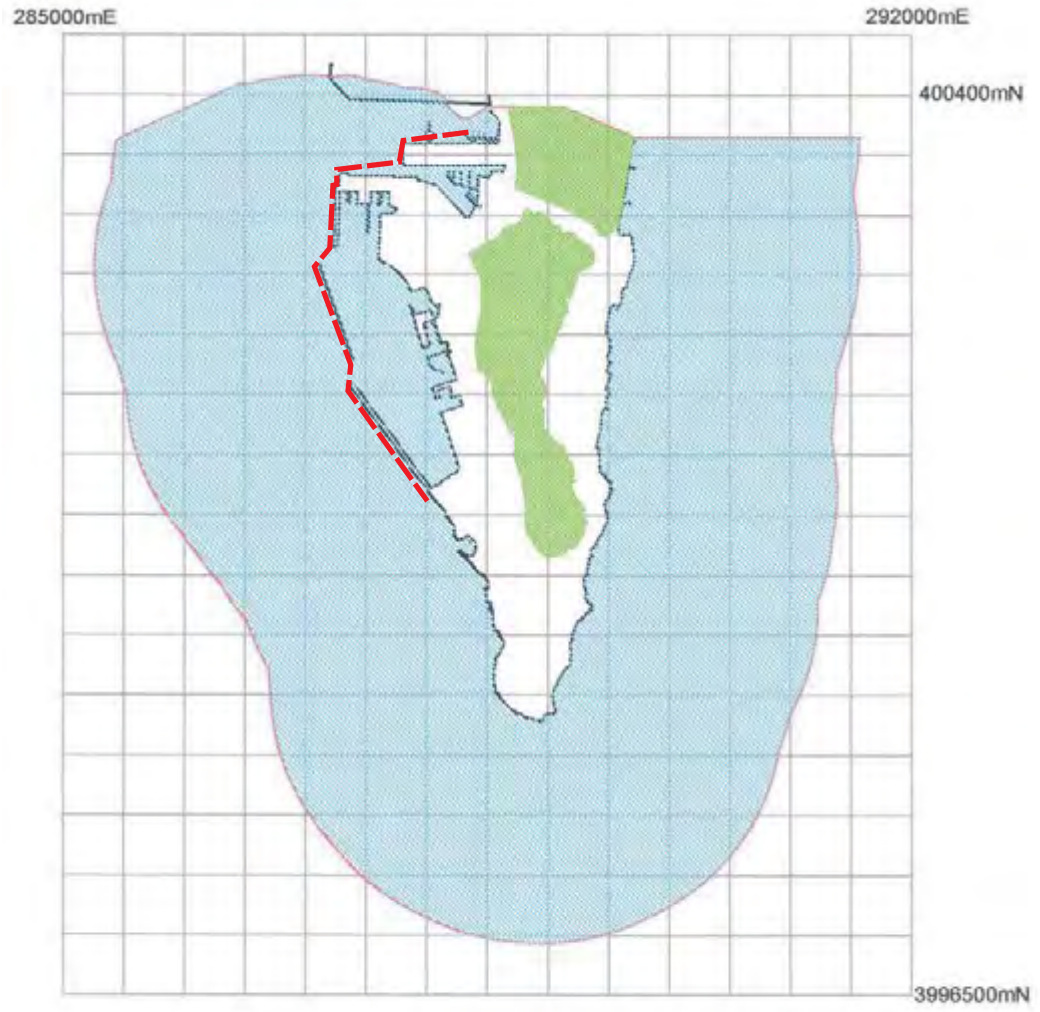
Figure 2.2
Solid Geology of Gibraltar, Bedrock Waterbody is Within Gibraltar Lines. Fuel Storage Areas, Pools and Main Springs also shown (from Rose and Rosenbaum 1991)

November 2010
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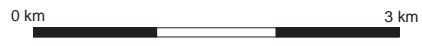
Gibraltar Neanderthals

Reproduced using 'Geology of Gibraltar' 1991.



Key

- | | | | |
|---|-------------------------------|---|--|
|  | Coastal water |  | Provisionally identified heavily modified water body |
|  | Groundwater | | |
|  | River basin district boundary | | |
|  | Rock outline | | |
|  | Gridline | | |



Gibraltar EU Floods Directive
Preliminary Flood Risk Assessment

Figure 2.3
Gibraltar River Basin District

November 2010
27593-B07.cdr parkj



3. Sources of Flooding

There has been no modelling of flooding for Gibraltar or mapping of potential flood risk areas for the river basin district. Information in this section on flooding sources is therefore derived from an assessment of the water bodies in the district and from anecdotal evidence provided at the Inception Meeting with the Department of the Environment. Article 2 of the Directive defines ‘flood’ as meaning *the temporary covering by water of land not normally covered by water. This shall include floods from rivers, mountain torrents, Mediterranean ephemeral watercourses, and floods from the sea in coastal areas, and may exclude floods from sewerage systems.*

Table 3.1 presents a general overview of all potential flooding sources in line with the Article 2 definition, and therefore excludes sewer flooding. The flooding mechanisms from each source listed in Table 3.1 are described in more detail where appropriate in the subsequent sections of this Chapter.

Table 3.1 Potential Sources of Flooding

Source of Flooding	Risk Present	Notes
Rivers	No risk	There are no watercourses present and therefore there is no risk of river or channel flooding
Rainfall	Risk Present	There is a risk of heavy rainfall ponding on roads and surfaces or exceeding the drainage capacity within the urban areas of the district
Groundwater	No risk	Groundwater flood risk is considered to be minimal. The Southern groundwater body is located within the Rock with a large difference between ground levels and the water table. In addition, both the Southern and Northern aquifers are in close hydraulic continuity with the coastal water body thus minimising the risk of flooding.
Sea	Risk present	Flooding from the sea presents one of the main sources of potential flooding in the district, surrounding Gibraltar on both sides. Flooding could potentially occur from the Mediterranean Sea or from the Bay of Gibraltar as a result of storm surges, wave action or a combination of these with high tides.
Infrastructure (e.g. flood defence failure)	Residual risk present	There is a residual risk that flood defences could fail and cause flooding during extreme tidal events

3.1 Flooding from Rivers

As there are no watercourses present in Gibraltar, there is no source of fluvial or river flooding present.

3.2 Flooding from the Sea

Flooding from the sea occurs infrequently in Gibraltar but can have severe consequences when flooding occurs.



Flooding of coastal areas may be caused by seasonal high tides such as those driven by the spring neap tide cycle, storm surges and where increase in water level above the astronomical tide level is created by strong on-shore winds or by storm driven wave action. All three mechanisms can combine to cause flooding of coastal areas.

Meteorologically-induced sea level rise is the term used to describe the phenomena of deep low pressure weather systems causing the surface of the sea beneath the centre of the depression to dome upwards. The sea surface is raised because the centre of the deep low pressure system is applying less downward force on the sea surface than is being applied by the atmosphere outside the low pressure system. This dome of water advances with the progression of the storm and when the storm makes landfall so does the dome of water or 'storm surge'. If meteorological conditions coincide with astronomically controlled flood tides (Spring tides) then the resultant water level can be even higher and thus flooding can be even more extensive.

In Gibraltar there is the potential for wave action to cause flooding of the coastal areas during storm events with very strong easterly winds. This can affect the eastern coast facing the Mediterranean including Catalan Bay and Sandy Bay, which receive the on-shore winds and are subject to wave overtopping. The western face of the district can also be impacted by easterly storms if waves reflect off the newly reclaimed and much enlarged Port of Algeciras and rebound toward Gibraltar.

The submerged position of the six storm overflows means that the discharge capacity of those pipes is controlled by sea level at all times. Therefore the highest tides or sea levels will result in the lowest capacities to discharge flood flows from rainfall. Where inflow exceeds outflow, surface water may not be able to enter the system and foul flows which overflow from the trunk sewer at a much higher level, may exit the system via lifted manhole covers or gulleys on combined systems. Hence, during periods of extremely high tides, the ability of the sewer system to pass forward large surface water flows is heavily compromised, resulting in localised flooding in low lying areas or areas subject to large volumes of surface water flow.

Flooding incidents that have previously occurred in Gibraltar and affected coastal areas are discussed in Section 4.1.

In response to the potential risk of flooding from the sea in the town and harbour area, sea defences have been constructed to protect existing areas from flood risks. The defences are discussed in more detail in Section 3.5.2 below.

3.3 Flooding from Rainfall

Small scale flooding occurs in Gibraltar frequently as a result of rainfall, although with relatively low consequences. Flooding is caused by heavy rain storms falling onto the impermeable surfaces and low lying areas of the town: the rain storms experienced in Gibraltar tend to be very heavy downpours that can lead to rapid accumulation of surface water which can overload the drainage system very quickly.



Surface water flooding has been known to occur in the lower lying areas of the town. Heavy rain falling onto the higher ground within the urban area and on parts of the Rock, which are steeply sloping, will generate surface runoff that will cause flooding when it reaches the flatter areas of the town.

Surface water drainage in the upper urban areas (including the old town) in Gibraltar is drained by the trunk sewer, which discharges to the sea at Europa Point. It is known that the capacity of the trunk sewer can be reduced by siltation which may also contribute to surface water flooding. Surface water drainage in the lower urban area comprises a number of surface water only outfalls, and six combined storm outfalls.

3.4 Flooding from Groundwater

Groundwater flooding is unlikely to occur in Gibraltar and there have been no recorded incidents of flooding from this source. The Southern groundwater body is located within the Rock and it is anticipated that the large difference between ground levels and the water table in this aquifer will prevent flooding from groundwater sources. The Northern groundwater body is located in an area with much lower elevations, however there are no reported incidents of groundwater flooding. Flooding is thought to be unlikely from the Northern Aquifer because increasing groundwater head is likely to increase outflow to sea rather than cause flooding.

3.5 Infrastructure Flood Risk

3.5.1 Flood Defence Failure

Sea defences are present at numerous locations around the Gibraltar coastline to protect the built environment from wave overtopping and sea water inundation during storm events. A description of the sea defences is presented below and Figure 3.1 shows the indicative locations and types of defences present.

Rock revetments are located in the mid harbour and the southern part of the district in Little Bay and Camp Bay. Those in the harbour area have recently been restored following a storm surge which occurred during a 4 metre swell in 2008 (refer to Chapter 4).

The North and South Moles that form the outer edge of the harbour area also afford protection from storm surges, through dissipating wave energy before it reaches built up area.

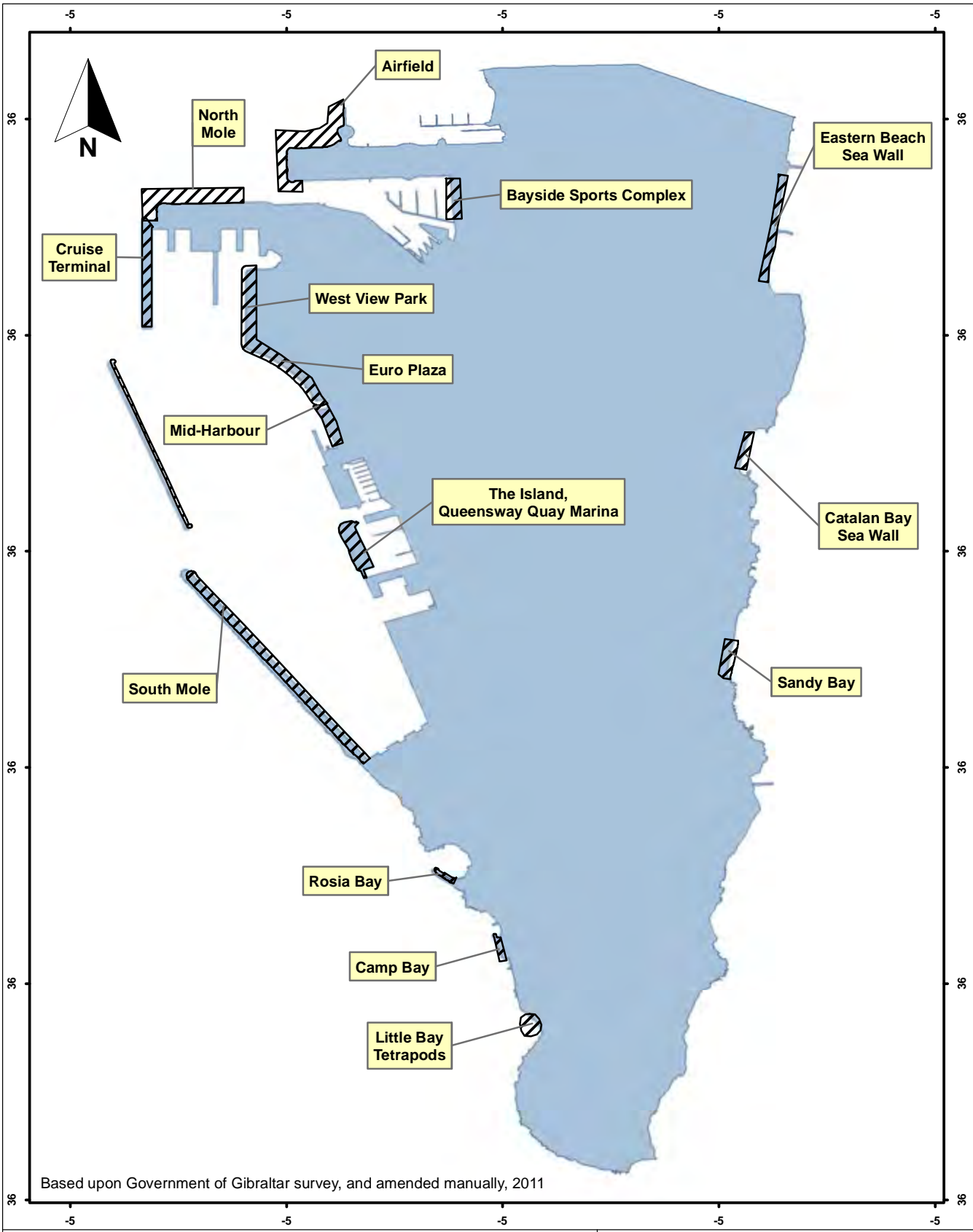
South of the harbour area at Camp Bay on the western shore of Gibraltar, sea defences in the form of nominal tetrapods and rock gabions are present to dissipate wave action

Along the eastern coast of the district there are sea walls present at Eastern Beach Road and Catalan Bay and recently constructed rock armour at Sandy Bay. There are plans to reclaim an area to the north of Catalan Bay through a privately funded scheme, which will provide some further protection from north easterly storm events at Catalan Bay in addition to the sea wall.




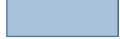
The risk of these defences failing is considered to be minimal, and therefore the risk of flooding from defence failure is not considered further.





Based upon Government of Gibraltar survey, and amended manually, 2011

Key:

-  Indicative locations of flood defences
-  Gibraltar coastline 2011

Gibraltar EU Floods Directive
Preliminary Flood Risk Assessment

Figure 3.1
Indicative Locations of Flood Defences

Project Path:
R:\Data\Projects\HM-255\27593 Gibraltar PFRA\
Drawings\GIS\27593-B04 Figure 3.3 Indicative
Locations of Flood Defences.mxd

0 1,000 Metres
Scale: 1:25000 @ A4
Geographic Coordinate System - WGS84 Spheroid

January 2011
27593-B04 stokr



Gibraltar Neanderthals



4. Flooding History

Gibraltar has experienced numerous floods in recent history, predominantly from storm rainfall events or from storm surges from the sea. There is currently no formal database of flooding records to draw upon. Instead, this section presents an overview of the flooding events that have occurred recently from anecdotal evidence, supported by photographic evidence where available. Figures 4.1 and 4.2 show areas that have previously been flooded.

4.1 Rainfall Flooding

Flooding due to rainfall results from three basic mechanisms:

- Runoff from the Upper Rock flows first in open channels to the head of surface and combined water systems. Where these drainage systems become inundated, overland flow occurs predominantly along roads. This often results in flooding in the lower gradient areas of the town where ponding occurs. Ultimately all of these flows drain to surface water and combined outfalls;
- There are a few areas such as Wellington Front where overland flows find it easier to cross the trunk sewer and drain directly to the lower town area. Here they contribute to surface water ponding which ultimately drains to the surface water and combined outfalls;
- In the lower town area below the level of the trunk sewer flooding occurs predominantly by ponding of rainwater in the low lying depressions. An element of overland flow from the surrounding areas contributes to this.

There are certain areas within the town that are susceptible to flooding during heavy and intense rainfall events. Photographs of previous flooding in the areas discussed are presented in Plates 1 to 8 in Appendix A.

- **Queensway and Wellington Front.** Queensway is prone to surface water flooding along its entire reach especially between the Ragged Staff Roundabout and Wellington Front areas. It is thought that the surface water drainage system backs up, and is also subject to some minor collapses in the pipe network. During heavy downpours standing water will accumulate in many places, where there are predominantly impermeable surfaces combined with a potentially inadequate drainage system. A solution to the issue is currently being investigated. The photograph in Plate 1 shows flooding which occurred in January 2010;
- On the eastern, town side of Wellington Front, ground elevations are approximately 1 metre lower than Queensway and approximately 5 metres lower than land immediately to the east on Line Wall. This area provides car parking spaces for users of the clubs and organisations which occupy the vaults contained within Wellington Front. Flooding occurs in this area due to inadequate drainage which is currently being addressed (see Plate 2);
- **Fish Market and Orange Bastion.** North East of Queensway, the Fish Market Place and Fish Market Lane (near Orange Bastion) both experience flooding during heavy rainfall events. This is considered to be partly due to the expanse of impermeable surfaces combined with the low lying elevations.



Surface water drainage relies on pumping stations in this area to connect to the Trunk Sewer which cannot cope with the pumping demands required during episodes of prolonged and intense rainfall. The photograph in Plate 3 shows surface water ponding that occurred in March 2010;

- **Laguna Estate.** This area is located at the northern end of the town near to Victoria Stadium. The estate is between Winston Churchill Avenue, Devils Tower Road and the Northern Defences. Laguna Estate was historically a marsh, which was later dug out to become a lake (known as The Inundation). It was then later filled to provide building land. Small-scale flooding has taken place in the past during heavy rainfall events due to the combination of the inadequate drainage system and low lying impermeable surfaces. Flooding has been reported to affect businesses in this area (Inception Meeting, 03 March 2010);
- **Rosia Road.** Heavy rainfall during a storm event that occurred in October 2008 led to significant flooding of some the coastal areas (described in more detail in section 4.2 below). The heavy rainfall caused flooding on Rosia Road near to Jumper's Bastion which significantly affected traffic movement. The photograph in Plate 4 shows sediment-entrained flood water on the road and car parking areas. The colour of the water is further indication that this run-off is likely to be generated uphill on the Rock, and that the steepness induces run-off, rather than permitting rain to infiltrate into the ground above the town.

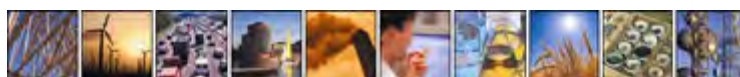
Figure 4.1 presents the location of these areas described above that have previously experienced surface water flooding from heavy rainfall events.

4.2 Flooding from the Sea

Gibraltar has experienced flooding from the sea as a result of storm surges throughout its history, affecting the coastal areas. The section below describes the most recent and most significant flood event from recent history, which occurred on 10 October 2008.

4.2.1 Storm Surge, October 2008

On 10 October 2008 a particularly low pressure storm combined with a high tide and caused a severe storm surge. This caused one of the most significant flooding events in Gibraltar in recent history. Flooding occurred in many coastal areas of Gibraltar as a result of the sea overtopping the sea walls in the harbour area and inundation of the west coast settlements, and damage to sea defences on the east coast. Substantial damage was caused to some buildings in the coastal area. The most damage occurred in the area of the Europlaza residential building and the car parking areas between Morrisons supermarket and the harbour (WestView Park), where the sea wall and rock revetments were breached. Sea water inundated the area and the underground car park beneath the Europlaza, and the loose rocks from the breached defences also caused some of the building damage. This location in the harbour is considered to be currently the most exposed location to storm surges and as a result suffered from the full force of the storm. The photographs in Plates 5 and 6 show the damage to the sea defences at West View Park and the Europlaza building.



Further damage occurred to the North Mole of the harbour including the cruise terminal building, Port Authority building, post office sorting building, highway and the saltwater extraction water mains. The buildings were flooded and also experienced some structural damage and collapse from debris washed in with the sea and from the breached revetments. The road linking the buildings on the North Mole was also significantly damaged and uplifted by the storm surge. Further south of the harbour, both Queensway Quay Marina and the Comorant Boat Camber also sustained damages.

Some damage occurred on the airport runway and jetties near to Western Beach, which were damaged and parts eroded by the force of the water. Buildings and structures along the South Mole also experienced flood damage from being inundated by the force of the storm tide. Other recorded incidents of flooding and damage occurred at Rosia Bay as well as further inland from the wind and rain which affected buildings. The storm winds came from an easterly direction and it has been ascertained that the major contributor to the damage caused was the new Algeciras breakwater which reflected the incoming easterly swell towards to Western coastline of Gibraltar (assessment undertaken by Deltares in 2008 and 2009, summarised in email dated 14 December 2010, reference 1203913-000-HYE-0004, see Appendix B)

The eastern coast of Gibraltar is much less developed. However, the two main residential areas at Catalan Bay and Sandy Bay also experienced flood and storm damage during the October 2008 event, and are generally subject to storm damage from storm surges and from coastal erosion. On this side, the Rock slopes steeply into the sea therefore the two settlements at Catalan Bay and Sandy Bay are backed by the steep slopes and are fronted by the sea. Wave action against the steep shore results in gradual erosion of the coastline. During the 2008 event, the beach in front of Sandy Bay was completely inundated and sea defences were damaged. Damage did occur at the sewage pumping station which suffered irreparable structural damage. Plates 7 and 8 show the proximity of the development at Sandy Bay to the shore with collapsed sea defences and Catalan Bay.

Figure 4.2 maps the locations where significant damage occurred as a result of the storm surge event in October 2008. It should be noted however that during this storm event, no residential properties were significantly damaged.

4.2.2 Impacts of the Storm Surge

Apart from the physical damage caused by the storm surge, economic impacts were also observed predominantly due to the damage caused to sea defences alongside West View Park and the East side. The cost of repair to the harbour and Western sea defences sums up to £10 million and accounts for the sum of individual work packages that were required. Some of this repair work is still ongoing. An additional £200,000 was spent on the rock armour at Sandy Bay to prevent further damage to the housing complex immediately behind Sandy Bay known as Both Worlds.

West View Park located immediately behind the defences in the harbour provided a local environmental setting for recreational activities. As a result of the flooding event this area was washed away, removing the park facilities provided for the local community. Rebuilding of the park is ongoing.



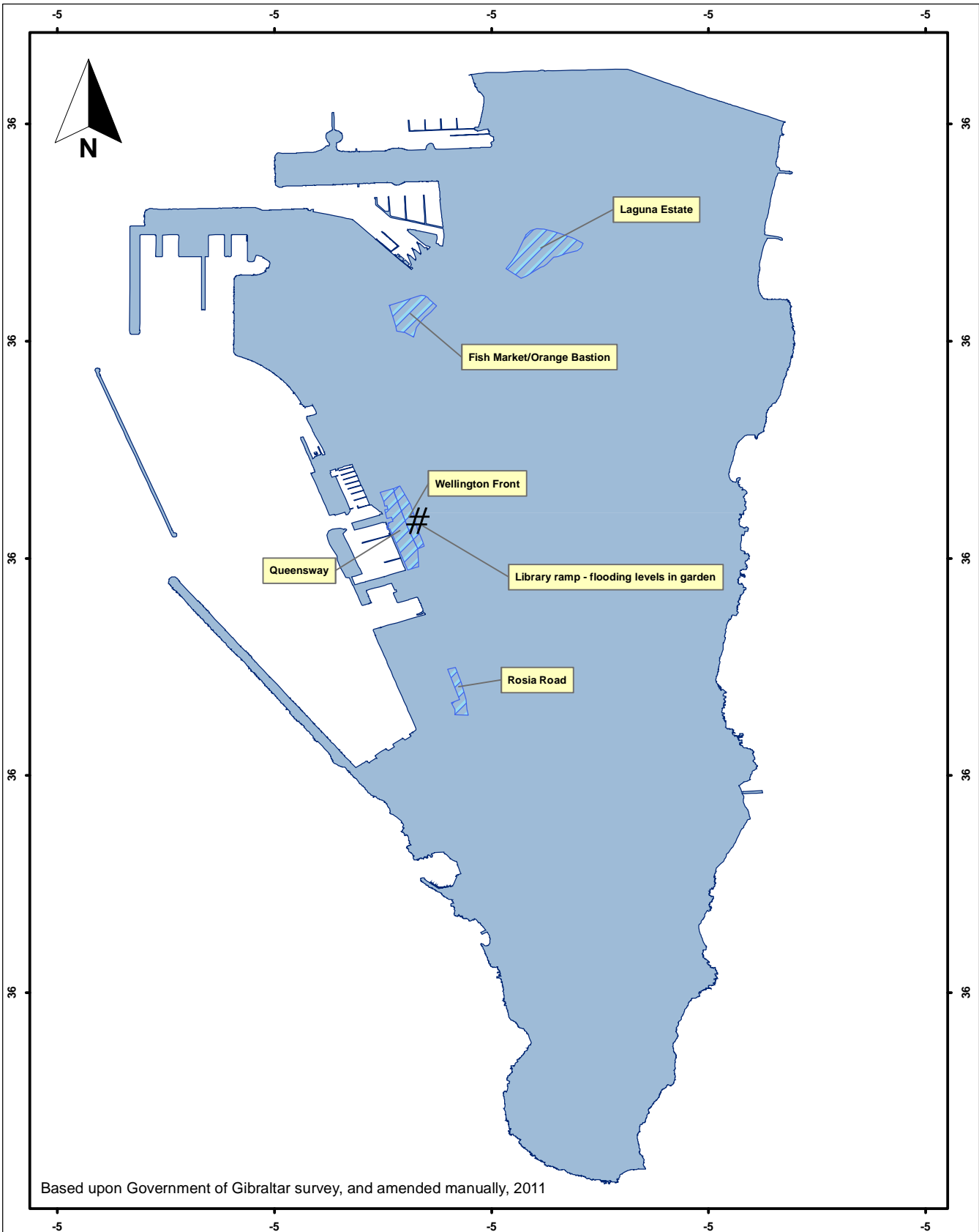
Queensway Quay Marina and the Comorant Boat Camber sustained damages although the Queensway Quay Marina developers are concurrently constructing new breakwaters at both entrances to the marina to considerably reduce the risk of damages from storm surges.

Recreational activities such as yachting also suffered from the October flooding. The small boat marina that was situated at Western Beach has been completely destroyed by wave action during repeated storm events. The marina has not been replaced.

As discussed above, the sewage pumping station at Sandy Bay was damaged, impacting on sewerage services to the Both Worlds complex on the eastern side of Gibraltar. Works carried out include placing rock armour along the front of the existing retaining wall along Sandy Bay beach, demolishing damaged structures and repairing the sewage infrastructure at Sandy Bay.




There were no recorded incidents of impacts on human health from this or from previous storm surge flood events in Gibraltar.





Gibraltar Neanderthals

Key:

-  Library ramp
-  Indicative areas of previous surface water flooding
-  Gibraltar coastline, 2011

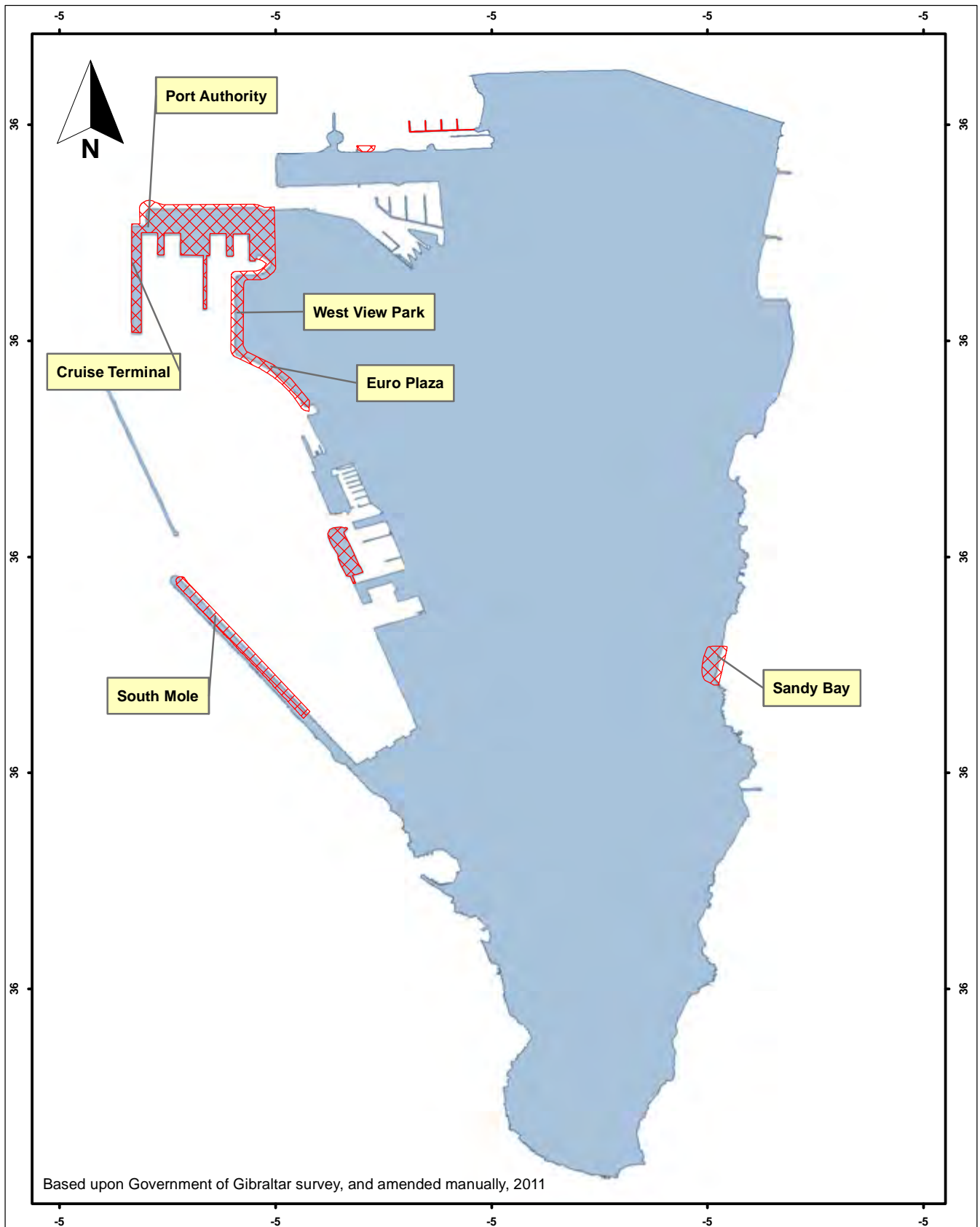
Gibraltar EU Floods Directive
Preliminary Flood Risk Assessment

Figure 4.1
Historical Surface Water Flooding



Project Path: R:\Data\Projects\HM-255\27593 Gibraltar PFRA\Drawings\GIS 27593-B01\Figure 4.1 Historical Surface Water Flooding.mxd
 Scale: 1:25000 @ A4
 Geographic Coordinate System - WGS84 Spheroid

January 2011
27593-B01 stok





Key:

-  Records of storm surge flood damage October 2008
-  Gibraltar coastline, 2011

Gibraltar EU Floods Directive
Preliminary Flood Risk Assessment

Figure 4.2
Records of Storm Surge Flood Drainage
(October 2008)

Project Path: R:\Data\Projects\HM-255\27593 Gibraltar PFRA\
Drawings\GIS\27593-B02\Figure 4.2 Records of Storm
Surge Flood Drainage (October 2008).mxd

0 250 500 Metres
Scale: 1:25000 @ A4
Geographic Coordinate System - WGS84 Spheroid

January 2011
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Entec

5. Future Flooding

5.1 Factors Affecting Future Flood Risk

It is possible that flooding could occur in the future as a result of the same mechanisms that have caused flooding in the past: surface water flooding from heavy rainfall or coastal flooding from storm surges. These issues are discussed in the following sections in more detail. Section 5.2 discusses the significance of future flooding in Gibraltar.

5.1.1 Future Rainfall Events

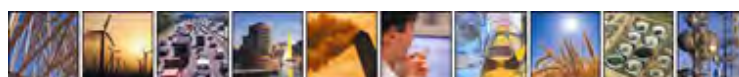
The areas susceptible to surface water flooding (Figure 4.1) include Queensway, Wellington Front, Rosia Road, Fish Market and Laguna Estate. New stormwater pumps have been installed at Fish Market so this area should now have a reduced risk of flooding. Flooding along Queensway is currently being investigated by Entec on behalf of the Government of Gibraltar, to identify a potential solution to increase the capacity of the drainage network to cope with storm rainfall events. The delivery of infrastructure improvements in this area will aim to reduce the flood risk from surface water. It might be reasonable to conclude therefore that the engineering work will potentially reduce the flooding extent along Queensway between Ragged Staff roundabout and Wellington Front.

The remaining areas at risk from surface water flooding (Wellington Front, Rosia Road and Laguna Estate) will continue to be at risk during intense rainfall events without further investigations and engineering solutions, but could be managed if investment in engineering becomes available.

The Gibraltar Climate Change Programme, 2008, states that the predicted effects of climate change in the Western Mediterranean are expected to include lower levels of rainfall but a change in the distribution and intensity of rainfall. This means that rainfall storms may become heavier leading to an increase in flooding. The extent of flooding in the areas currently at risk could potentially increase therefore, with higher intensity rainfall events. If rainfall intensities increase, future flooding in the town areas could affect some transport routes and cause damage to ground floors of offices and residential buildings.

5.1.2 Future Sea Flooding Events

The storm surge that caused damage of coastal areas in October 2008 was the most significant flooding event in recent history. Whilst storm surges could potentially reoccur around Gibraltar, the probability of a surge occurring of the same magnitude will be relatively small. As previously stated, the major contributor to the problems encountered on the 10th October 2008 was the Algeciras breakwater (review undertaken by Deltares, email dated 14th December 2010). Since then, those above-water perforations on the side of the new breakwater at Algeciras that had not been opened at the time (only some of the above water perforations were open) and all of the below water perforations (none of the below water perforations had been opened at that time), have been opened. These



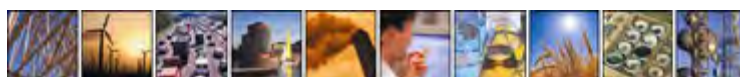
perforations act as wave dampeners so the situation that arose in October 2008 should not be repeated although clearly the situation will never revert to what it was before the breakwater was constructed. Furthermore, the replacement of the sea defences in the harbour has enabled a higher degree of protection to be provided: the renewed sea defences are considerably higher than the defences that have been replaced, such that if the same magnitude storm occurred, overtopping would not be possible. Therefore it is not considered that significant damage would occur in the same areas that were flooded in 2008, due to the renewed defences and the correct operation of the Algeciras breakwater.

Flooding and coastal erosion to the eastern side of Gibraltar is likely to continue, impacting the settlements at Catalan Bay and Sandy Bay, however significant damage is not anticipated due to the elevated height of some of the buildings, and because of number of properties likely to be affected is small. At the time of writing, a new access road is being constructed which will be tunnelled beneath the airport runway and will emerge on the eastern side of Gibraltar. Numerous design considerations are being implemented to minimise any potential flood risks associated with storm surges. On the eastern wall forming the South Approach Ramp, the concrete parapet will act as a security fence and a flood defence barrier from the south portal of the Gibraltar Airport Tunnel to Sunrise View apartments. The Contractor shall determine in the detailed design the actual height of the concrete barrier required to meet the following flood protection criteria:

- Protect the Airport Approach Road from flooding under the event of the high tide and storm waves that would cause the most onerous design conditions with a 1:200 year return period. The concrete parapet level shall be set to provide this level of protection with overtopping discharge kept below 0.01 litres/s/m at all locations;
- The design shall comply with the requirements of BS 6349 Maritime Structures, recommendations and guidance contained in EurOtop Wave Overtopping of Sea Defences and Related Structures: Assessment Manual, August 2007 (www.overtopping-manual.com) and the other Standards referred to in AIP Document Ref. 13803/AIP/03;
- Sea level rise of 0.5m will be taken into consideration in line with climate change predictions for the Mediterranean (see below).

The potential for part of the access road to be susceptible to flooding from storm surges, due to its proximity to the eastern shore will therefore be minimised.

Flooding events could also be affected in the future from the potential impacts of climate change such as changes to weather, rainfall patterns and sea level. The Gibraltar Climate Change Programme (2008) indicates that a predicted increase in sea level in the order of 0.48m by 2100 is a reasonable figure to be applied to Gibraltar, based on best estimates of between 0.28 and 0.58m above 1989 to 1999 sea levels. The replacement sea defences have taken account of potential sea level rise from climate change impacts so that the height of the sea wall is greater than predicted future sea levels. The Moles forming the harbour area are also above this predicted future level, and therefore afford continuing protection to the harbour and town area from storm surges.



With the provision of renewed defences in the harbour and on the North Mole, the impact on the residential areas of the harbour, the structural defences and the economy is likely to be minimised. Flooding within much of this area would be a residual risk only, as much of the land benefits from sea defences and raised ground levels, however it is recognised that there is a low risk of defences being overtopped. There are, however, other small areas of the harbour that potentially remain exposed to future storm surges. For example, there is a low risk that the harbour moles may experience damage in the future, as well as the more temporary berthing platforms in the marinas, with the exception of Queensway Quay Marina where new breakwaters are being constructed.

Future storm surges could also cause flooding and coastal erosion to areas near Camp Bay and Little Bay. These two areas do not contain any buildings but inundation of the land could potentially occur during low probability future storm surges. On the eastern side of Gibraltar, future flooding could potentially impact existing buildings in Catalan Bay and Sandy Bay. These latter two areas are considered to be in the highest risk areas of Gibraltar, although the risk is still considered to be low.

5.2 Significant Flood Risk Areas

The Directive requires that areas where “potential significant flood risks exist or might be considered likely to occur”. The definition of ‘significant’ in relation to flood risks is not, however, provided.

Flood risk is generally considered to be low in Gibraltar, however it should be acknowledged that flood risks exist, and future development and planning should take these risks into account. Therefore, for the purposes of this report, two levels of flood risk have been identified, as defined below:

- Level 1, indicates areas of land that might become inundated during flooding events from storm surges or heavy rainfall, but where significant damage is unlikely to occur;
- Level 2, which indicates significant Flood Risk Areas, as required by Article 5 of the Floods Directive, where potentially significant damage could occur to residential properties, the economy, human health or the environment including cultural heritage.

5.2.1 Level 1 Land Inundation

As discussed above, the flood risks from storm surges are not considered to be significant due to the presence of flood defences and raised ground levels. Flood risks from rainfall are not considered to be significant as this flooding type occurs frequently in Gibraltar and has not previously caused significant effects. However, it is acknowledged that flood risks will continue to occur. Table 5.1 lists areas within Level 1 flood risk areas in Gibraltar, which could potentially be inundated in the future, but are not expected to have significant impacts. Development proposed within these areas should consider potential risks and where required demonstrate the necessary mitigation to safeguard future development from flood damage.



Table 5.1 Level 1 Land Inundation Areas

Location	Flooding Source	Notes
Laguna Estate	Rainfall	Small scale flooding has known to occur in the past due to the combination of low lying impermeable surfaces and inadequate drainage systems. Potential for flooding to occur in the future from the same mechanisms. Flooding has not previously caused significant damage and is not expected to do so in the future.
Wellington Front	Rainfall	Flooding has occurred in the past as a result of inadequate drainage, with the potential for flooding to occur again in the future. Whilst flooding here may cause some traffic disruption, it has not previously caused significant damage and is not expected to do so in the future.
Rosia Road	Rainfall	Roads were flooding in this areas during the October 2008 storm surge event, as a result of heavy rainfall coinciding with the storm. Traffic was disrupted and potential exists for similar consequences if future rainfall events occur of the same magnitude.
Western Beach	Storm Surge	This area was flooded during the October 2008 storm surge. As a result of the Algeciras breakwater now being fully opened and operational, it is not anticipated that flood damage will occur in the future, however there is a low probability of the land being inundated during unprecedented conditions
Harbour Moles	Storm Surge	The harbour moles are constructed as flood defences for the harbour area. The North Mole experienced some structural damage during the October 2008 storm event. Future storm surges have minimal potential of repeating this damage, partly as a result of the Algeciras breakwater being fully opened. However, there is minimal risk of the moles experiencing wave overtopping due to their location in the harbour, however future damage is not anticipated.
Camp Bay	Storm Surge	Parts of the beach at Camp Bay are potentially at low risk of being inundated during future storm surge events. Some flood defences are located here, and there are no buildings that could be affected. The area is highlighted as potentially being inundated by flood water to ensure any future development takes account of flood risks.
Little Bay	Storm Surge	Parts of the beach at Little Bay are potentially at low risk of being inundated during future storm surge events. Some flood defences are located here, and there are no buildings that could be affected. The area is highlighted as potentially being inundated by flood water to ensure any future development takes account of flood risks.
Sandy Bay	Storm Surge	Sandy Bay experienced flood damage to defences during the storm surge event in October 2008, however no residential properties were damaged. The flood defences have now been repaired, and although this area remains at risk to future flooding, the risk is considered to be low.
Catalan Bay	Storm Surge	Catalan Bay experienced flooding during the storm surge event in October 2008, however no properties were damaged as they are elevated above the beach and sea level. Although this area remains at risk to future flooding, the risk is considered to be low.

Surface water flooding has occurred along Queensway and at the Fish Market area in the past, however investigations into drainage solutions are being carried out at Queensway, and new stormwater pumps have been installed at Fish Market. These areas are therefore not included in areas of Level 1 land inundation areas.

As a result of renewed and upgraded defences in the harbour area, flooding is not expected to occur to areas that were inundated during the 2008 surge event. This includes the Europlaza, West View Park and Queensway Marina.

Figure 5.1 also shows areas of Gibraltar potentially at risk of land inundation from flooding.

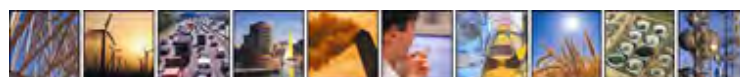


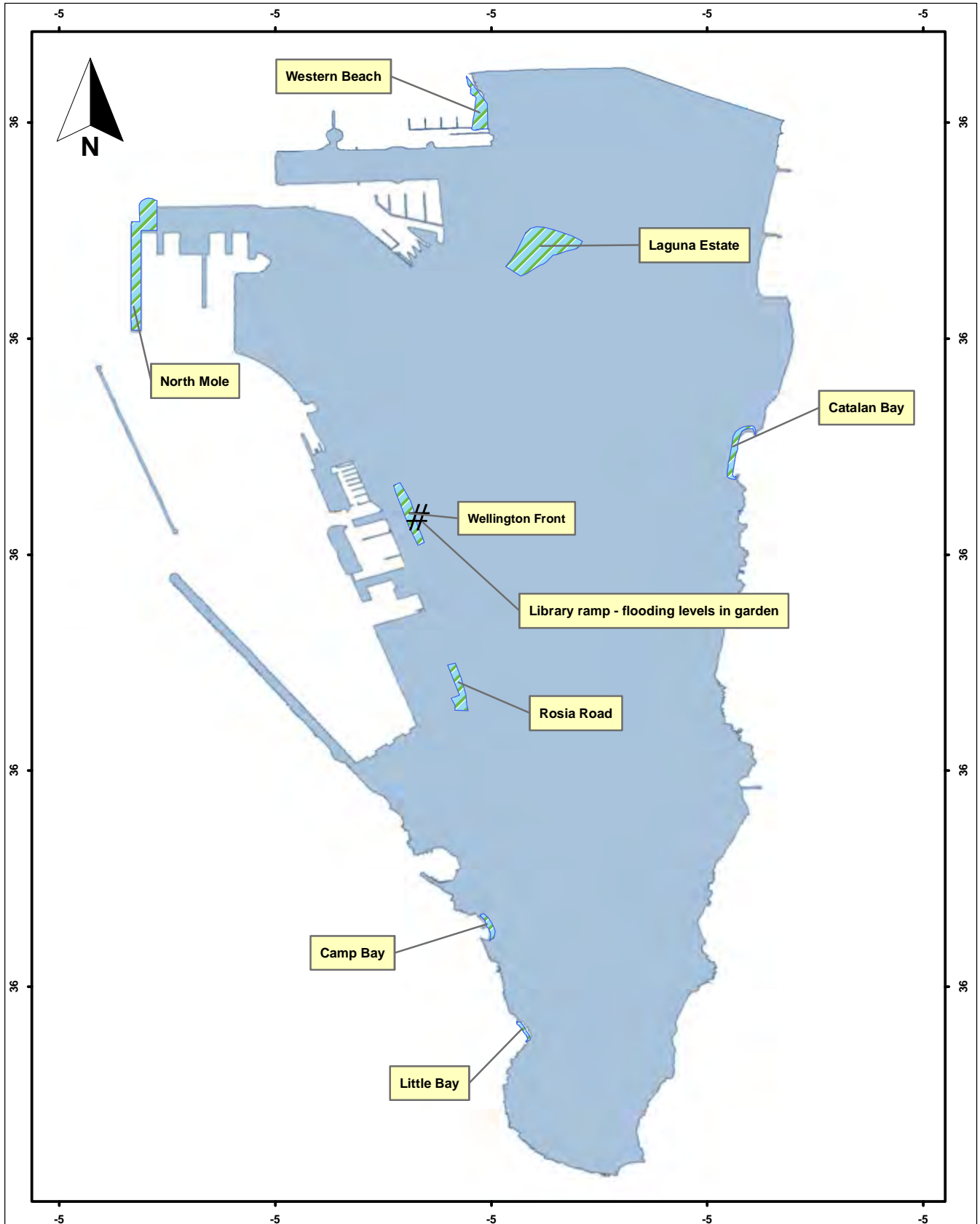
5.2.2 Level 2 Significant Flood Risk

As discussed above in Section 5.1 and 5.2.1, future flood risks in Gibraltar are not considered to be significant. Although significant damage occurred to flood defences and harbour areas during the storm surge event in 2008, flood defences have since been replaced and constructed to a higher level of protection, also taking into account potential sea level rises. Furthermore, the Algeciras breakwater was considered to have contributed to the damage during this event, which reflected the incoming easterly swell towards to Western coastline of Gibraltar. Only some of the above-water perforations on the side of the new breakwater at Algeciras were opened and none of the below water perforations were opened at that time. These perforations are designed to act as wave dampeners and have since all been fully opened so the situation that arose in October 2008 should not be repeated.

Flood risks from rainfall are not considered to be significant as this flooding type occurs frequently in Gibraltar and has not previously caused significant effects.

Section 5.2.1 acknowledges that some areas will potentially experience some degree of flooding in the future, however the impacts are not considered to be significant as significant damage to people, properties, the environment or the economy are not anticipated. There are therefore no Level 2 Significant Flood Risk Areas identified for Gibraltar.






Key:

- # Library ramp
- Areas at risk of land inundation
- Gibraltar coastline, 2011

Gibraltar EU Floods Directive
Preliminary Flood Risk Assessment

Figure 5.1
Level 1 Risk Areas: Areas at Risk of Land Inundation

Project Path:
R:\Data\Projects\HM-255\27593 Gibraltar PFRA\
Drawings\GIS\27593-B03a Figure 5.1 Areas Potential at
Risk of Future Flooding.mxd


 Scale: 1:25000 @ A4
 Geographic Coordinate System - WGS84 Spheroid

January 2011
27593-B03a stokr



6. Summary and Conclusions

This report has been prepared to comply with Articles 4 and 5 of the Floods Directive, which require all member states to undertake a Preliminary Flood Risk Assessment (PFRA), based on available or readily derivable information to assess potential significant risks. This report comprises the PFRA for the Gibraltar River Basin District.

There has been no modelling of flooding for Gibraltar or mapping of potential flood risk areas for the river basin district, therefore the information used in this report has been derived from an assessment of the water bodies in the district and from anecdotal evidence provided at the Inception Meeting with the Department of the Environment.

Gibraltar has experienced numerous floods in recent history, predominantly from storm rainfall events or from storm surges from the sea. Small scale flooding occurs in Gibraltar frequently as a result of rainfall, although with relatively low consequences. Flooding from the sea occurs infrequently in Gibraltar but can have severe consequences when flooding occurs. There are no rivers in Gibraltar therefore no fluvial flood risks are present. Groundwater flooding is unlikely to occur in Gibraltar and there have been no recorded incidents of flooding from this source.

The locations which have experienced flooding in the past are summarised in Table 6.1 below.

Table 6.1 Previous Flooding Incidents

Location	Flooding Source	Description of Flood Event	Significance
Queensway and Wellington Front	Rainfall	The surface water drainage system backs up, and is also subject to some minor collapses in the pipe network. During heavy downpours standing water will accumulate in many places, where there are predominantly impermeable surfaces combined with a potentially inadequate drainage system. A solution to the issue is currently being investigated	There have been no significant consequences to human health, the economy, the environment or to cultural heritage from flooding at this location.
Fish Market and Orange Bastion	Rainfall	The expanse of impermeable surfaces combined with the low lying elevations and a surface water drainage system that relies on pumping stations results in surface water flooding. The pumps in this area connect to the Trunk Sewer and cannot cope with the pumping demands required during episodes of prolonged and intense rainfall	There have been no significant consequences to human health, the economy, the environment or to cultural heritage from flooding at this location.



Location	Flooding Source	Description of Flood Event	Significance
Laguna Estate	Rainfall	Small-scale flooding has taken place in the past during heavy rainfall events due to the combination of the inadequate drainage system and low lying impermeable surfaces.	There have been no significant consequences to human health, the economy, the environment or to cultural heritage from flooding at this location, although some minor impacts on business have previously occurred.
Rosia Road	Rainfall	Heavy rainfall caused flooding on Rosia Road near to Jumper's Bastion which significantly affected traffic movement.	There have been no significant consequences to human health, the economy, the environment or to cultural heritage from flooding at this location.
Europlaza and West View Park	Storm Surge	Car parking areas, recreational areas and some building damage occurred during the October 2008 storm surge in this area, as a result of sea defences being overtopped	There have been no significant consequences to human health, the environment or to cultural heritage from flooding at this location. Significant consequences to the economy resulted from the 2008 event, from the cost of repair and replacement to sea defences.
North Mole, Port Authority & post office building & highway	Storm Surge	Structural damage occurred to the North Mole and to some buildings in this area as a result of the 2008 storm surge event.	There have been no significant consequences to human health, the environment or to cultural heritage from flooding at this location. Significant consequences to the economy resulted from the 2008 event, from the cost of repair to structural damage in this area.
Airport runway	Storm Surge	Structural damage occurred runway as a result of the 2008 storm surge event.	There have been no significant consequences to human health, the environment or to cultural heritage from flooding at this location. Significant consequences to the economy resulted from the 2008 event, from the cost of repair to structural damage in this area.
Western Beach	Storm Surge	Some jetties in this area experienced damage during the 2008 storm surge event.	There have been no significant consequences to human health, the economy, the environment or to cultural heritage from flooding at this location.
Catalan Bay	Storm Surge	Wave action resulted in flooding of this area during the 2008 event	There have been no significant consequences to human health, the economy, the environment or to cultural heritage from flooding at this location.
Sandy Bay	Storm Surge	During the 2008 event, the beach in front of Sandy Bay was completely inundated and sea defences were damaged. The sewage pumping station at this location suffered irreparable structural damage.	There have been no significant consequences to human health, the environment or to cultural heritage from flooding at this location. Some consequences to the economy resulted from the 2008 event, from the cost of repair to structural damage in this area.

The table above demonstrates that the most significant consequences of flooding in Gibraltar occurred during the unprecedented storm in 2008, when flood defences in the harbour area were breached. It is also considered that the flooding was made worse by the Algeciras breakwater, where openings designed to absorb wave energy were not fully opened, resulting in reflection of the storm waves toward Gibraltar.



The openings in the breakwater are now fully operational, therefore future damage from reflected waves is not expected to occur in Gibraltar. Furthermore, the damaged flood defences in the harbour have been reconstructed to a higher level of protection, so that if the same magnitude storm were to occur, the defences would not be overtopped. Significant consequences of flooding are not expected to reoccur in Gibraltar.

In recognition that although significant damage may not occur, but that some areas may experience flooding, a two tiered assessment of flood risk has been undertaken. Figure 5.1 illustrates areas at a Level 1 risk of being inundated from heavy rainfall or storm surges, so that future planning can take account of flood risks. These do not constitute areas of potentially significant flood risk. There are no areas identified in Gibraltar that are within the Level 2 significant flood risk areas.





7. References

Entec UK Limited, Northumbrian Water Ltd, and AquaGib Ltd, 2005, *Gibraltar River Basin District - Initial Characterisation, Summary report of the characterisation, impacts and economics analyses required by Article 5 of the Water Framework Directive*,

Entec UK Limited, February 2008, *Wastewater Infrastructure Overview Strategic Study*, 21054/040/056

Department of the Environment, Government of Gibraltar, 2008, *The Gibraltar Climate Change Programme 2008*







Appendix A Photos

Gibraltar Neanderthals







Plate 1: Queensway and Wellington Front



Plate 2: Wellington Front



Plate 3: Fish Market



Plate 4: Rosia Road



Plate 5: West View Park



Plate 6: Europort Building

Gibraltar Neanderthals

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Entec



Plate 7: Sandy Bay



Plate 8: Catalan Bay



Appendix B

Summary of Wave Studies for Gibraltar Harbour

Gibraltar Neanderthals





Deltares



Memo

To
Gibraltar Land Reclamation Company Limited, attn. H. de Bos

Date	Reference	Number of pages
14 December 2010	1203913-000-HYE-0004	2
From	Direct line	E-mail
Ben de Sonneville	+31 (0)88 33 58 274	ben.desorineville@deltares.nl

Subject
Summary of wave studies for Gibraltar Harbour

Introduction

The storm of 10 October 2008 caused severe damage to the coast of Gibraltar. Following the storm, Deltares was requested to perform an analysis of the storm severity (Deltares, 2008) and to determine the present extreme wave climate with special attention to the influence of wave reflection at the detached breakwater at Algeciras (Deltares, 2009). This document contains a brief summary of the results of above mentioned studies.

Severity of 10 October 2008 storm

In Deltares (2008), the severity of the storm of 10 October 2008 was estimated as follows:

Table 1: Severity of storm of 10 October 2008

Parameter	Return period	Value
Maximum wind speed	40 years	23 m/s (approx. 95°N)
Maximum significant wave height	30 years	6.3 m (approx. 95°N)
Maximum water level	10 years ¹	1.02 m CD

Extreme wave climate

Wave modelling performed in Deltares (2009) revealed that eastern storm conditions (95°N) result in the most severe wave conditions inside the Gibraltar Bay and Gibraltar Harbour, when compared with extreme conditions from other directions. Under these conditions, the resulting wave height is a combination of incoming and reflected wave components. Inside Gibraltar Harbour, local reflections play a large role because of the large number of vertical quay walls. The estimated 1/100 year significant wave heights inside the Gibraltar Harbour ranged between 1.0-3.5m.

Influence of detached breakwater at Algeciras

The effect of the detached breakwater at Algeciras was assessed by comparing wave characteristics in Gibraltar with and without harbour extension, under identical eastern wave conditions. Wave modelling indicated an additional south-western peak in the wave directional spectrum caused by reflection off the new harbour extension, leading to a wave height increase inside Gibraltar Harbour, depending strongly on the location inside the harbour and the status of the caisson chambers at Algeciras (whether they are perforated or not).

During the storm of 10 October 2008, the caisson chambers of the recently constructed detached breakwater at Algeciras were not yet fully operational, i.e. only some of the perforations above the water line were open and none below the water line. Therefore, the




¹ This return period was based on the measured storm surge.



Date 14 December 2010 Our reference 1203913-000-HYE-0004 Page 2/2

reflection coefficient during that storm was estimated to be about 95%, while presently (in fully perforated state) it is estimated to be approximately 70%.

At the northern harbour entrance, the increase in wave height due to the detached breakwater at Alcaciras is presently estimated to be about 20% (with a reflection coefficient of 70%) and is estimated to have been about 30-35% during the storm of 10 October 2008 (with a reflection coefficient of 95%). At the southern entrance, the increase in wave height is presently estimated to be about 10% and is estimated to have been about 20% during the storm of 10 October 2008. Within Gibraltar Harbour, the present increase is estimated to be in the range of 5-40%, with an estimated increase of 5-60% during the storm of 10 October 2008. Within Gibraltar Harbour, the actual increase depends strongly on the location.

Author	Reviewer	Approver
B. de Sonnevile 	S. Calres 	K.J. Bos 

References

Deltares, 2008: Draft results on analysis of 10 October 2008 storm. Prepared for Van Oord.
 Deltares, 2009: West Gibraltar; Extreme wave conditions. Prepared for Van Oord.



GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS

World Heritage Site Nomination

Volume 3: Management Plan



Department
for Culture
Media & Sport



The
Gibraltar Museum



HM Government
of Gibraltar



GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS

World Heritage Site Nomination

Volume 3: Management Plan



Department
for Culture
Media & Sport



The
Gibraltar Museum



HM Government
of Gibraltar





HM Government of Gibraltar

Office of the Deputy Chief Minister



It is a real pleasure to write the foreword for the Management Plan of the nominated UNESCO World Heritage property known as the Gibraltar Neanderthal Caves and Environments. I have been personally overseeing, on behalf of Her Majesty's Government of Gibraltar, the process of the bid. As a result I have seen the progress which has been made since 2012 and I am convinced that we have a site which is not just of outstanding universal value but which also meets UNESCO's criteria of authenticity and integrity.

Gibraltar is a small territory, with many pressures on the limited land available. Yet we have been able to match these demands, along with a high local and visitor population, with the creation of a site worthy of World Heritage status. We have done so, first and foremost, because we have an outstanding cultural resource in the caves and cliffs that make up the property. Secondly, despite our smallness, the property is remote. The high cliffs of the Rock protect the site and ensure its isolation. We have chosen not to rely exclusively on this natural protection and have given legal protection to those parts which did not already have it. The entire site falls within the Gibraltar Nature Reserve as does much of the Buffer Zone.

One of the advantages of being small is relative ease in decision-taking and in the implementation of decisions. This quality has made the nomination process relatively simple and unhindered. Access to stakeholders has also been straightforward and I am pleased that the Steering Committee for the bid has benefited from the advice of many persons, including local non-governmental organisations. These advantages have also helped in the preparation of this Management Plan.

The Management Plan is an essential component of the nomination and a crucial tool that will enable the site to be effectively managed. It is a living document that will have the necessary flexibility to react quickly to the needs and demands of the site.

I am also the Minister with responsibility for Town Planning. Planning is the responsibility of the elected Government of Gibraltar and planning decisions are a matter of our exclusive competence. I attend meetings of the Development and Planning Commission as a voting member. The Commission is a statutory body which is independent of the Government. Its meetings take place in public since 2012 which means that all planning applications and proposals for future development all over Gibraltar are subject to considerable scrutiny by the media and the public.

Both in my official capacity, and also as a historian, I have taken a keen interest in projects and proposals with a historical and heritage dimension. This is one such project that is of value, not only to Gibraltar, but to the whole of humanity.

I will continue to take a keen interest as it comes to fruition.

The Hon Dr Joseph Garcia MP
Deputy Chief Minister
HM Government of Gibraltar

Office of the Deputy Chief Minister

HM Government of Gibraltar • 6 Convent Place • Gibraltar GX11 1AA

t +350 20051983 f +350 20059271 e ernest.francis@gibraltar.gov.gi w gibraltar.gov.gi

Acknowledgements

This nomination has been produced by the Gibraltar Museum on behalf of HM Government of Gibraltar, and the Gibraltar Neanderthal Caves and Environments World Heritage Steering Group.

Further copies of this Nomination may be obtained from:

The Gibraltar Museum

18-20 Bomb House Lane
Gibraltar

Tel. + 350 200 72489

Fax. + 350 200 79158

E-mail: clive.finlayson@gibmuseum.gi

<http://www.gibmuseum.gi>

The World Heritage Bid has been led by the Gibraltar Museum. Other organisations and departments on the World Heritage Steering Group are: the Office of the Deputy Chief Minister, the Department of the Environment, the Town Planning Department, Technical Services Department, Gibraltar Tourist Board, University of Gibraltar, Gibraltar Nature Conservancy Council, the Gibraltar Botanic Gardens, Gibraltar Heritage Trust, Gibraltar Ornithological and Natural History Society, English Heritage representing HM Government UK Department for Culture, Media and Sport, and HM Government UK Ministry of Defence.

Members of the International Research and Conservation Committee comprise the Doñana Biological Station, World Heritage Site, Spain; the University of Haifa and Mount Carmel World Heritage Site, Israel; University of Louvain, Belgium; University of Tarragona and Atapuerca World Heritage Site, Spain; and the University of York, United Kingdom.

In addition to stakeholders mentioned above, the preparation of the bid has benefited from advice from ICOMOS-UK and the UK National Commission from UNESCO.

Table of Contents

Executive Summary	11
1. Introduction	13
2. The vision	15
3. The site and its values	16
3.1 Location and topography	16
3.2 Gibraltar Neanderthal Caves and Environments	19
3.3 The site in its Gibraltar context	21
3.4 Gorham's and Vanguard Caves	27
4. A natural laboratory and archive	28
4.1 The submerged coastal shelf and coastal oases	30
5. Attributes that give the site its Outstanding Universal Value	33
5.1 Attributes which carry the property's OUV	33
5.2 Associative attributes	36
6. Additional values of the site	37
6.1 Historical and spiritual	37
6.2 Military heritage	39
6.3 Museum and archival collection	39
6.4 Natural	39
6.5 Research	41
6.6 Educational	41
6.7 Tourism and economic	41
7. Why the site is worthy of nomination for World Heritage Status	42
7.1 Criteria under which the site is proposed	42
7.2 Site integrity	43
7.3 Site authenticity	44
8. Current state of the property	45
8.1 The nominated World Heritage property	46
8.2 State of the conservation of the nominated property's buffer zone	49
8.3 The wider setting	52

9. Vulnerabilities and threats	54
9.1 Human-induced vulnerabilities: development pressures, access, archaeological works and vandalism	54
9.1.1 Within the nominated World Heritage property	54
9.1.2 The buffer zone	56
9.2 Environmental pressures and natural disasters	57
10. Policy objectives for the plan period	59
11. Safeguarding the site and its values	60
11.1 Ownership	60
11.2 Legal protection and community involvement	62
11.3 Access and security	64
11.4 Health and safety and environmental protection	65
11.5 Managing risk	65
12. Fostering the gathering and dissemination of scientific information	65
13. Local community involvement	67
14. Visitors and tourism	69
15. Social media and remote access to information	76
16. Enhanced educational and lifelong learning activities	77
17. Contributing to sustainable development in the Gibraltar context	78
18. Promoting and supporting UNESCO's aspirations in sustainable development	79
19. Exemplary World Heritage Site management	79
20. Governance and management	80
20.1 Governance structure for Gibraltar Neanderthal Caves and Environments	80
20.1.1 Composition of Advisory Forum	82
20.1.2 International Research and Conservation Committee membership	83
20.1.3 Current structure for the candidate World Heritage Site team based at the Gibraltar Museum	84
20.1.4 Skills and expertise available	84

21. Works plan 86

22. Monitoring effectiveness 96

Appendix 1: Draft statement of Outstanding Universal Value: core statement for future monitoring

Appendix 2: Risk preparedness plan 105

Appendix 3: Town Planner’s (November 2014) draft amendments to the development plan to take the nominated property into account 126

Executive summary

The United Kingdom Government, as the State Party to UNESCO, is putting forward on behalf of HM Government of Gibraltar, "*Gibraltar Neanderthal Caves and Environments*" for World Heritage Site status in January 2015. A decision will be made in summer 2016 by the World Heritage Committee. World Heritage Sites are places of Outstanding Universal Value (OUV) to the whole of humanity, so exceptional as to transcend national boundaries.

The Gibraltar Neanderthal Caves and Environments property is essentially a Neanderthal occupation site, used between c. 125,000 and 30,000 years ago, that retains features and functions which have persisted to the present day. The coastal plain which, along with the cliffs, was the hunting ground of the Neanderthals is currently submerged but would have been dry land for long periods except in high-level sea stands during inter-glacial periods, and during the past 10,000 years. The landscape today, with the current sea level position and the submerged shelf, would have been similar to the inter-glacial Neanderthal landscape of 125,000 years ago. Gibraltar Neanderthal Caves and Environments are of major significance in understanding the global story of human evolution and adaptation. Gibraltar provides a unique opportunity for people to experience the environments that were present 100,000 years ago and to appreciate the nature, abilities and lifestyle of the Neanderthals. Twenty-five years of a remarkable international, multi-disciplinary research project have revealed the vital importance of the site in our understanding of a critical juncture in human evolution and of the Neanderthals in particular. Of special importance is the evidence for their behaviour and for their landscapes.

The property covers an area of 28ha, with a buffer zone of 341ha. Together these constitute over 40% of the territory of Gibraltar. The site rises from sea level, where two caves, Gorham's and Vanguard, form the principal components of the site, to the highest point of the Rock at 426m AOD. Topography and abrupt relief make it remarkably remote and well-protected. It retains its authenticity and integrity, a testament to its natural resilience. The general state of conservation of the property and its buffer zone is very good.

A property of such intrinsic importance within the small territory of Gibraltar with its high population density (c. 30,000 inhabitants; and a further 12 million visitors per year), requires careful and sympathetic management. The aim of this management plan is to support the site's legal protection and ensure, first and foremost, the continued survival of this exceptional site for the benefit of present and future generations. It sets out the principles and mechanisms for the sustainable protection, interpretation, presentation and management of the site and its values during the period of preparation, nomination and evaluation as a World Heritage Site and, should the site be inscribed in 2016, the first three years as a World Heritage Site. The plan covers the five-year time frame April 2015-March 2020, but will be revised annually so that it will remain a five-year management plan on a rolling programme.

The management plan sets down a vision for the future which underpins strategies and actions proposed. The vision sees the property acting as a catalyst and a flagship for the active conservation management of the wider heritage of Gibraltar, including an important driver for economic diversification of the tourism sector and a keystone for the teaching of history, natural history and heritage at all levels. It is hoped that it can bring the community together under a common aim, reinforcing cultural distinctiveness, identity and social inclusion, and sustainable development, and become an exemplary model of integrated heritage management. The research which has given so much information on Neanderthal and early modern human behaviour and environments is the foundation for

understanding and active conservation and interpretation. Research is a central tenet of this vision and will continue as the kingpin in the whole project. But it is essential that the research programme takes due note of the conservation responsibilities for the site, balancing the need to excavate and add to knowledge with that of preserving deposits for the future, and guided by an agreed research framework.

The vision is supported by policy objectives which flow through proposed approaches, work plans, monitoring and management systems. Their effectiveness will be reviewed and reported annually. Key objectives include safeguarding the property's Outstanding Universal Value; gathering and disseminating information about the site and its values; and welcoming local people and visitors to the site at levels which it can sustain – local community involvement is crucial. OUV only has meaning if it is embedded in the local ecology and is in harmony with local communities. It must have perceived and real benefits.

The responsibility for ensuring the implementation of the policy objectives rests ultimately with the World Heritage Site Director, assisted by a dedicated team each with specific roles. The project is overseen by a steering body – the Advisory Forum, chaired by the Deputy Chief Minister and with representatives of all key departments and the community. Representatives of the UK Government are also invitees to the Forum, as the State Party to UNESCO.

The nomination for World Heritage status provides opportunities for Gibraltar and Gibraltarians, and this Management Plan seeks to articulate ways of developing some of those opportunities, irrespective of whether the site is inscribed on the World Heritage List. Such opportunities include economic improvement - job creation through tourism and heritage management, building local skills and capacity, as well as education opportunities and international profile.

But the nomination also brings challenges. Amongst these will be ensuring public benefit from investment in cultural heritage, ensuring a fully-integrated sustainable approach to heritage management, planning and tourism, viewing cultural heritage as a source of pride and a driver of change rather than a barrier to change, infrastructure and transport needs, resources and skills availability and not least funding in an increasingly-pressured economic environment.

None of these are insurmountable; in a compact place with good communication they may well be more easily overcome than in many places. But effort and investment will be needed to ensure that the benefits are clear to all. Good communication and working in partnership are essential.

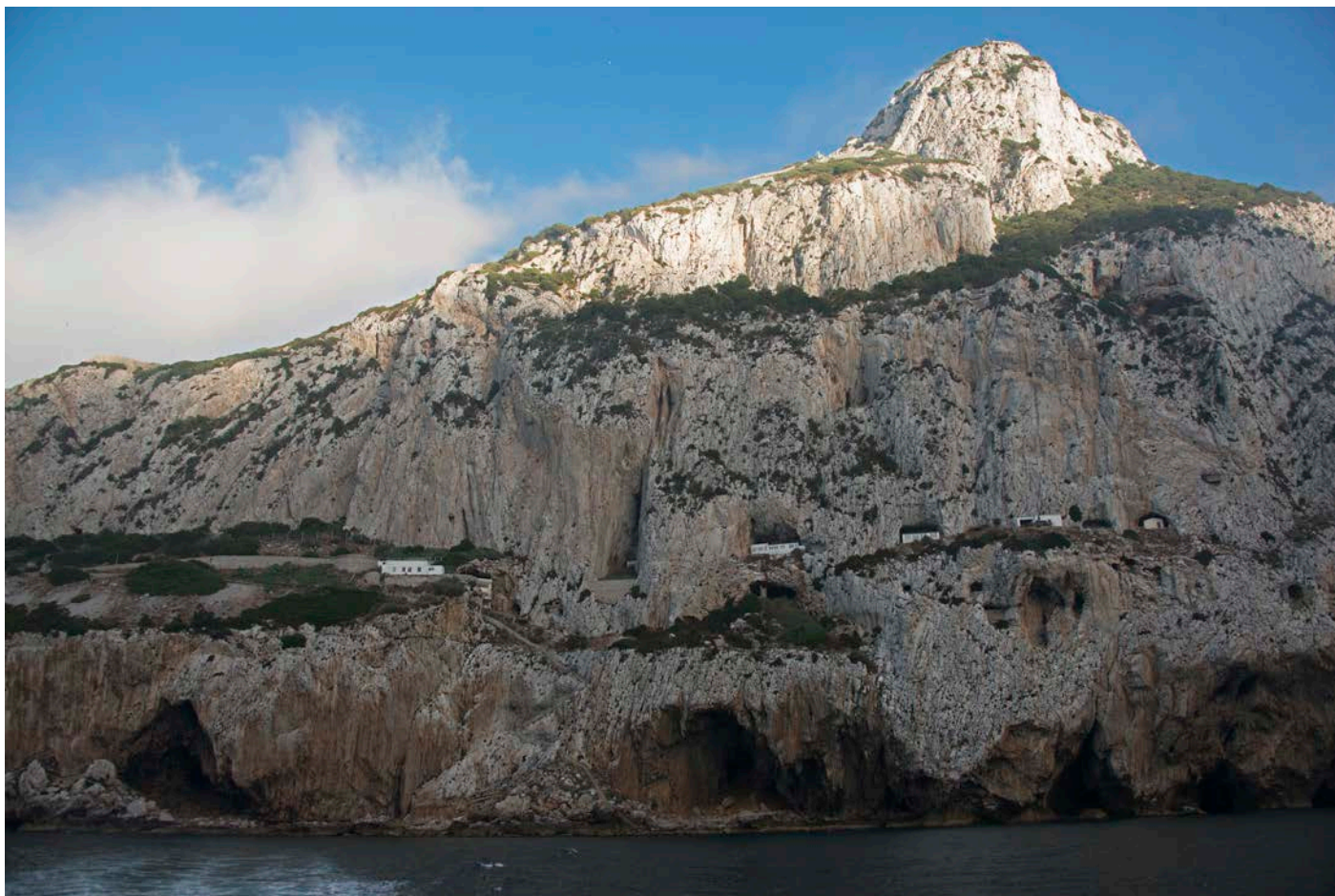


PLATE 1 The candidate site encompasses an area of 28ha, with a buffer zone of 341ha.

1. Introduction

The United Kingdom Government, as the State Party to UNESCO, is putting forward, on behalf of HM Government of Gibraltar, the site known as “*Gibraltar Neanderthal Caves and Environments*” for World Heritage Site status in January 2015. World Heritage Sites are places of Outstanding Universal Value (OUV) to the whole of humanity - of such exceptional cultural or natural significance as to transcend national boundaries. They illustrate the influence of ideas, the environment, economy and geography in shaping the evolution of peoples and nations; they have world-wide relevance. The long-term protection of the world’s cultural and natural heritage is of high importance to the present generation, who are also the custodians on behalf of future generations. To this end HM Government of Gibraltar (HMGoG) is committed to the identification, protection, conservation, and presentation of its candidate World Heritage Site and also to the transmission of its values to future generations. This is reflected in HMGoG’s strategic priority to protect and enhance the quality of the natural and historical environment for all to enjoy. World Heritage Sites contribute to a national and local sense of community and identity as well as to sustainable economic development and regeneration. World Heritage Convention listing will confirm and further the importance of the Gibraltar Neanderthal Caves and Environments on an international scale (see the Statement of Outstanding Universal Value, Appendix 1).

The candidate site encompasses an area of 28 hectares (ha), with a buffer zone of 341ha. Together, property and buffer zone constitute 40.7% of the territory of Gibraltar. A property of such intrinsic importance, set within a territory which has a high population density (c. 32,700 inhabitants and a further 12 million visitors per year), requires careful and sympathetic management.

In spite of its proximity to a high density of population, the candidate site's topography and abrupt relief make it remarkably remote and well-protected. Gibraltar has endured 14 military sieges and has seen two world wars. In spite of this activity, the site retains its authenticity and integrity, a testament to its natural resilience. The aim of this management plan is to support the site's legal protection and ensure, first and foremost, the continued survival of this exceptional site for the benefit of present and future generations.

The past 25 years have seen the development and growth of a remarkable research project, based around Gorham's Cave but encompassing the entire candidate site. This international, multi-disciplinary, project has brought together local and international scientists from an array of over 40 academic institutions, who have seen and understood the unique and exceptional universal value of the site and its contents as well as its huge potential for further research. As the project has developed, and the caves in particular have revealed their secrets, the full realisation of the universal value of the site has become clear. This vital importance of the site in our understanding of a critical juncture in human evolution and of the Neanderthals in particular, is patent from the extensive list of publications in major international peer-reviewed journals that have come out of this work so far. A major strength of the site is in its potential for future research. The deposits in Gorham's and Vanguard Caves alone are of such depth that research is guaranteed for several generations of scientists. But it is equally essential that the research programme takes due note of the conservation responsibilities for the site, balancing the need to excavate and add to knowledge with that of preserving deposits for the future.

The management plan takes this and other important needs into account – not least making information about the site publicly available - and does so with a vision towards the future. The plan covers the five-year time frame April 2015-March 2020, but will be reviewed annually in the light of progress so that it will remain a five-year management plan on a rolling programme. The aim of this Management Plan is therefore to outline the principles and mechanisms for the sustainable protection, interpretation, presentation and management of the site and its values during the period of preparation, nomination and evaluation as a World Heritage Site and, should the site be inscribed in 2016, the first three years as a World Heritage Site.

The purpose of the plan is therefore:

- to describe the extent of the site, with its buffer zone and setting;
- to describe its significance and key attributes and explain how these give the site its Outstanding Universal Value;
- to set down how the site is protected and identify key management issues; and
- to outline the consequent policies and strategic actions which will meet the obligations of the World Heritage Convention.

This Management Plan has been drawn up in discussion with the key agencies, stakeholders and other groups with an interest in the future of the candidate World Heritage Site and the values which it represents.

2. The vision

The site's management priorities are set in this plan in the context of the responsibilities set out in the 1972 UNESCO Convention on the Protection of Cultural and Natural Heritage and with a long-term core vision which is set for a 10-year time frame. This five-year plan is to be understood in the context of that wider framework.

The Vision for the World Heritage Site is expressed in the following statement:

We believe that protecting, conserving and enhancing the Outstanding Universal Value of the Gibraltar Neanderthal Caves and Environments candidate World Heritage Site will act as a catalyst and flagship for the conservation and protection of the wider heritage of Gibraltar and will bring the community together under a common aim, reinforcing cultural distinctiveness, identity and social inclusion, and sustainable development.

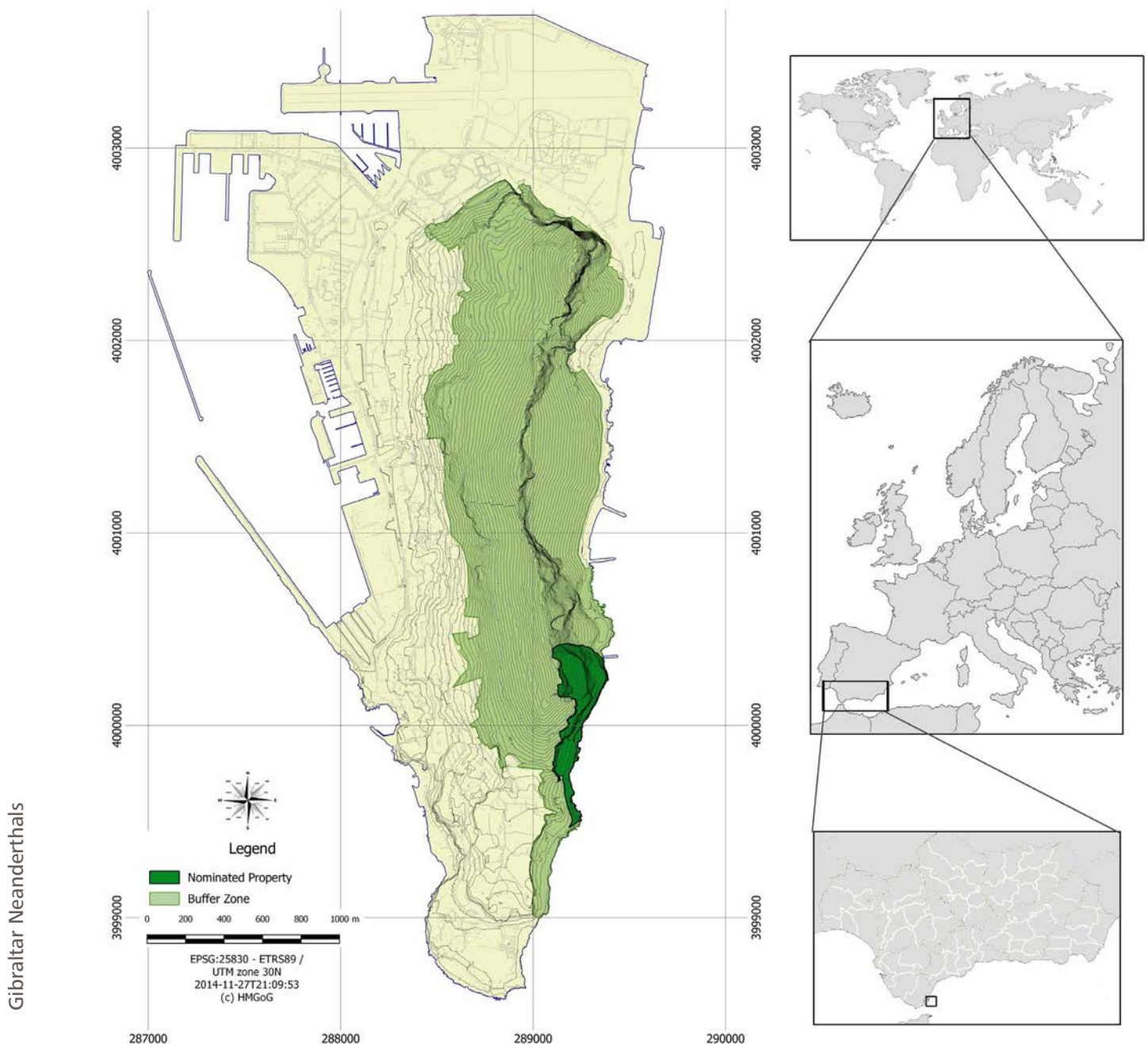
It is an important driver for economic diversification of the tourism sector and a keystone for the teaching of history, natural history and heritage at all levels. Given the size and compactness of Gibraltar, permitting the rapid diffusion of information and community involvement at all levels, we believe that the project can become an exemplary model of integrated heritage management.

We recognise that the universal importance of the site has come to light as the direct result of 25 years of scientific research, including archaeological excavations, at the site. The continuing research at the site therefore forms the basis for understanding it and for being able to conserve and interpret it fully. Research is the kingpin in the whole project and its importance, and the need to support it is a central tenet of this vision.

3. The site and its values

3.1 Location and topography

The nominated property lies on the eastern side of the Rock of Gibraltar, on the south-western tip of the Iberian Peninsula and only 21 kilometres (km) from the coast of North Africa. The Rock marks the north-eastern limit of the Strait of Gibraltar which connects the Mediterranean Sea with the Atlantic Ocean. The Rock is therefore situated in the heart of a major geographical nexus, where two continents and two large bodies of water meet. It has been known since classical times as the northern Pillar of Hercules - *Mons Calpe*. Together with Jebel Musa (*Mons Abyla*, the other Pillar) on the Moroccan coast opposite, it has been a universally recognisable silhouette and one of the Earth's major landmarks to mariners for millennia.



Gibraltar Neanderthals

FIGURE 1 Map of the candidate World Heritage Site, showing its position in Europe.

The Rock is c. 6km in length and 1.5km in width and rises sharply from the sea to a maximum altitude of 426m at its southern peak, which is within the candidate World Heritage Site. To the north, the Rock is linked to the mainland by a sandy, now largely built-up, tombolo and to the west it is delimited by the City and Bay of Gibraltar. The eastern coastline, largely adjacent to or part of the property faces the Mediterranean Sea. The Rock's southernmost cliffs, at Europa Point, face the Strait of Gibraltar and the African continent beyond. The Rock is a beautifully-preserved geomorphological feature with an exceptional stratigraphic record of the tectono-eustatic evolution covering the Pliocene and Pleistocene (5.33 million to 10,000 years ago)

The cliffs of the Rock of Gibraltar constitute an unspoilt record of the Earth's climatic history and are additionally of exceptional beauty, having been captured by many painters of the 18th and 19th centuries. As such they are a major component of the symbolic image of "the Rock" and have been the recognisable feature and beacon to mariners approaching from the Mediterranean Sea since at least the seventh century BCE. They comprise the entire eastern face of the Rock and fall within the candidate World Heritage Site or its buffer zone.

The nominated property is an area of the Rock largely unaffected by modern development. It extends from sea level to the top of the Rock at 426m AOD and is covered by natural vegetation. The site is traversed by a pathway, the Mediterranean Steps, parts of which date to the 19th Century. At its southern extremity, it includes a short stretch of modern road. Apart from this the only man-made features are a small number of historic military structures such as gun and searchlight batteries and some associated buildings, themselves of historic interest. There are no occupants within the candidate world heritage site, and only c. 50 in the wider buffer zone. Land is either owned by HMGoG or the UK Ministry of Defence.

The candidate site's boundaries are clearly visible as natural topographical boundaries. They delimit all the attributes that confer outstanding universal value and follow natural topographical features which encompass the five major morpho-tectonic units of the Rock of Gibraltar. The eastern boundary is delimited naturally by the Mediterranean coastline. At the southern end the boundaries start at sea level immediately south of and below the First and Second Europa Advance Batteries, rising vertically to take in the Batteries and following along the Europa Advance Road wall to the Hole-in-the-Wall gate. The boundary runs across the gate and then follows natural cliff lines below Levant Battery to the highest point at the top of the Rock. The western boundary is delimited by the ridge of the Rock turning east where its northern boundary follows a steep topographical discontinuity ('gully') in the contours to the top of the Dudley Ward Tunnel entrance and reaching sea level again south of the Ammunition Jetty.

A buffer zone has been defined to protect the key elements of the candidate site. Its boundaries are coincident with those of the legally-protected Nature Reserve to the north and west. At the southern end the boundary again lies within the Nature Reserve but is delimited by the natural cliff below Windmill Hill Flats, rather than the Reserve Boundary.



PLATE 2 The cliffs of the Rock of Gibraltar constitute an unspoilt record of the Earth's climatic history and are additionally of exceptional beauty.



PLATE 3 The candidate site's boundaries are clearly visible as natural topographical boundaries. They delimit all the attributes that confer outstanding universal value and follow natural topographical features which encompass the five major morpho-tectonic units of the Rock of Gibraltar.

3.2 Gibraltar Neanderthal Caves and Environments

The nominated property is essentially a Neanderthal occupation site that retains features and functions which have persisted to the present day. The coastal plain which, along with the cliffs, was the hunting ground of the Neanderthals is currently submerged but would have been dry land for long periods except in high-level sea stands during inter-glacial periods, and during the past 10,000 years. This means that the observable landscape of today, with the current sea level position and the submerged shelf, would have been similar to the inter-glacial Neanderthal landscape of 125,000 years ago (Plate 4).

The Neanderthal was a lineage of the genus *Homo* which is regarded by some students as a separate species *Homo neanderthalensis* and by others as a sub-species of *Homo sapiens*. The Neanderthal lineage split from the modern human lineage sometime around 400,000 years ago and occupied vast areas of Eurasia. No Neanderthal remains have been found in Africa. The Neanderthals were adapted to open woodland landscapes where they could exploit a wide range of resources. During cold glacial periods, much of their range became inhospitable and Neanderthals survived in the southern peninsulas: in Iberia, Italy, the Balkans and Crimea. Southern Iberia, particularly the coastal south-west around Gibraltar had the most benign climate because of the tempering influence of the Atlantic Ocean, distance from the high mountain glaciers and high latitudes. It was here that Neanderthals persisted without interruption for almost the entire last glacial cycle, the Late Pleistocene, between 123,000 and 10,000 years ago.

The earliest evidence of modern humans outside Africa is in the Middle East where a first appearance is recorded around 130,000-100,000 years ago. Today we know that the two lineages interchanged genes with a Neanderthal contribution of between 1.5 and 2.1% to people of European ancestry. In spite of the close proximity of modern human and Neanderthal populations, facing each other across the Strait of Gibraltar there is currently no evidence to support maritime contact between the two populations. It would take modern humans another 100,000 years to reach the northern shore of the Strait of Gibraltar, spreading from east to west across Europe from the Middle East. By the time modern humans reached this region, the Neanderthals were extinct.

The Gibraltar candidate World Heritage Site complements the Mount Carmel World Heritage Site in Israel, the only site currently on the World Heritage List that represents the Neanderthal lineage. Mount Carmel records the first contact between Neanderthals and modern humans between 130,000 and 100,000 years ago whereas Gibraltar marks the end of the process 100,000 years later.

Additionally, and most importantly, Gibraltar offers us a very detailed record of how Neanderthals lived and survived in isolation at a time when modern human-Neanderthal contact was taking place in other parts of the world. The behaviour of the Neanderthals in Gibraltar cannot therefore be attributed to any process of acculturation due to contact with modern humans. Gibraltar is therefore crucial to our understanding of the Neanderthals and the world in which they lived.



Gibraltar Neanderthals

**PLATE
4**

The coastal plain which, along with the cliffs, was the hunting ground of the Neanderthals is currently submerged but would have been dry land for long periods except in high-level sea stands during inter-glacial periods, and during the past 10,000 years. Photo is a reconstruction based on original data from the site.



PLATE 5 Most importantly, Gibraltar offers us a very detailed record of how Neanderthals lived and survived in isolation.

3.3 The Site in its Gibraltar Context

The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and caves on the Rock of Gibraltar on its eastern side, bordering the Mediterranean Sea. Within the Rock itself, 213 caves have currently been catalogued and 46 are within the candidate World Heritage Site. Nine caves and rock shelters within the Rock have evidence of Neanderthals (Figure 2). Seven sites within the candidate property include the most significant Palaeolithic deposits; four are representative of the Middle Palaeolithic (Neanderthals) and four of the Upper Palaeolithic (modern humans); Gorham's Cave has evidence for both lineages, hence there are only seven caves. The four Neanderthal occupation sites – Gorham's, Vanguard, Bennett's and Hyaena Caves - included in the proposed World Heritage Site, constitute an exceptionally high density (1.4caves/10 ha). Each of these caves has a sequence of sediments which is largely geological, of great depth and deposited over a great time span. The sediments contain successive levels showing evidence of human occupation in the form of artefacts, processed bones, hearths and paintings. Hence these caves have generated a large body of evidence of the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique and exceptional examples of the exploitation of birds and marine mammals for food. Two of the caves – Gorham's and Vanguard - have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. These have been excavated systematically over the past 25 years but the vast deposits remain largely intact and retain huge potential.



PLATE 6 Two of the caves – Gorham’s (centre) and Vanguard (right) - have provided exceptional evidence.

Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m, from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea level rise and fall, some caves now being partly submerged and others offshore lying in the sea bed. Exceptionally, given the abrupt relief, some caves – most notably Gorham’s and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years.

The property’s principal components are two large sea-level caves – Gorham’s and Vanguard - which contain an exceptional archaeological and palaeontological record of Neanderthal occupation over a period of approximately 100,000 years. It is the longest and most detailed record of their way of life that is currently available. This outstanding record includes elements which are found nowhere else in the world and have changed our perception of the Neanderthals, their capacities and culture. This is the Neanderthals’ defining site. The caves are situated at the base of an impressive cliff that provides additional caves and shelters, cliff vegetation, avifauna, intertidal invertebrate communities and tectono-eustatic features, including raised beaches and fossil dunes.

The 46 caves within the candidate property are set in a landscape that was home to the Neanderthals for 100,000 years, and can be classified into two clusters (Table 1):

A Gorham’s Cave Complex - 28 caves at the base of the southern peak of the Rock of Gibraltar between sea level and +60m AOD. The caves are situated within the most recent (250,000 years ago to present) morpho-tectonic unit of the Rock; and

B Main Cliff, Southern Peak - 18 caves on the cliffs of the southern peak of the Rock of Gibraltar, between +60 and 426m AOD

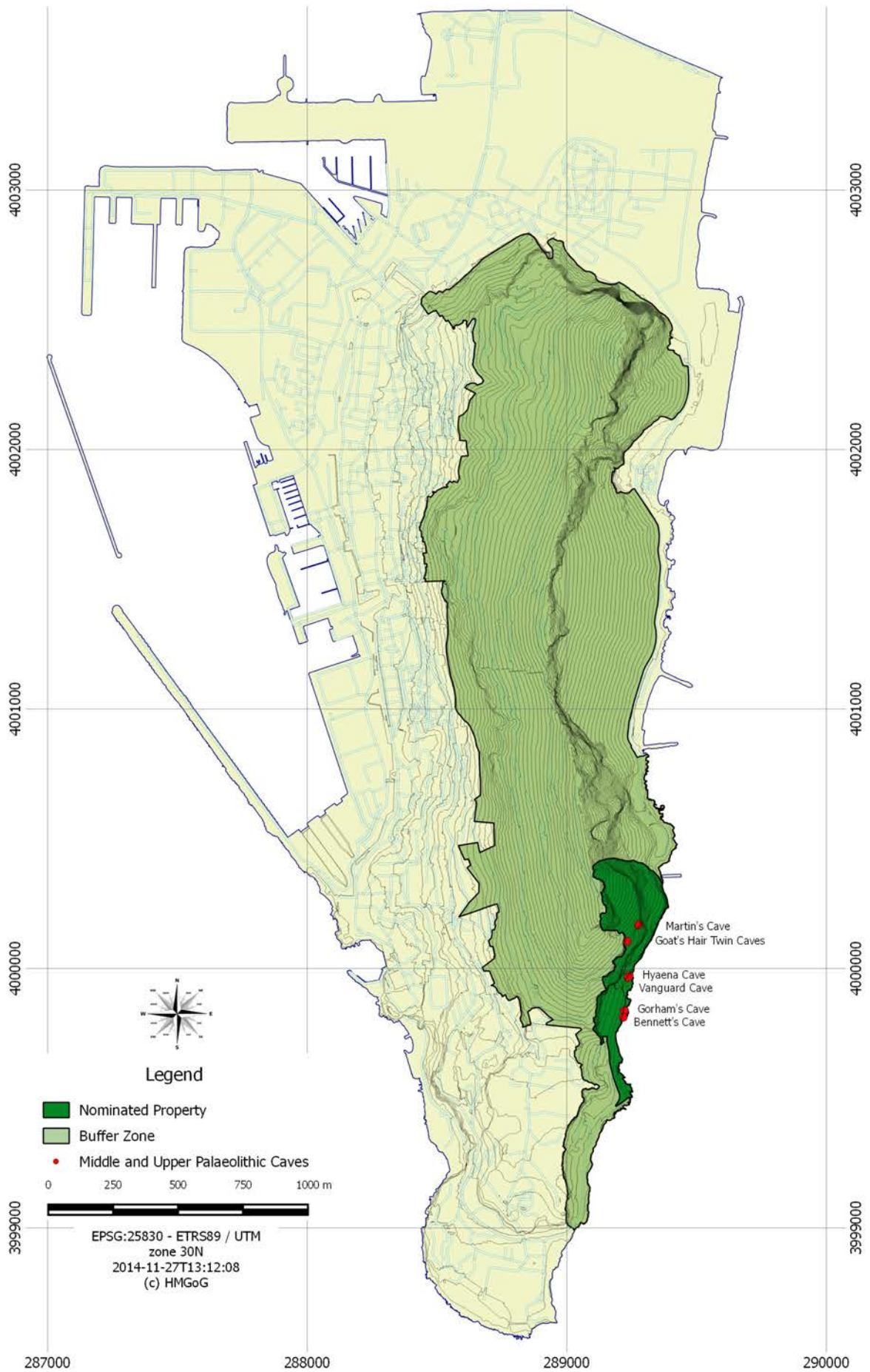


FIGURE 2 Neanderthal archaeological and fossil sites inside and outside the nominated World Heritage Site.

There are a further 8 known caves in the Buffer Zone on the cliffs below the central ridge of the Rock of Gibraltar, above the Catalan Bay Sand Dune, between 290 and 385m AOD. These include Ibx Cave which was a Neanderthal hunting station and butchery site and Sewell's Cave with evidence of Upper Palaeolithic occupation (Figure 2).

Twenty-eight coastal, submerged or partly submerged caves within the Gorham's Cave Complex would have also been occupied or visited by the Neanderthals and modern humans as they have similar topographical characteristics and lie close to the other caves. Sea level rise 10,000 years ago washed away any archaeological deposits (although small pockets of sediment remain in fissures) in many of these but they nevertheless complement the archaeological caves in allowing an understanding of the function of a group of caves at sea level – the Gorham's Cave Complex - that was the home of the Neanderthals. In effect, the caves (including those that no longer offer archaeological evidence because of sea-level rise) cluster to form an exceptional example of a Neanderthal settlement.



PLATE
7

There are a further 8 known caves in the Buffer Zone on the cliffs below the central ridge of the Rock of Gibraltar, above the Catalan Bay Sand Dune.

TABLE Caves located within the candidate World Heritage Site**1**

Reference Number	Cave Name	Area ¹	Cultural attribution ²	Remarks
1	Unnamed 1	A		submerged
2	Coptic	A	Pt, PMH	potential ³
3	South	A		
4	Bennett's	A	MP, Pt	potential
5	Gorham's	A	MP, UP, N, Pt	potential
6	Vanguard	A	MP	potential
7	Hyaena	A	MP	potential
8	Finlaysons'	A		
9	Boat Hoist	A	PMH	pt. submerged
10	Cormorant	A		pt. submerged
11	Sandy Lower	A		pt. submerged
12	Gunn's	A		
13	Smith's	A		
14	Winkie's	A		
15	Swallow Nest	A		
16	Marble Arch	A		pt. submerged
17	Unnamed 3	A		pt. submerged
18	Unnamed 4	A		pt. submerged
19	Unnamed 5	A		pt. submerged
20	Unnamed 6	A		pt. submerged
21	Unnamed 7	A		pt. submerged
22	Unnamed 8	A		pt. submerged
23	Unnamed 9	A		pt. submerged
24	Smuggler's	A		
25	Monkey's	A	PMH	
26	Sandy Upper	A	PMH	
27	Dickson's	A	PMH	
28	Columba	A		
29	Martin's 1	B	UP, N, Me, PMH	potential
30	Martin's 2	B		
31	Fig Tree No2	B		potential
32	Martin's Guard No1	B	PMH	
33	Martin's Guard No2	B	PMH	
34	Spider	B		
35	John's Giant	B		
36	Reservoir No5	B		
37	Reservoir No4	B		
38	Mediterranean	B	PMH	
39	Collins's	B	N	potential
40	Goat's Hair No1	B	UP, N	potential
41	Goat's Hair No2	B	UP, N	potential
42	Unnamed 10	B		
43	Unnamed 11	B		
44	Unnamed 12	B		
45	Unnamed 13	B		
46	Unnamed 14	B		

¹ A – Gorham's Cave Complex; B Main Cliff, Southern Peak;² MP – Middle Palaeolithic, UP – Upper Palaeolithic, N – Neolithic, Pt – Protohistoric, Me – Medieval, PMH – Post-medieval Historic³Potential in the remarks column means that the cave has potential for further excavation

Our understanding of the Neanderthal world is enhanced by the sheer cliffs and scree slopes that are incorporated within the property. These are major topographical features, within which the caves are embedded, that provide a vivid and exceptional spatial context of a place that was the home of the Neanderthals for 100,000 years. The dunes along with raised beaches that reach up to 210m AOD and the chronological sequences within the caves themselves, provide an unrivalled temporal context of tectonic and climate change that spans the entire Pleistocene. The caves, cliffs and related geological formations thus offer an exceptional window into the world of the Neanderthals in a spatial and temporal framework that is unrivalled.

In addition to the physical attributes of the site, there are biological components that enhance the picture even further. Vegetation – comprising species which have been present since the time of the Neanderthals - is distributed across the limestone cliffs from sea level to the highest point. Birds utilise the property for breeding or as a migration stop over between Europe and Africa as they did when the Neanderthals occupied the site. A well-preserved and protected intertidal invertebrate community and an offshore presence of cetaceans adds colour to the range of fauna that the Neanderthals are known to have exploited at this site. Nowhere in the world can we understand the world of the Neanderthals and how it functioned, as we are able to do on Gibraltar.



Gibraltar Neanderthals

PLATE 8

In addition to the physical attributes of the site, there are biological components that enhance the picture even further. Vegetation – comprising species which have been present since the time of the Neanderthals - is distributed across the limestone cliffs from sea level to the highest point. Birds utilise the property for breeding or as a migration stop over between Europe and Africa as they did when the Neanderthals occupied the site.

TABLE 2 Caves within the candidate World Heritage Site by cultural attribution and cluster.

Cultural attribution	Number of caves		
	Cluster A Gorham's Cave Sea level Complex	Cluster B Southern Peak, Main Cliff, between +60 and 426 m AOD	Total
Middle Palaeolithic - Neanderthal	4	0	4
Upper Palaeolithic – modern human	1	3	4
Neolithic	1	4	5
Protohistoric	3	0	3
Medieval	0	1	1
Post-medieval Historic	5	4	9

3.4 Gorham's and Vanguard Caves

Gorham's and Vanguard Caves are the most important caves within the complex (Plate 9). Gorham's is a large sea cave and is the largest with a depth of 92m. At the back of the cave there is a chamber that extends further by 35m, giving the cave a total depth of 127 m. The cave has a height of 40m and width of 70m at its entrance. The depth of archaeological and palaeontological sediments is 18m and the stratigraphic record at Gorham's Cave has revealed that Neanderthals occupied this site between 120,000 and 32,000 years ago, right to the end of their existence. The sequence of deposits includes occupation levels of low intensity and few artefacts, others with high intensity of occupation including hearths and others that appear unoccupied. Gorham's Cave thus appears to have been occupied intermittently by Neanderthals and hyaenas. The greater part of the sequence in Gorham's (approximately 95% of the deposits) is represented by Neanderthal occupation as is the entire sequence at Vanguard Cave.

Vanguard Cave complements the Gorham's Cave Neanderthal occupation sequence, spanning the time frame 127,000-75,000 years ago, in 17m of sediment. This cave has a depth of 41m but may actually be deeper as the sediments currently fill the cave. Vanguard Cave has a height of 35m and a width of 35m at its entrance. Approximately 70% of the archaeological deposits at Gorham's Cave, 90% of those at Vanguard Cave and 100% at Bennett's Cave remain unexcavated.

In addition to the long chronology, Gorham's and Vanguard Caves represent several aspects of Neanderthal behaviour, some of which are ground-breaking and have no equivalent anywhere else in the world:

- (a) Rock engravings;
- (b) the first and only known example of exploitation of birds for food by the Neanderthals;
- (c) the first and only known example of exploitation of marine, alongside terrestrial, mammals for food by the Neanderthals;
- (d) Neanderthal exploitation of raptors and corvids for their feathers; and
- (e) high resolution evidence.

4. A natural laboratory and archive

Putting together all the available evidence within the candidate World Heritage Site cave archive, it becomes clear that the site represents an exceptional natural laboratory in which to study the close interrelationship between climate, the environment and the Neanderthals in a place where they lived for 100,000 years.

The site is above all else about (a) the well-preserved contents that constitute a veritable archive; and (b) the physical and biological functions that have persisted and create a natural laboratory. At times the landscape would have been similar to today and at others, with sea level drop, quite different. The basic geological structure of the Rock itself, however, would have been very similar to today throughout the period of Neanderthal occupation.

This Gibraltar Neanderthal natural laboratory was created by a combination of tectonic uplift, as the African tectonic plate pushed into the European plate, and climatic-driven (eustatic) sea level change. These fluctuations in sea level, against a backdrop of a rising Rock, kept altering the landscape by exposing and submerging the coastal shelf, by acting on the coastal cliffs and opening up sea caves, by generating mobile dune fields and by encouraging rock falls and landslides which created scree slopes. Coastal processes have been particularly active in the eastern face of the Rock, where there is greater fetch (the length of water over which the wind has blown).

The successive sea-level fluctuations throughout the Quaternary undoubtedly constitute the most important factor determining the morpho-sedimentary evolution of the Rock. There are five main morpho-tectonic steps on the Rock, all within the property: marine terraces between 1 and 25m (e.g. Gorham's Cave), 30–60m, 80–130m, 180–210m (e.g. Martin's Cave), and features above this level. The higher morpho-tectonic steps are older than lower ones, and probably formed in the Pliocene. Raised shorelines are represented by marine sediments and landforms and are best developed to the south and east of the Rock, also within the site. Current evidence suggests that there are traces of at least 12 former levels that are now raised above present mean sea level (MSL) at heights of 1–3, 7–9, 15–17, 20–25, 30–40, 50–60, 80–86, 90–130, 180–190, about 210, and possibly 240–250m or even 300m.



Gibraltar Neanderthals

PLATE Gorham's and Vanguard Caves are the most important caves within the complex.

9



PLATE 10 Putting together all the available evidence within the candidate World Heritage Site cave archive, it becomes clear that the site represents an exceptional natural laboratory.

There are two prevailing winds in the Gibraltar area: easterly and westerly. The former is by far the stronger. Dunes formed by easterly winds were formed on the Rock during the Quaternary, limited to zones which had a sufficient sand supply. In these sectors large, rampant (climbing) type dunes were built against the steep slopes of the Rock, having originated on a marine beach before being blown inland to accumulate as rampant dunes. During the period represented by the Gorham's, Vanguard and other related cave sediments, as well as the Catalan Bay climbing sand dunes, it was likely that Gibraltar was part of the mainland, with a broad coastal plain covered with wind-blown dunes. The Catalan Sands developed between 130,000 and 40,000 years ago, at the same time as the infilling of Vanguard Cave.

The sedimentary record of cave infill includes levels of both external and internal provenance, and accumulations of clastic, chemical and organic debris. Allochthonous (external) sediments are aeolian sands, marine boulders and sands, scree and fissure breccias and rill wash silts and sands. The autochthonous sediments are fallen rocks, water-lain silts and sands, bat guano and bones, human artefacts, combustion zone ash layers, organic and phosphatic sediments, and speleothems. These caves operate like sediment traps that provide a high resolution Quaternary record.

The steep cliffs which fringe Gibraltar were formed by coastal erosion during periods of relative marine sea level high-stand and still-stand. The eastern side of the Rock is exposed to easterly storms from the western Mediterranean (Plate 11). It has a fetch of approximately 1500km. As a result, the eastern side is subject to much stronger littoral erosion, leading to a continuous coastal retreat, while the western side is hardly affected by such a process. Thus the relief of the eastern side, where the site is located, has changed more quickly, giving rise to a great variety of erosional landforms.



PLATE 11 There are two prevailing winds in the Gibraltar area: easterly and westerly. The former is by far the stronger.

4.1 The submerged coastal shelf and coastal oases

For the better part of that last glacial cycle, the sea level remained on average 80m below the present sea level, and at the Last Glacial Maximum fell to –120m. The landscape of Gibraltar was most affected on the east side of the Rock which is much shallower than to the west, and where a large coastal plain was exposed, extending to up to 5km from the present coastline (Figure 3). The emerged coastal shelf harboured many of the biological species, water and lithic raw material resources that were present and were exploited by Neanderthals and modern humans. The plain's substrate was windblown sands which accumulated against the limestone rock. Together, acidic sands and alkaline rocks created a geological ecotone which generated high ecological diversity.

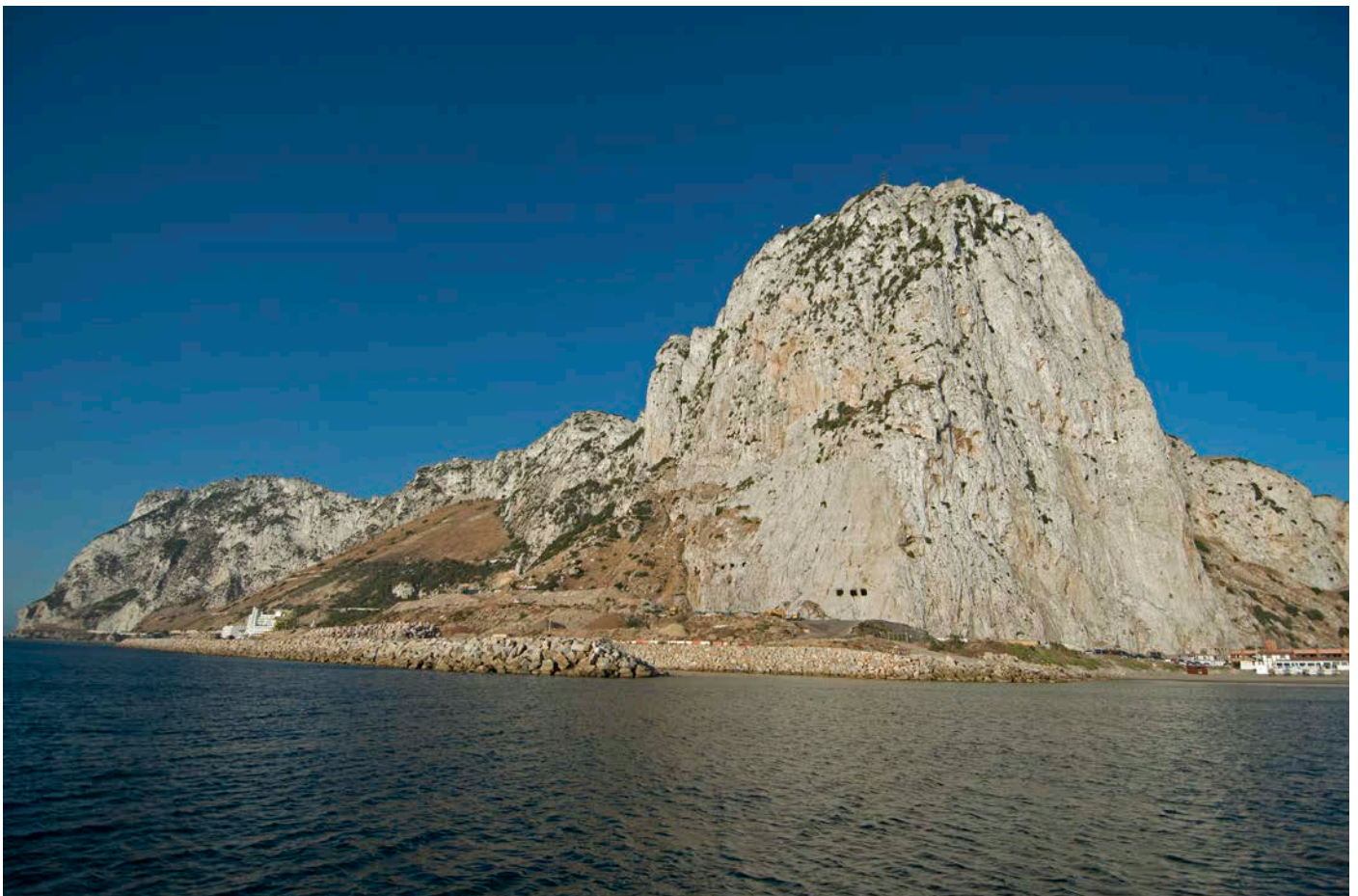
Gibraltar Neanderthals The Gibraltar dolo-limestone formation - the Rock - extends offshore as submerged platforms of various depths (Plate 12). The seabed to the east of the Rock has a shallower gradient than that recorded in the west. It has a gentle slope continuing over 5km from the eastern edge of the Rock in its widest part. The depth of seabed reaches 100-110m before the slope angle doubles. The plateau represents the footprint of what was once a much larger geomorphological feature – one with which Neanderthals would have been familiar.

Several sandstone pinnacles have been identified off the east side of Gibraltar at –30 to –40m. The pinnacles are the tectonic relic of vertical Flysch sandstone strata isolated by differential erosion. These were rock shelters and potential sites of lithic extraction for Neanderthals and are associated with freshwater springs, veritable coastal oases for humans and fauna. Such springs align along the N–S fault contact between the Gibraltar calcareous rocks and the siliceous Flysch Units. During Marine Isotope Stage (MIS) 3 (57-29,000 years ago), in the presently submerged areas, these springs were probably feeding freshwater coastal lakes and ponds, as is detected in Gorham's Cave.

Vladi's Reef is a submerged platform off Europa Point, where archaeological work has been carried out by the project "Underwater Archaeological Excavations (GIBRAMAR)". The reef drops from -19.0m at the top of the cliff to -22.0m at its northeast limit. Here caves are located at the foot of the cliff. The Vladi's Reef breccia has proved to be terrestrial in origin, and its late calccrete cementation have been dated to between 34.84 and 36.28 thousand years ago, providing direct evidence that these reefs at -22m were above sea level at the time of late Neanderthal occupation of Gorham's and Vanguard Caves.

The various Pleistocene cool events that led to lowering of the sea level off Gibraltar opened up a large sandy plain off the east side of the Rock estimated to have been as large as 25km². As easterly winds blew against the Rock sand dunes accumulated. The Catalan Bay Sand Dune on the eastern side buffer zone is part of this process. In addition, there are smaller fossil dunes at various levels, with the highest recorded being 180m above present sea level, by Martin's Cave off the Mediterranean Steps and within the proposed World Heritage Site.

The Catalan Bay Sand Dune deposits are Pleistocene in their entirety and sections have been dated by OSL to between 95,000 and 130,000 years ago. The dune's last active episodes were around 40,000 years ago. The various fossil dunes on the east side of Gibraltar are a unique testimony of aeolian, typically arid, events of the Mediterranean Pleistocene.



Gibraltar Neanderthals

**PLATE
12**

The Gibraltar dolo-limestone formation – the Rock - extends offshore as submerged platforms of various depths. The seabed to the east of the Rock has a shallower gradient than that recorded in the west.

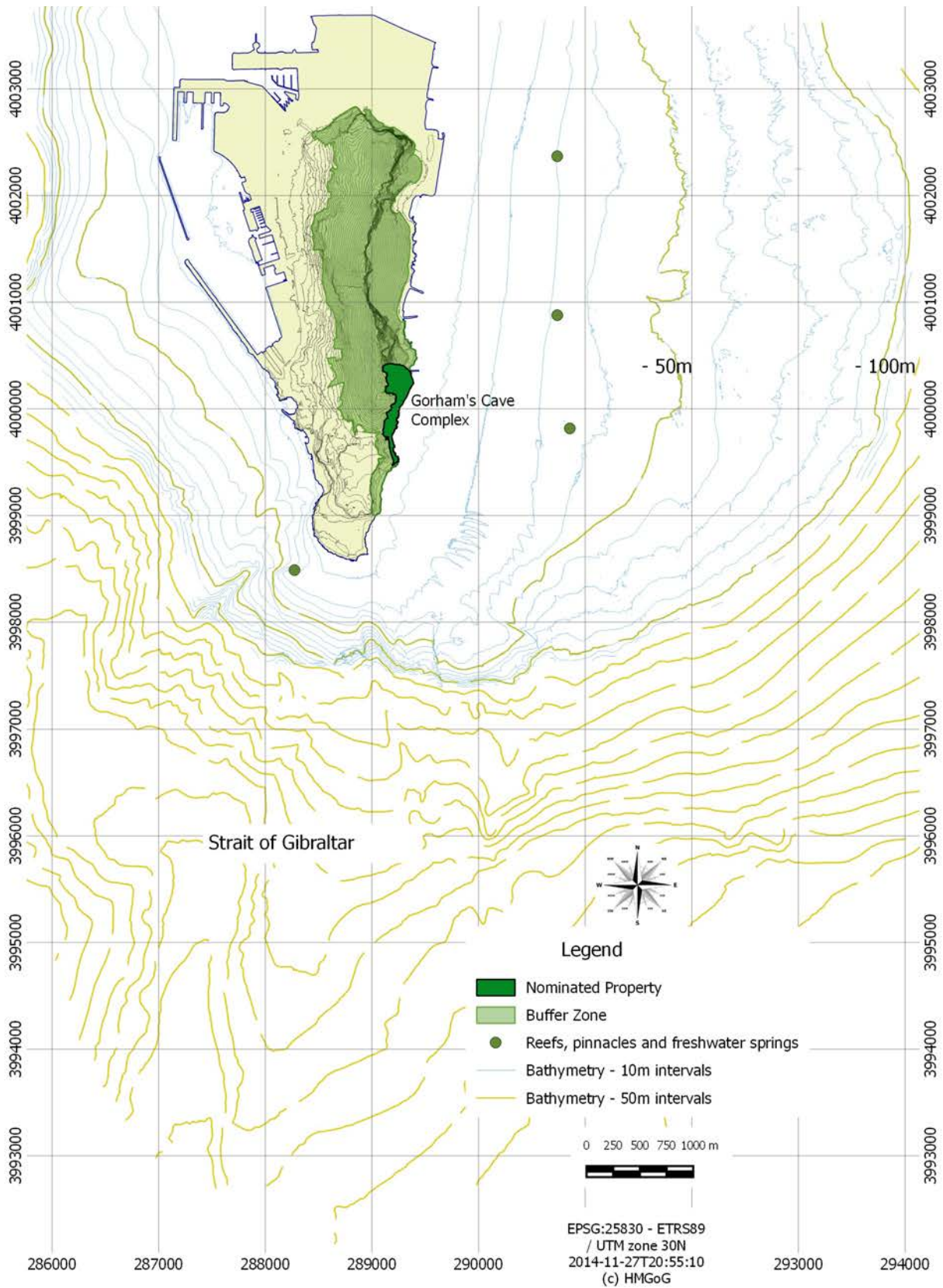


FIGURE 3 Gibraltar bathymetry indicating position of -50m and -100m contours. For the greater part of the time that Gibraltar was occupied by Neanderthals and modern humans the coast was located between these contours, reaching -120m at the last glacial maximum.



PLATE 13 The site encompasses a suite of attributes that express its Outstanding Universal Value (OUV), and meet the conditions of authenticity and integrity.

5. Attributes that give the site its Outstanding Universal Value

5.1 Attributes which carry the property's OUV

World Heritage properties are placed on the World Heritage List because they have Outstanding Universal Value. When a site is placed on the World Heritage List by the UNESCO World Heritage Committee, a Statement of Outstanding Universal Value is adopted. That statement then becomes the baseline for the property's future management. The draft Statement of Outstanding Universal Value for Gibraltar is set out in Appendix 1 of this Management Plan.

The UNESCO World Heritage Convention Operational Guidelines refer to the attributes of a Site that express the Outstanding Universal Value (OUV), and as the means of meeting the conditions of authenticity and integrity:

"When the conditions of authenticity are considered in preparing a nomination for a property, the State Party should first identify all of the applicable significant attributes of authenticity. The statement of authenticity should assess the degree to which authenticity is present in, or expressed by, each of these significant attributes".

These attributes are the qualities which express and carry the Outstanding Universal Value of a World Heritage property. Setting them out these qualities facilitates good management of the property since doing so identifies features which must be protected in order to protect Outstanding Universal Value. Such attributes may be tangible

remains or processes. The list below identifies attributes for which the site is proposed for inscription on the World Heritage List. The protection of these attributes is a key consideration in the management of the Site, particularly in spatial planning, development management decisions and interpretation for current and future generations.

The following attributes express the candidate site's OUV:

(a) Four caves – Gorham's, Vanguard, Bennett's and Hyaena – were occupied by the Neanderthals for 100,000 years. Together, they contain a rich archive of stone tools, remains of camp fires, bones, molluscs and pollen that permit a detailed reconstruction of climate and ecology, as well as Neanderthal behaviour, and changes through time. Gorham's and Vanguard Caves have 18- and 17-metre deep sequences respectively and thus have an extraordinarily high potential for further research. The material from the excavations includes the largest collection of fossil bird species from this period anywhere in the world (150 species). The evidence from these caves is permitting a reappraisal of Neanderthal cognitive capacities and subsistence economy. In addition to having provided the first clear evidence of abstract thinking by the Neanderthals in the form of a rock engraving, they have also demonstrated the active selection by the Neanderthals of birds of prey and crows with black feathers, hinting at previously unsuspected behaviour patterns indicative of symbolism and ornamentation. The research in Gorham's and Vanguard Caves has also revealed, for the first time, the regular exploitation of birds and marine animals for food with clear evidence of processing including cooking. Approximately 70% of the archaeological deposits at Gorham's Cave, 90% of those at Vanguard Cave remain unexcavated. The adjacent Bennett's and Hyaena Caves hold significant potential for future research within the terms of the research framework and are currently left untouched in reserve.

(b) Gorham's Cave also provides evidence of the first modern humans in the area. In addition to stone tools, camp fires and palaeontological material, Gorham's Cave has revealed examples of mobile and parietal art dating back to at least 20,000 years ago. Martin's Cave has parietal art and evidence of early modern humans as do the Goat's Hair Twin Caves.

(c) The 426-metre high Jurassic limestone cliffs within the site provide a unique record of sea-level change, with evidence of fossil beaches at 5m above present sea level, and tectonic uplift, with raised beaches, dunes and scree slopes at different levels up to 210m above present sea level. The cave sequences are therefore embedded in a wider time frame which is recorded by the geological formations within the site, currently estimated at around 3 million years, and encompass the entire Quaternary and part of the Pliocene.

PLATE 14

Pollen and charcoal evidence from Gorham's and Vanguard Caves has shown that many of the plant species growing on the limestone cliffs and ledges today were also present when the Neanderthals lived on the Rock. Photograph shows Honeysuckle *Lonicera implexa*.





PLATE 15

Today, there is a recurring presence of large numbers of birds, many of species recorded as fossil contemporaries of the Neanderthals in the caves, which utilise Gibraltar as a point of transit during their annual migrations between Europe and Africa or as nesting or roosting sites. Photograph shows Blue Rock Thrush *Monticola solitarius*.

(d) Pollen and charcoal evidence from Gorham's and Vanguard Caves has shown that many of the plant species growing on the limestone cliffs and ledges today were also present when the Neanderthals lived on the Rock. The well-preserved vegetation on Mediterranean Steps and adjacent cliffs on the site provides a living testimony of the world of the Neanderthals and the functions of the ecosystems of which they were a part.

(e) Today, there is a recurring presence of large numbers of birds, many of species recorded as fossil contemporaries of the Neanderthals in the caves, which utilise Gibraltar as a point of transit during their annual migrations between Europe and Africa as they would have done at the time of the Neanderthals. There are, additionally, several cliff-nesting resident birds which appear to have lived here since the time of the Neanderthals. Offshore, cetaceans and fish (including tuna), also recorded within the caves as fossils, continue their presence and migrations between the Atlantic Ocean and the Mediterranean Sea. Bats, of species also found in the fossil record, also continue to visit the site today. Put together, a uniquely substantial proportion of the fauna that existed at the time of the Neanderthals remains observable today as are some ecological processes, especially connected with migration.

(f) A well-preserved intertidal community of organisms on the rocky beach by Gorham's and Vanguard Caves with many species which are recorded inside the caves as having been consumed by Neanderthals and early modern humans during the Late Pleistocene.

5.2 Associative attributes

There are attributes which do not form part of the property but which provide contextual information about location, setting, use and function of the site itself. These associative attributes therefore have a direct bearing on and support its outstanding universal value:

(g) Submerged landscape features and a large fossil sand dune – the Catalan Bay Sand Dune – which are relics of the Neanderthal landscape when sea levels were lower than today. The submerged features include Flysch pinnacles at -30m, which are associated with freshwater springs, indicative of the wider landscape at the time of the Neanderthals and of the presence of coastal oases. These features have been modified to some degree by human activity, particularly in relation to the Second World War, but they are of sufficient contextual importance to be considered associative attributes

(h) The rich collections of artefacts and fossils excavated over the past 25 years as well as material from earlier excavations. These collections are housed in the Gibraltar Museum which is situated just 4.5km from the Gorham's Cave Complex.



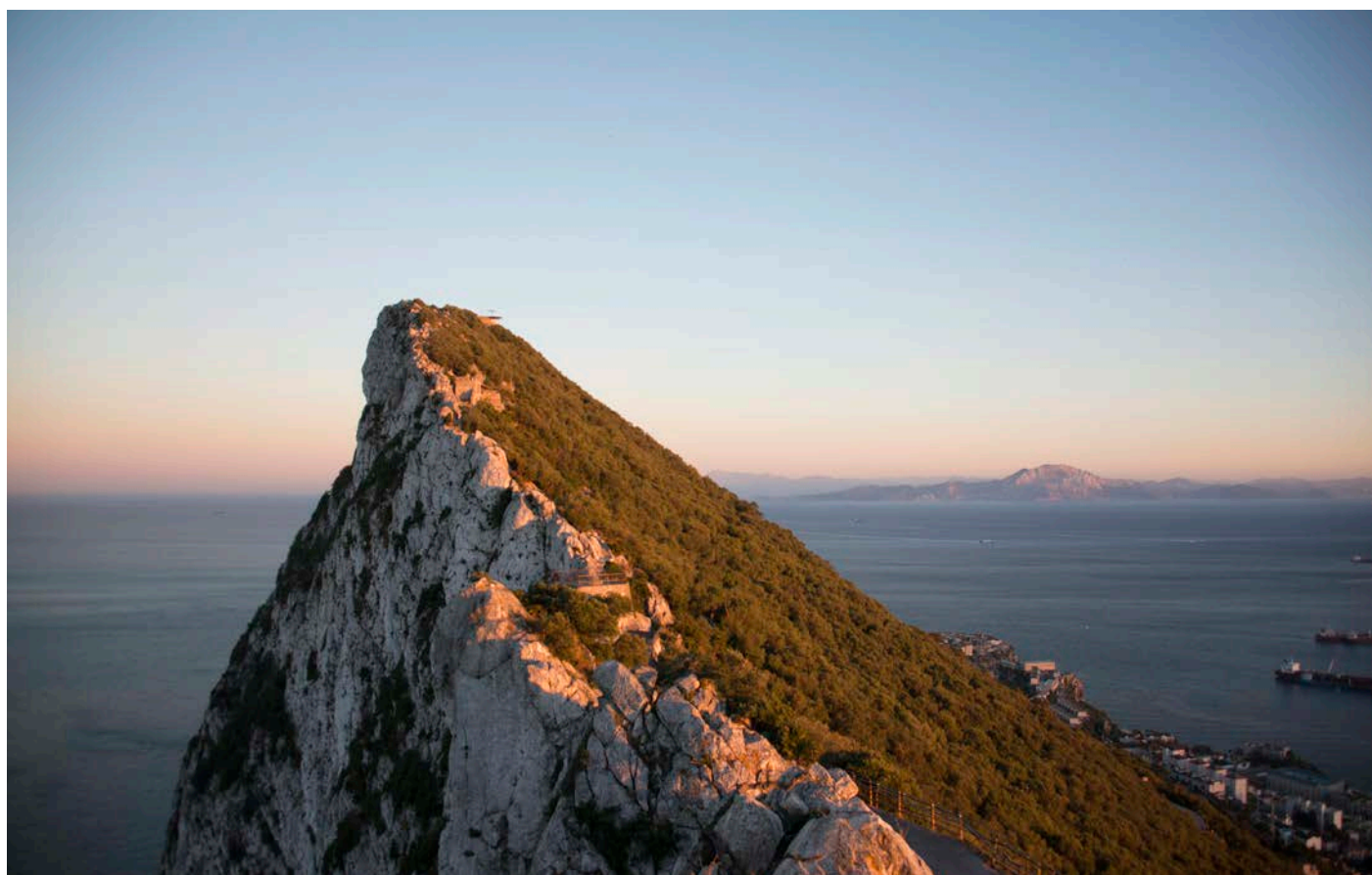
6. Additional values of the site

The candidate World Heritage Site contains a large number of later archaeological and historical remains, as well as natural assets, many of which are important in their own right, although not attributes of its OUV. In some cases these are of international importance. They form part of the management plan for the site.

6.1 Historical and spiritual

The Rock of Gibraltar is a globally recognisable feature. In addition to the specific attributes which give the site its OUV, the broader context is of a natural landmark set within a unique geographic context, astride two continents and two large bodies of water. This image of the Rock as a whole and seen from a distance, either by land, sea or air, constitutes the defining essence of the place and has provided a tangible canvas to the identity of the people who have made this their home.

The spectacular cliffs on the Mediterranean side of the Rock of Gibraltar constituted a famous landmark in the classical world, known as the northern Pillar of Hercules – *Mons Calpe* to the Romans - and signalling the end of the Earth (*ne plus ultra*). At the base of the highest peak, all mariners were required to land and make offerings to the gods in a cave that we know today as Gorham's Cave. The interaction between the ancient eastern Mediterranean mariners and the local indigenous people is recorded in the diverse array of ceramics and other artefacts in Gorham's Cave, spanning the time frame from the 8th to the 3rd Centuries BCE.



Gibraltar Neanderthals

PLATE 17

The spectacular cliffs on the Mediterranean side of the Rock of Gibraltar constituted a famous landmark in the classical world, known as the northern Pillar of Hercules – *Mons Calpe* to the Romans - and signalling the end of the Earth (*ne plus ultra*). The view shows *Mons Abyla* (today called Jebel Musa, Morocco) in the background and *Mons Calpe* in the foreground. The peak falls within the nominated World Heritage Property.

The *Mons Calpe*, the Pillar of Hercules, was a major geographical marker of the ancient world. Beyond this lay the unknown. Reference to its international dimension and symbolic significance is captured widely in the classical literature of outstanding universal significance, commencing with Homer's *Odyssey* (the Pillars of Atlas), as a marker beyond which lay Atlantis (Plato's *Timaeus* and *Critias*), and in various important geographical texts such as Herodotus' *History*, Avienus' *Ora Maritima*, Strabo's *Geography*, Pliny the Elder's *Natural Histories* and Diodorus Siculus' *Bibliotheca historica*. Its origins lie in Greek Mythology, in Herakles' tenth labour – the capture of the cattle of Geryon - during which he created the Pillars.

In the early 8th Century CE, the Rock marked the western edge of the territory of Islam. In 711 the Berber Tarik-ibn-Ziyad led a force across the Strait from North Africa and landed on the Rock. It marked the beginning of the conquest of Hispania and the start of the 781-year Muslim rule of al-Andalus. The spiritual and strategic significance of the cliffs and peaks of the Rock, the beacon and point of the first landing, to Islam were recognised in a new name for the *Mons Calpe*: since then it has been known as the *Jebel Tarik*, the mountain of Tarik - Gibraltar. The symbolic significance of *Jebel Tarik* to Islam is captured in a number of important texts, some of outstanding universal significance: Ibn Battuta's *Travels in Asia and Africa*, al-Idrisi's *Kitab nuzhat al-mushtaq* (Latin *Opus Geographicum*), al-Himyari's *Kita bar-Rawd al-Mi'tar*, Ibn al-Jatib's *Mi'yar al-ljtyar* and Ibn Marzuq's *Musnad*.



**PLATE
18**

Several fortifications are located within the site (Figure 4). They reflect its evolution since the 18th Century. Photo shows the Second Europa Advance Battery in the 19th Century.

6.2 Military heritage

Several fortifications are located within the site (Figure 4). They reflect its evolution since the 18th Century. They include a number of observation posts, gun positions and related structures. Overall, they had little impact on the site. The main ones are:

- (a) Advance Light anti-aircraft (LAA) Site – World War II
- (b) AROW Street Gun Position – World War II
- (c) AROW Street DEL Sites – World War II
- (d) Europa Advance Batteries – 18th Century to World War II. The complex consists of four batteries, three of which (Batteries 1-3) are proposed for conversion into viewing platforms overlooking the Gorham's Cave Complex (Plate 18). The fourth was sited near Monkey's Cave.
- (e) Mediterranean (or Martin's) Battery – 19th Century to World War II
- (f) Sandy Cave DEL Site – World War II
- (g) Scree AASL Site – World War II

6.3 Museum and archival collection

Archaeological and historical collections, other than those referred to above from the site, are housed within the Gibraltar Museum. There is a wealth of documentary material, including paintings, engravings and photographs, housed in the Gibraltar Museum, the Gibraltar National Archive and the Gibraltar Garrison Library.

6.4 Natural

In addition to the natural attributes that give the site its OUV, the candidate property and its buffer zone have a wide range of plant and animal species. Some of these are not part of the OUV but are nevertheless of local, regional and international importance. These include a wide range of plant species, including endemics. Significant re-planting of natural vegetation of the Catalan Bay Sand Dune commenced in 1997 after the metal sheets that formed the water catchments were removed, and is aided by natural seeding.

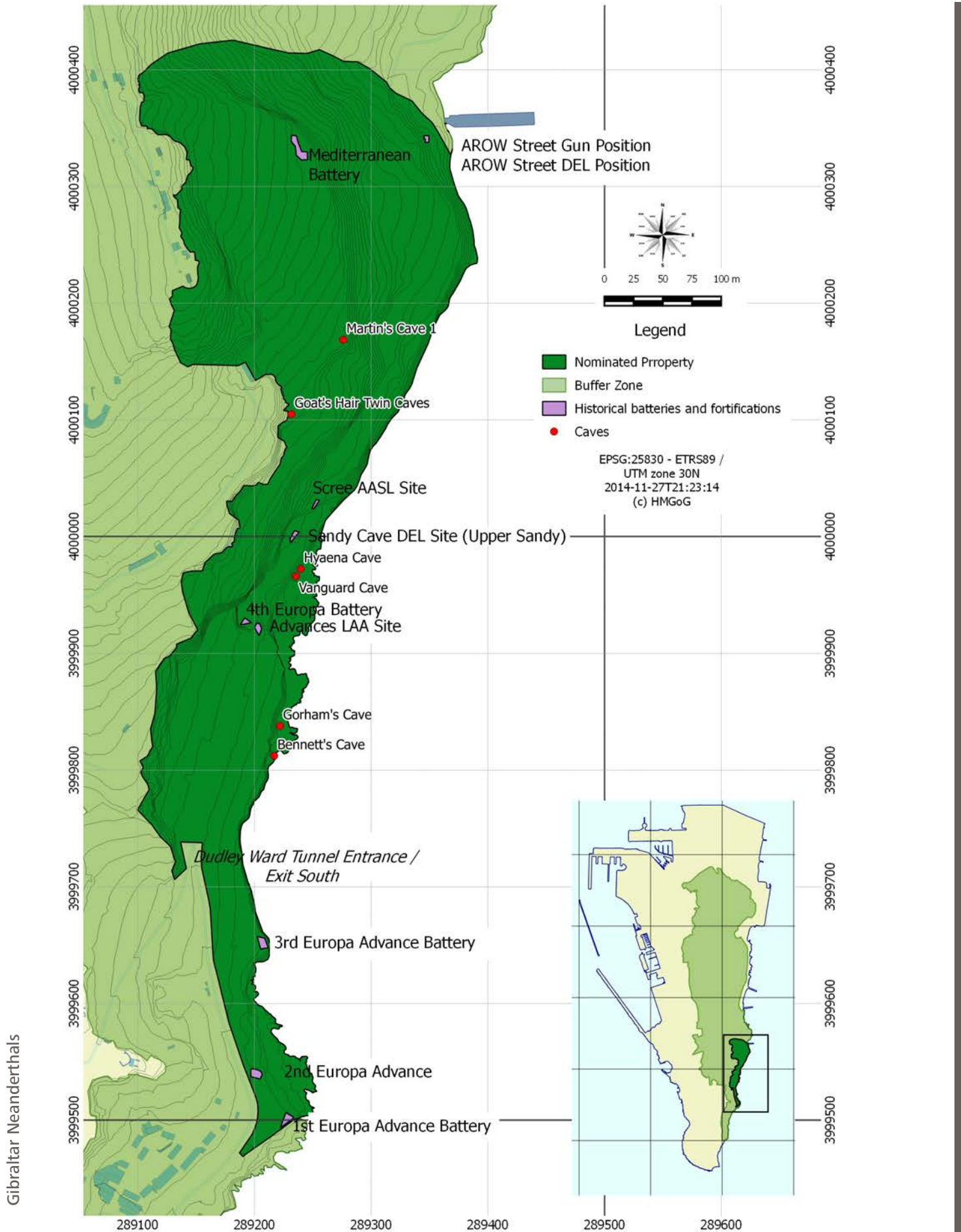


FIGURE 4 Location of historical batteries, other fortifications and tunnels within the candidate World Heritage Site.

6.5 Research

The international, multi-disciplinary, research project that has been excavating in Gorham's and Vanguard Caves over the past 25 years is indicative of the site's research potential. That potential goes beyond the archaeology and palaeontology with scope for significant work in the fields of cultural heritage and natural history including climate change.



PLATE 19 The international, multi-disciplinary, research project that has been excavating in Gorham's and Vanguard Caves over the past 25 years is indicative of the site's research potential. Photo shows excavation at Gorham's Cave.

6.6 Educational

The site provides ample opportunities for locals and visitors of all ages. It is also important for children at primary and secondary levels and has a high potential for undergraduate and post-graduate courses.

6.7 Tourism and economic

The Rock of Gibraltar is the major tourist attraction in the region. Tourism visits mainly focus on the west of the Rock and are largely by coach tour or taxi (Plate 20), with a significant number of visitors on foot. The east side of Gibraltar, incorporating the candidate World Heritage Site, is relatively under-visited despite its potential.



**PLATE
20**

The Rock of Gibraltar is the major tourist attraction in the region. Tourism visits mainly focus on the west of the Rock and are largely by coach tour or taxi, with a significant number of visitors on foot.

7. Why the site is worthy of nomination for World Heritage Status

In order to obtain a place on the World Heritage List, properties must meet at least one of six cultural [or four natural] criteria. In addition the candidate site must meet the conditions of 'integrity' – it is sufficiently complete to contain all attributes which confer OUV; and 'authenticity' – truthfulness and credibility. Candidate sites must also demonstrate that a coherent and fit-for-purpose management system is in place and show how this fits with other planning and management systems. The criteria relate to the qualities set out in the brief synthesis in the Statement of Outstanding Universal Value (Appendix 1).

7.1 Criteria under which the site is proposed

Gibraltar Neanderthal Caves and Environments are put forward under two criteria:

(iii) *“bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared”,* and

(v) *“be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change”*

These proposed criteria underpin the two main qualities of this exceptional site, namely:

(a) its ability to provide a long and detailed, high resolution, record of Neanderthal behaviour and ecology spanning the entire last glacial cycle; and

(b) its diverse and extensive contextual characteristics which uniquely situates the world of the Neanderthals. Together, they uniquely tell the story of the Neanderthals and of the demise of their last populations. To this we may add the comparative value of the behaviour of the first modern humans who arrived at the site and subsisted in the same context as their predecessors had done for 100,000 years. The site complements the Mount Carmel World Heritage Site, the only site currently on the World Heritage List that represents the Neanderthals. Mount Carmel records the first contact between Neanderthals and modern humans between 130,000 and 100,000 years ago, whereas Gibraltar marks the end of the process 100,000 years later.

Criterion (iii): The site provides an exceptional testimony to the Neanderthals, a people and their cultural traditions, who are now extinct. Rock engravings, stone tools, hearths, bones with cut marks and evidence of burning, and molluscs showing fracture marks made with stone tools are the primary evidence of the Neanderthals. A rich array of fossil vertebrates (including the highest avian species diversity of any site), molluscs, pollen and charcoal provide the climatic and ecological context for Neanderthal and subsequent early modern human occupation. The enormous depth of archaeological and palaeontological deposits in Gorham's and Vanguard Caves spans 125,000 years. An outstanding high-resolution record thus allows comparisons across a huge time span and permits analysis of stasis and change in cultural traditions. The quality of resolution allows understanding of the daily activities of the Neanderthals, including their capacities for abstract thinking. The spatial distribution of sites permits a detailed understanding of how the Neanderthals exploited their territory. The present environments of the site contain plants and bird species which shed light on this lifestyle. Our knowledge of the abilities and cultural traditions of the Neanderthals has changed decisively as a direct consequence of the evidence provided by this incomparable site.

Criterion (v): The site is of Outstanding Universal Value because its topography, geological features, natural cliff vegetation and rocky shoreline communities, afford a clear vision of a place which was once home to the Neanderthals. Nowhere is the relationship of the Neanderthals and their environment more palpable than it is in this site. It offers important features that allow us to understand and interpret the traditional lifestyle of the Neanderthals in their environment, and also to compare it to that of early modern humans. Part of this landscape was subjected to irreversible change with sea level rise 10,000 years ago; ancient raised beaches, scree slopes, shorelines and dunes within the site are reminders of the dynamic and precarious nature of a coastal world that was in a constant state of flux. The evidence in the caves enables us to understand how Neanderthals and modern humans adapted to these changes, varying their subsistence strategies as opportunities arose. The incomparable topography of the Rock of Gibraltar, as well as its modern-day flora and fauna, with many species still present from ancient times, opens up an exclusive window into the lost world of the Neanderthals.

7.2 Site integrity

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The boundaries have been chosen to follow natural topographic features that incorporate within them the complete series of attributes that gives the site Outstanding Universal Value. They therefore follow a logical path. The geological and archaeological attributes are exceptionally well-preserved while a significant proportion of the flora and fauna present in the Middle Palaeolithic when the Neanderthals were using the environments is still present today. In addition to their intactness, the attributes have a coherence and hang together well within the boundaries of the property. The inclusion of a significant area surrounding the caves makes it possible to understand more fully the ways in which the Neanderthals interacted with their surroundings. It also ensures that the nominated property is of adequate size to ensure the complete representation of the features and processes that convey its significance.

Major risks affecting the property are largely related to long-term climate change and sea level rise, with shorter term risks associated with natural fires and rock falls. These latter risks are currently considered to be low and are closely monitored. Potential human-induced sea level rise, and the consequent impact of wave erosion on cave deposits, is not considered an immediate risk but coastal protection in the medium term is under consideration and is incorporated into the site's action plan. Having parts of the site on the coast also means that, as in any other coastal site, the risk of an oil spill from a passing ship cannot be fully discarded. None have occurred to date. Established contingency plans have been historically in place for such emergencies as summer fires and oil spills.

The attributes are not threatened by development, deterioration or neglect. A combination of legal protection, active management, massive vertical scale and abrupt topography minimise risks to the property, which can only be appreciated if its dynamic character is fully understood.

There are potential risks today, to a property close to a high population density, which derive largely from access-related problems (e.g. vandalism, collection of rocky shore molluscs). The nature of the site acts as a buffer in its own right. Access is monitored and the most sensitive parts of the site have restricted access.

The Management Plan includes strategies for managing risk and a full risk-preparedness plan with a risk register (Appendix 2).

7.3 Site authenticity

The authenticity of the site is guaranteed by its existing attributes, listed above in section 5.1, which convey the site's meaning. These attributes fall into three distinct categories:

- 1) The stratified deposits within the caves which contain a wealth of information that situates the site in a temporal framework are wholly authentic in material and substance. Within the deposits are artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first modern humans. A Neanderthal rock engraving is situated in the inner chamber of Gorham's Cave and parietal art from the Solutrean culture is found in the main and inner chambers of Gorham's Cave and also in Martin's Cave;
- 2) the form and substance, as well as the location and setting of the caves themselves and the surrounding cliffs, their geological formations and the tangible evidence of climate and sea level change in the form of ancient beach levels; and
- 3) The well-preserved relict cliff vegetation and specific faunal elements that have a direct connection with the vegetation and fauna of these cliffs when Neanderthals and modern humans lived in the caves.

The attributes convey the site's meaning at two different levels:

- (a) The whole property and how it conveys value through an overarching authenticity; and
- (b) The individual attributes that convey specific information about particular aspects of the site.

The authenticity of the information derived, forming the basis of site's meaning, is guaranteed by the extent to which the archaeological deposits survive intact as well as through an extensive list of publications in the international, peer-reviewed, literature. This information also serves to document and understand the continuing functions (vegetation dynamics, geological erosion and sea level interplay, bird migration systems) of the site and its former use by Neanderthals and the first modern humans to reach the area. Importantly and exceptionally, the information obtained is opening a window into the traditions of the Neanderthals and crucially, via the long temporal sequences

available, is providing a detailed documentation of changing traditions (e.g. in stone tool technology and in resource exploitation) over time.

The authenticity of location and setting of the property, through its attributes, allow for a clear understanding of a place which had been occupied by people – Neanderthals and modern humans – for millennia. Though more difficult to demonstrate, the impressive topography and setting, is highly suggestive of a location that would have had spiritual meaning to the earliest inhabitants, just as it did to later generations (e.g. Phoenicians and Carthaginians) who recorded that sense and even used the site to make offerings to the gods.

8. Current state of the property

The overall condition of the property is excellent and this is particularly noteworthy given its proximity to a high population density zone and the long military history of the Rock of Gibraltar. A series of positive actions was being undertaken in the buffer zone, irrespective of nomination and as part of a drive to improve the quality of the experience for people visiting the area along with supporting the emphasis which Gibraltar is placing on its heritage and environment. Thus, a major programme of improvements to areas of the Gibraltar Nature Reserve is part of a process that was happening independently of nomination. With the run up to nomination, these projects are being done in co-ordination with the World Heritage project. The measures currently in hand are aimed at further improvement through landscaping and removal of some disused buildings which are in the buffer zone.



Gibraltar Neanderthals

**PLATE
21**

The general state of conservation of the property is excellent. Photo shows Martin's Cave half-way up the Rock amidst the lush vegetation of Mediterranean Steps.

8.1 The nominated World Heritage property

The general state of conservation of the property is excellent. Specifically, the property's attributes, which give it its OUV, are in excellent condition and maintain a natural coherence. The caves, a major component, are well-preserved and the main archaeological and palaeontological ones retain vast deposits that constitute a reservoir of information for present and future generations of scientists. The scale of the deposits is such that little impact is noticeable from the last 25 years of excavation – in excess of 97% of deposits remain. The cliffs are in pristine condition and covered in rich growths of lichen which are indicators of clean air. The lush natural vegetation on these cliffs, which can be experienced at first hand in the Mediterranean Steps, is an excellent indicator of the environmental health of the property. Despite the high density of population in Gibraltar, the remoteness of the vertical cliffs has guaranteed their long-term survival, which is now enhanced by legal protection. This isolation has also allowed species of birds to live here, either to nest, roost or to refuel on migration.

The condition of individual heritage assets is therefore very good with those relevant to the site's OUV being excellent. These include the caves with Middle Palaeolithic occupation at sea level and higher up the Rock.

Archaeological deposits are in very good condition but the fragile remains need continuing protection by restricting access and carrying out further investigation under strict conditions (Volume 4). Excavations have followed a research strategy based on specific questions being asked of the site. The Gibraltar Museum has a statutory advisory role under the Gibraltar Heritage Trust Act and maintains a close vigilance on the state of conservation of the site and the impact of excavations. Land access to some of the most sensitive caves is already restricted by the Gibraltar Museum to 20 people escorted at any one time and only with permission from the Director of the Gibraltar Museum. Such access is controlled by the Ministry of Defence. This system of controlled access will continue.



Gibraltar Neanderthals

PLATE 22

Archaeological deposits are in very good condition but the fragile remains need continuing protection by restricting access and carrying out further investigation under strict conditions.

Some caves that are accessible have been protected by gates and monitoring of others by the Gibraltar Museum's Caving Unit is on-going. There are some relatively minor problems in a few caves (particularly Goat's Hair Twin Caves) with graffiti but there is a programme in place to remove these. Some of the historic graffiti will be left, as they form an important part of the site's history and are of significant local interest. There is also a regular programme of routine cleaning and litter removal. All accumulations of recent debris washed ashore were removed in July 2014.

Several elements within the property, none of them critical attributes of OUV, require attention and are being addressed (see section 21, Works Plan). Safety considerations require the renovation of the steps leading down to Gorham's and Vanguard Caves, but this work will be low key and in keeping with the existing design. It is programmed for completion in early 2015. The Second World War Monkey's Cave Convalescent Hospital, above Gorham's Cave, is in an unusable condition (Plate 23). In relation to the site's OUV the hospital is of very low significance. Its façade will be repaired and painted in December 2014 but the building will remain out-of-bounds. Routine cliff stabilisation maintenance (such as replacement of netting) will be carried out as needed, forming part of a regular programme of assessment. One small area of cliff above Gorham's Cave requires the addition of a 2-metre high rock fall safety fence along the cliff top and the work is scheduled for early 2015. The fence will be screened by allowing the re-growth of native vegetation. Heritage Impact Assessments are routinely carried out before works are executed.

The Europa Advance Batteries sit within the candidate site and will become viewing platforms with information boards. They overlook the main caves and will provide visitors with spectacular views. To achieve these viewing platforms, and incorporate their historical value, portacabins and other structures currently on the batteries will be removed. The viewing platforms will be integrated into the programme of Gibraltar Nature Reserve walkways currently in advanced stage of execution. A programme of works will ensure regular maintenance.

The condition of the Mediterranean Steps and the high cliffs is excellent (Plate 24). Routine maintenance of paths, steps and safety features is carried out. There is an on-going maintenance programme undertaken by the Ministry of the Environment in consultation with the Gibraltar Ornithological and Natural History Society. Baseline data on plant species, birds, mammals and reptiles are kept and monitored by the Gibraltar Ornithological and Natural History Society, through Wildlife Gibraltar Ltd.

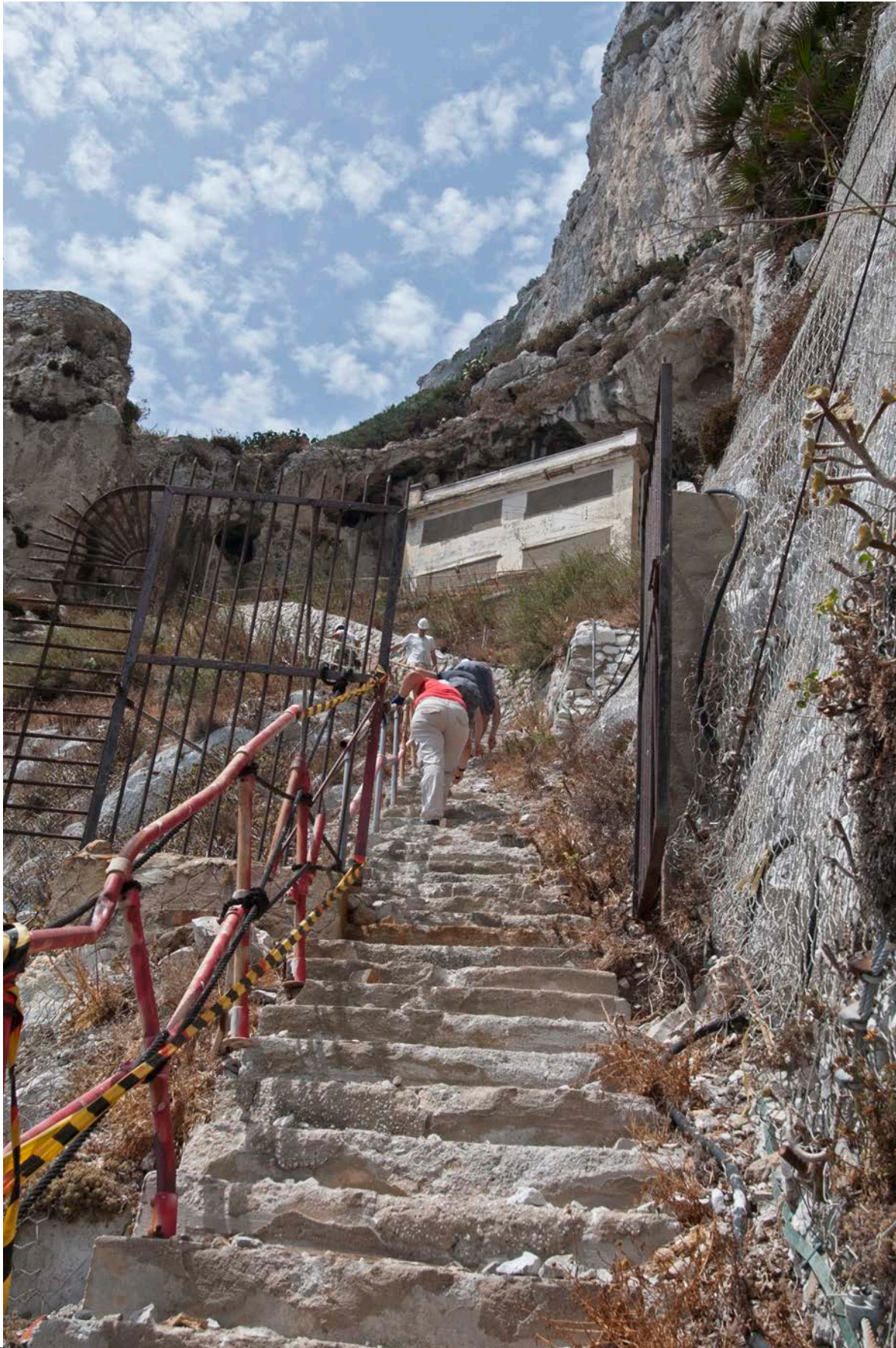


PLATE 23

Several elements within the property, none of them critical attributes of OUV, require attention and are being addressed. The renovation of the steps leading down to Gorham's and Vanguard Caves will be low key and in keeping with the existing design. It is programmed for completion in early 2015. The Second World War Monkey's Cave Convalescent Hospital (top of image) is in an unusable condition. Its façade will be repaired and painted in December 2014.

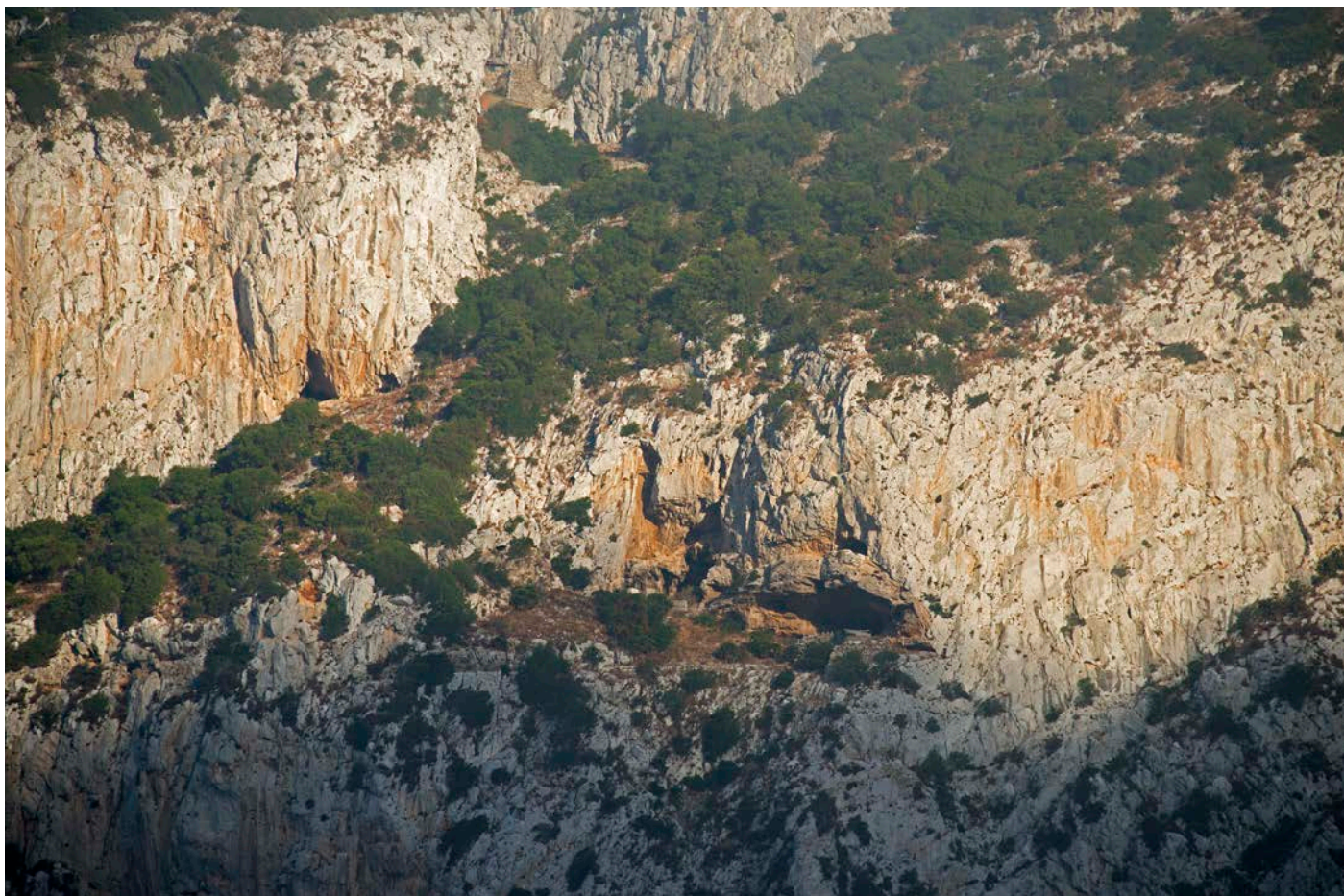


PLATE 24 The condition of the Mediterranean Steps and the high cliffs is excellent. Photo shows panoramic of Mediterranean Steps and vegetation, showing Martin's Cave (lower centre) and Goat's Hair Twin Caves (centre left).

8.2 State of conservation of the nominated property's buffer zone

The aim of the buffer zone is the protection from adverse external impact on the attributes within the property. It will achieve this as a strictly controlled zone which permits the continued protection of vegetation and fauna, acting as a reservoir of species to the property.

Most of the buffer zone is free from development pressure as part of the Gibraltar Nature Reserve, thus protecting the property's setting. The few areas of buffer zone outside the reserve are also regulated by Town Planning procedures. As such, the buffer zone today fully protects these attributes of OUV. Nevertheless, work is in hand to improve and beautify the approaches to the site through landscaping and the removal of unused buildings and structures. The part of the buffer zone on the western side of the Upper Rock (west of the ridgeline marking the top of the nominated property) is entirely within the designated Gibraltar Nature Reserve and its overall condition is very good. The Nature Reserve is protected by legislation and by the Gibraltar Development Plan; access is controlled and restricted between sunset and sunrise. This part of the reserve (the Upper Rock) contains several natural and heritage visitor attractions and carries the majority of visitor traffic. There are daily programmes of cleaning and routine maintenance which cater for littering caused by some visitors to the area. Visitor facilities are also in the process of being upgraded with a £3 million programme of improvements to access having been announced in July 2014.



PLATE 25 The Gibraltar Nature Reserve has evolved and developed significantly since the original Nature Reserve was designated in 1993 which was exclusively contained within the extent of the Upper Rock.

The Gibraltar Nature Reserve has evolved and developed significantly since the original Nature Reserve was designated in 1993 when it was exclusively contained within the extent of the Upper Rock. As part of the continued effort to further protect biodiversity and natural habitats in Gibraltar, the Upper Rock Nature Reserve was extended in 2013 to include new areas that will help protect unique and distinctive habitats and species found in Gibraltar. Legal protection is provided by means of the Nature Conservation (Designation of Gibraltar Nature Reserve) Order 2013 and the Nature Protection Act 1991. The Gibraltar Nature Reserve now encompasses distinct habitats all of which support both endemic and more common flora and fauna. In order to ensure the proper management of the reserve, a new management plan is being published in 2015 by the Department of the Environment which builds on the existing plans namely the *Upper Rock Nature Reserve: A Management and Action Plan* produced by Perez and Bensusan (2005) and the *Gibraltar Biodiversity Action Plan: Planning for Nature* (Perez, 2007). The revised plan, which will cross refer with the candidate World Heritage Site Management Plan, sees the creation of a wider management body composed of the Ministry for the Environment, Ministry for Tourism, Ministry for Heritage, Nature Conservancy Council, Department of the Environment, Gibraltar Tourist Board, Gibraltar Ornithological and Natural History Society, Gibraltar Museum, Heritage Trust and the Ministry of Defence as well as a number of *ad hoc* stakeholders. This structure will complement the management structure for the candidate World Heritage Site.

There is nothing in the southern strip of the buffer zone, south of the Gorham's Cave Complex, which has a direct impact, other than visual, on the site and action is in hand to beautify this area. A disused waste incinerator facility is located within this zone and its high chimney, in particular, is an eyesore which detracts from certain views of the site. The dismantling of this incinerator commenced in July 2014 and a long-standing eyesore is being removed (section 21, action 1/011). Other visual intrusions are relatively minor in comparison.



PLATE 26 A disused waste incinerator facility is located within this zone and its high chimney, in particular, is an eyesore which detracts from certain views of the site. The dismantling of this incinerator commenced in July 2014 and a long-standing eyesore is being removed.

An adjacent abandoned quarry is currently used to store refuse. This facility has no visual or other impact on the nominated property. Netting and screening has been placed, as an interim measure, to contain the refuse. With the rationalising of facilities in this area, related to the removal of the incinerator, this deposit will be closed down and the quarry used for parking coaches and other vehicles for visitors to the viewing platforms. Recent and historical accumulations of litter on some cliff taluses are in the process of removal.

Vegetation landscaping, using native species, is seen as the key to improving the quality of the buffer zone. A programme of planting will commence in 2015 and will be on-going. It will focus on the removal of invasive species and the planting of natural vegetation, including stone pines and junipers, which are known to have grown naturally since the time of the Neanderthals.

The buffer zone along the east coast comprises the Catalan Bay Sand Dune (Plate 27), the cliffs above the dune as well as talus slopes within the Gibraltar Nature Reserve at its north-eastern corner. The state of conservation is very good and the strict guidelines of the Gibraltar Nature Reserve apply. There is remnant machinery on a small area of the slopes of the Catalan Bay Sand Dune and a programme of removal is in the works plan for the buffer zone (section 21).

Tamarisks have recently been planted to line the northern entrance to the Dudley Ward Tunnel. Further planting of native vegetation will screen the entrance, particularly as the trees grow in stature.



**PLATE
27**

The buffer zone along the east coast comprises the Catalan Bay Sand Dune, the cliffs above the dune as well as talus slopes within the Gibraltar Nature Reserve at its north-eastern corner. The state of conservation is very good and the strict guidelines of the Gibraltar Nature Reserve apply.

8.3 The wider setting

The wider terrestrial setting is framed by the iconic outline of the Rock. There are historical and modern buildings, notably military remains and the village of Catalan Bay and Both Worlds which take advantage of the limited amount of ground suitable for settlement on the east side. None of the settlements impinge directly on the candidate site and protection is through the planning system, which is being amended to take account of the candidate site (Appendix 3). The military emplacements in and on the Rock form a key part of its history and development, but do not detract from key vistas of the candidate world heritage site particularly from the south east where the complete sequence of tectonic units and caves can be viewed.

The marine setting is very good and protected by designation as a Special Area of Conservation (Southern Waters of Gibraltar SAC) and anchorage restrictions monitored by the Port Authority. The best way to appreciate the whole site is from the sea and this is taken into account in the visitation strategy. Viewed from the sea, the site and its evolutionary history is perfectly clear as it retains its natural coherence within which the various attributes are seen to be interlinked and their interrelationship is clearly visible. There is a programme of regular clearance of litter on some sea cliffs in place.



**PLATE
28**

There are historical and modern buildings, notably military remains and the village of Catalan Bay (seen here) and Both Worlds which take advantage of the limited amount of ground suitable for settlement on the east side. None of the settlements impinge directly on the candidate site and protection is through the planning system.



**PLATE
29**

Viewed from the sea, the site and its evolutionary history is perfectly clear as it retains its natural coherence within which the various attributes are seen to be interlinked and their interrelationship is clearly visible.

9. Vulnerabilities and threats

The risk register (Risk Preparedness Plan and Register in Appendix 2) identifies the main issues potentially affecting the site and its attributes of OUV, their potential severity and scale of impact. This section summarises key vulnerabilities either human- or naturally-induced and sets out the general approaches to mitigating potential impacts. There will be a full programme of active monitoring to ensure the conservation of key features and the whole property.

9.1 Human-induced vulnerabilities: development pressures, access, archaeological works and vandalism

9.1.1 Within the nominated World Heritage property

There are no pressures for re-building or new construction within the property boundaries. There are no pressures from adaptation of existing buildings for new uses or from tourism-related development which would affect the OUV, authenticity or integrity of the site.



Gibraltar Neanderthals

**PLATE
30**

There are some relatively minor problems in a few caves (particularly Goat's Hair Twin Caves) with vandalism and graffiti but there is a programme in place to remove these.

Littering is a constant minor threat to all areas of the site and the wider context. There is a regular programme of routine cleaning and litter removal within the site. All historical accumulations of debris washed ashore by Gorham's and Vanguard Caves were removed in July 2014.

There are some relatively minor problems in a few caves (particularly Goat's Hair Twin Caves) with vandalism and graffiti but there is a programme in place to remove these (section 21, action 1/022). Some of the historic graffiti will be left, as they form an important part of the site's history and are of significant local interest. Martin's Cave is protected by a secure gate.

There is no public access to the Gorham's Cave Complex sea caves by land, which helps in protecting the sensitive cave deposits. Access is through Ministry of Defence and HMGoG land and is restricted to a maximum of 20 people at any one time, and requires the permission of the Director of the Gibraltar Museum. Future access for excavations or visits will be principally by boat. Additional security measures to protect specific features in caves have been implemented, and will be strengthened using remote camera surveillance and other measures if necessary.

The Mediterranean Steps and Upper Rock are accessible by foot and are well-used by local people and by visitors to Gibraltar. Tourism management is light and low-key: the area is maintained with interpretation panels, and there are routine safety checks and maintenance works. The vegetation along the cliff walk is not threatened. Non-governmental organisations – Gibraltar Ornithological and Natural History Society and Gibraltar Heritage Trust, which have interests in the site – are directly involved in the management and consultation process. Public awareness-raising and education are considered essential tools in minimizing encroachment pressure. The general public is kept informed of work undertaken, including progress of annual excavations. In addition, stakeholders form part of a Steering Committee during the process of nomination of the site for World Heritage Status. Their role will be extended post-nomination within the World Heritage Advisory Forum (section 20 below).

Archaeological excavations, though naturally removing sediments, are hugely significant in enhancing knowledge and interpretation. The excavations are carefully managed to ensure there is no loss of site integrity. Excavations will be subject to a licence from the Minister for Heritage under the Heritage Trust Act and will be supervised and monitored by the Gibraltar Museum and the International Research and Conservation Committee (IRCC). Works will be carried out under the guidance of an over-arching Research and Conservation Strategy (Volume 4). The IRCC will also assess annual excavation plans from the perspective of conservation and maintenance of site integrity, taking particular note to the expected volume of sediment to be excavated in relation to potential impact on the sites' potential for future research and conservation.

9.1.2 The buffer zone

Most of the buffer zone is part of the Gibraltar Nature Reserve and is subject to its strict protective measures. There will, from time to time, be a need to maintain or replace existing infrastructure in the Gibraltar Nature Reserve. This infrastructure is mainly of historical military origin and cannot realistically be moved or buried; it is part of the heritage of the Rock. Any maintenance or replacement will, however, take account of the importance of the site and will be carefully monitored by the World Heritage Team. Potential development pressure within the buffer zone is restricted to the east side along Sir Herbert Miles Road. This area currently falls within Zone 4 of the 2009 Gibraltar Development Plan (Figure 7) which sets general standards including environmental improvement and protection of natural and cultural heritage assets (see also Appendix 3). Within the buffer zone, at the southern end, the existing waste incinerator on Europa Advance Road is being dismantled, improving vastly the condition of that sector of the buffer zone. There is limited scope for development along Sir Herbert Miles Road due to space and the risk of rock falls from the cliffs above (Appendix 3).

The Catalan Bay Sand Dune has historically been used as both catchments for water collection and, to a very small



PLATE 31

Archaeological excavations, though naturally removing sediments, are hugely significant in enhancing knowledge and interpretation. The excavations are carefully managed to ensure there is no loss of site integrity.

extent, as a source of building material. There are no threats, however, as the land is now included in the Gibraltar Nature Reserve and is protected by legislation. It is anticipated that a small strip of sand dune which is not part of the Gibraltar Nature Reserve will be included and given full protection in early 2015. The dune is potentially accessible from certain points but its form and the steepness of slope mean that there are no threats of unmanaged visitors and the main access points are controlled by locked gates. Routine surveys and maintenance are undertaken to ensure stability

9.2 Environmental pressures and natural disasters

The potential sources of environmental deterioration are climate change, sea level rise and pollution from ships. Climate change and sea-level change have been features of the history of the area which lead to its OUV but it is not likely to have an impact on the vegetation or wildlife in the foreseeable future. The principal risk from sea level rise is to the sea caves with Middle Palaeolithic, Neanderthal occupation deposits (Appendix 2). This is not considered an immediate concern, but risk of erosion is a medium-term pressure and protection by some form of marine structure will be investigated as part of the management plan implementation. Any measure will be referred to the World Heritage Advisory Forum, the Development and Planning Commission and will take due regard of the requirements of the World Heritage Site and the marine Special Area of Conservation (SAC).

Potential threats to the property are rock falls, cliff erosion, sea incursion, fire and drought (Appendix 2). These are currently considered to be low risk and risk preparedness plans are in place to cover all these aspects. There is a regular programme of risk assessment on the stability of the Rock and its cliffs, contingency plans for fire and accidents, floods and other disasters. At present there is no pollution from vessels off the coasts of Gibraltar. Potentially, pollution - such as oil pollution - from ships passing by or anchored off the east coast could have a very detrimental effect on the marine environment. The marine setting is protected as a Special Area of Conservation. The present assessment of risk is very low, and there is a programme of monitoring and reporting of all incidents through the Captain of the Port. Results are published annually in the Government's Abstracts of Statistics. Risk preparedness plans are in place to cover all these aspects.



Gibraltar Neanderthals

**PLATE
32**

Potential threats to the property are rock falls, cliff erosion, sea incursion, fire and drought. These are currently considered to be low risk and risk preparedness plans are in place to cover all these aspects.

10. Policy objectives for the plan period

In order to maximise the site's potential and that of its attributes, taking full consideration of the need for protection, the management of the Gibraltar Neanderthal Caves and Environments site requires a long-term view. This view is guided by the following policy objectives:

- (1) To safeguard the site's Outstanding Universal Value;
- (2) To foster the gathering and dissemination of scientific information about the site;
- (3) To promote awareness and understanding of the site's Outstanding Universal Value;
- (4) To welcome local people and visitors to the site at levels which it can sustain;
- (5) To provide a high quality range of educational information and services about the site;
- (6) To ensure that World Heritage Site status assists wider sustainable development objectives within Gibraltar;
- (7) To promote and support the aspirations of UNESCO in sustainable development, inter-cultural dialogue and the relief of poverty; and
- (8) To be an exemplary model for World Heritage Site Management.

These objectives flow through the proposed approaches, work plans, monitoring and management systems and will be reviewed and reported annually. The responsibility for ensuring the implementation of the policy objectives rests ultimately with the World Heritage Site Director, assisted by a dedicated team each with specific roles. The project is overseen by a steering body – currently the WH Site Steering Group but from 2016 (if the bid is successful) the Advisory Forum, chaired by the Deputy Chief Minister and with representatives of all key departments and the community. Representatives of the UK Government are also invitees to the Forum, as the State Party to UNESCO.

The key phrase used constantly is Outstanding Universal Value: something of such importance that it transcends boundaries and is has global meaning and significance. Gibraltar Neanderthal Caves and Environments are clearly of major significance in understanding the global story of human evolution and adaptation. Gibraltar provides a unique opportunity for people to experience the environments that were present 100,000 years ago and to appreciate the nature, abilities and lifestyle of the Neanderthals.

But OUV only has meaning if it is embedded in the local ecology and is in harmony with local communities (Irina Bokova, Director-General of UNESCO, 2011), and has perceived and real benefits. It is therefore essential that the project is understood and supported by the Gibraltar community.

The nomination provides a range of opportunities for Gibraltar and Gibraltarians, and this Management Plan seeks to set down ways of taking some of those opportunities, irrespective of whether the site is inscribed on the World Heritage List. These opportunities include:

- Economic improvement, including job creation through tourism and heritage management
- Building local skills and capacity
- Education opportunities - improved physical and intellectual access to cultural and natural heritage for community – for all ages and all abilities
- Social, community engagement and pride
- International profile – remote access - media centre of excellence for heritage studies and practice – capacity building – economic and reputational impacts

But the nomination also brings challenges. Amongst these will be ensuring public benefit from investment in cultural heritage, ensuring a fully-integrated sustainable approach to heritage management, planning and tourism, viewing cultural heritage as a source of pride and a driver of change rather than a barrier to change, infrastructure and transport needs, resources and skills availability and not least funding in an increasingly-pressured economic environment.

None of these are insurmountable, and in a compact territory with good communication may well be more easily overcome than in many places. But they will need effort and investment to ensure that the benefits are clear to all. Good communication and working in partnership are essential.

The following pages outline the approaches to achieving the policy objectives, detailed actions are set out with target dates in the Works Plan (section 21). A set of indicators for monitoring the effectiveness of the policies and strategies is set out in section 22.

11. Safeguarding the site and its values

11.1 Ownership

Ownership of the site rests with Her Majesty's Government of Gibraltar who has appointed the Gibraltar Museum, through its Director, as managers. Small sections of the site are under the ownership of the Ministry of Defence. All the key attributes of Outstanding Universal Value are entirely situated within wholly owned HMGoG (non-leased out) land (Figure 5).

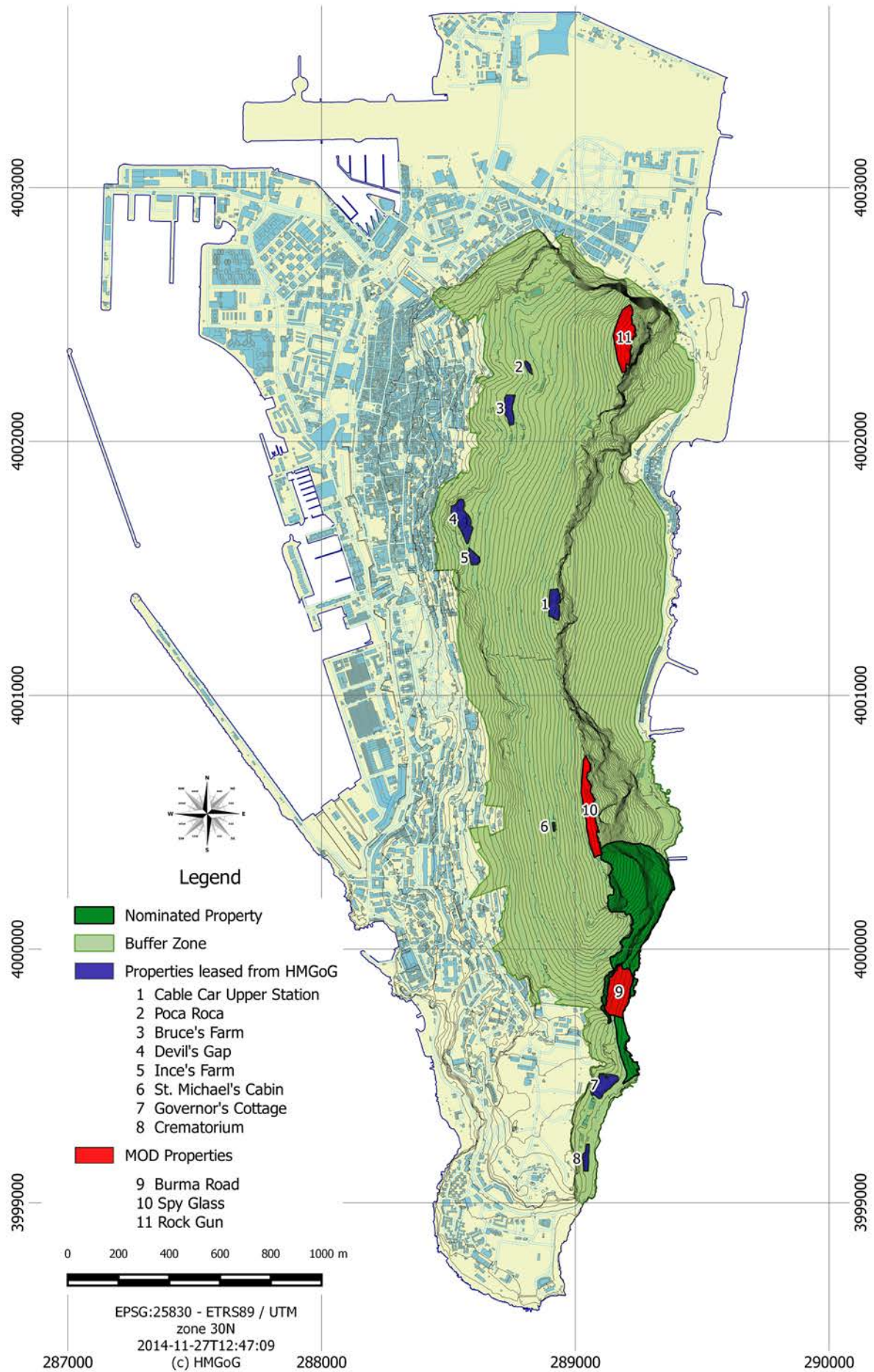


FIGURE 5 Landownership map.

11.2 Legal protection and community involvement

Gibraltar has a long tradition of heritage protection which was first formalised in 1930 with the Museum and Antiquities Ordinance. The present Gibraltar Heritage Trust Act is the direct descendant of this early statute. Nature protection legislation dates to the Nature Protection Act, 1991, although there were earlier statutes protecting wild birds, etc. The Nature Protection Act prescribes the constitution of a Nature Conservancy Council and allows for the creation of protected spaces. The Gibraltar Nature Reserve, which includes the property and a large area of buffer zone, is designated under this Act (Figure 6).

Gibraltar Neanderthals

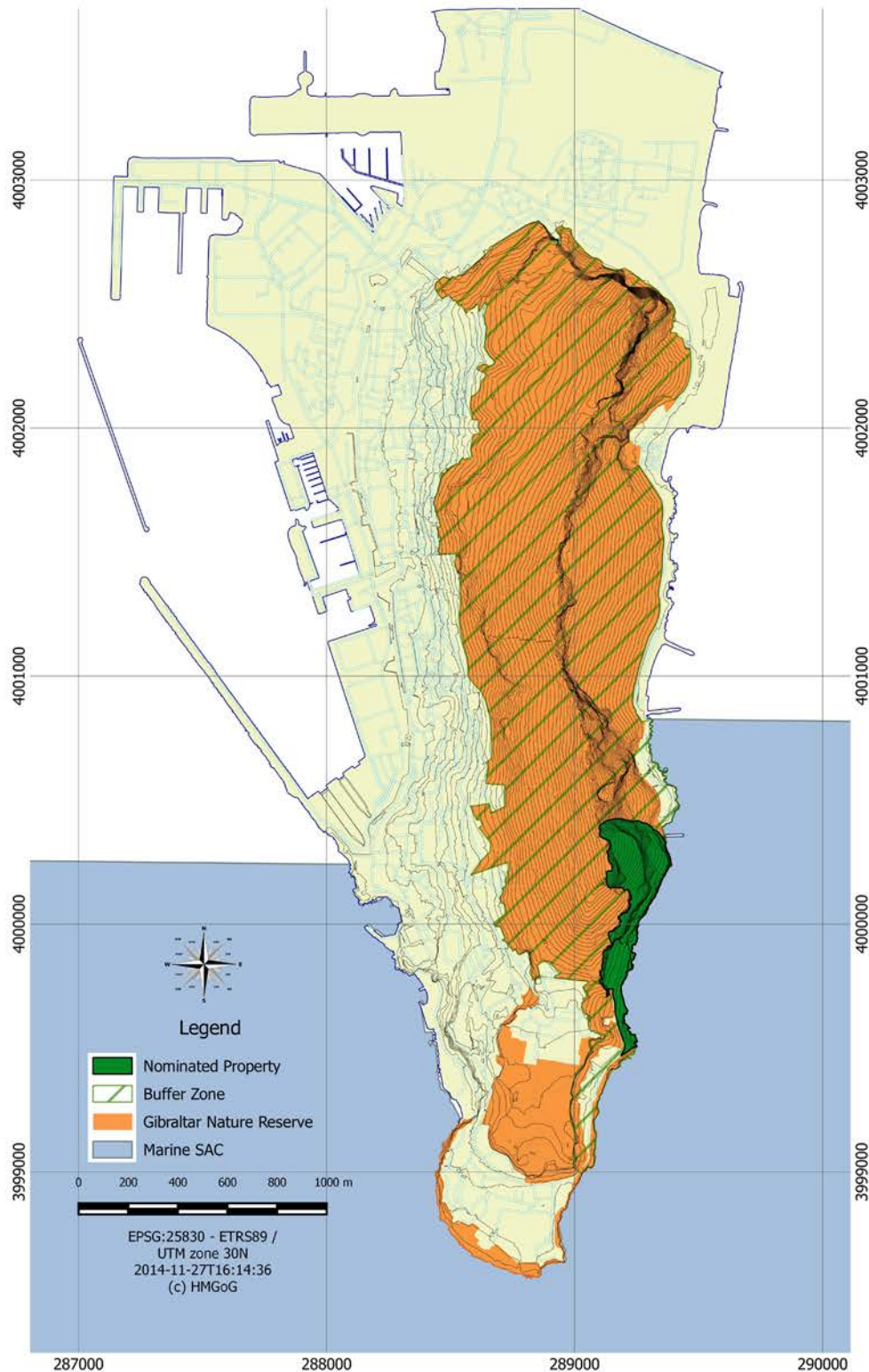


FIGURE 6 Gibraltar Nature Reserve and Marine Special Area of Conservation.

Planning is regulated by the Town Planning Acts and Regulations 1999 and 2001, and by implementation of policies contained in the Gibraltar Development Plan 2009. The current Plan contains standard policies to protect the environment and cultural heritage, and also, for the Upper Town, a series of design principles to protect and enhance character. The Plan is divided into planning zones, and currently the World Heritage Site and its buffer zones fall into three separate planning zones each with differing requirements (Figure 7).

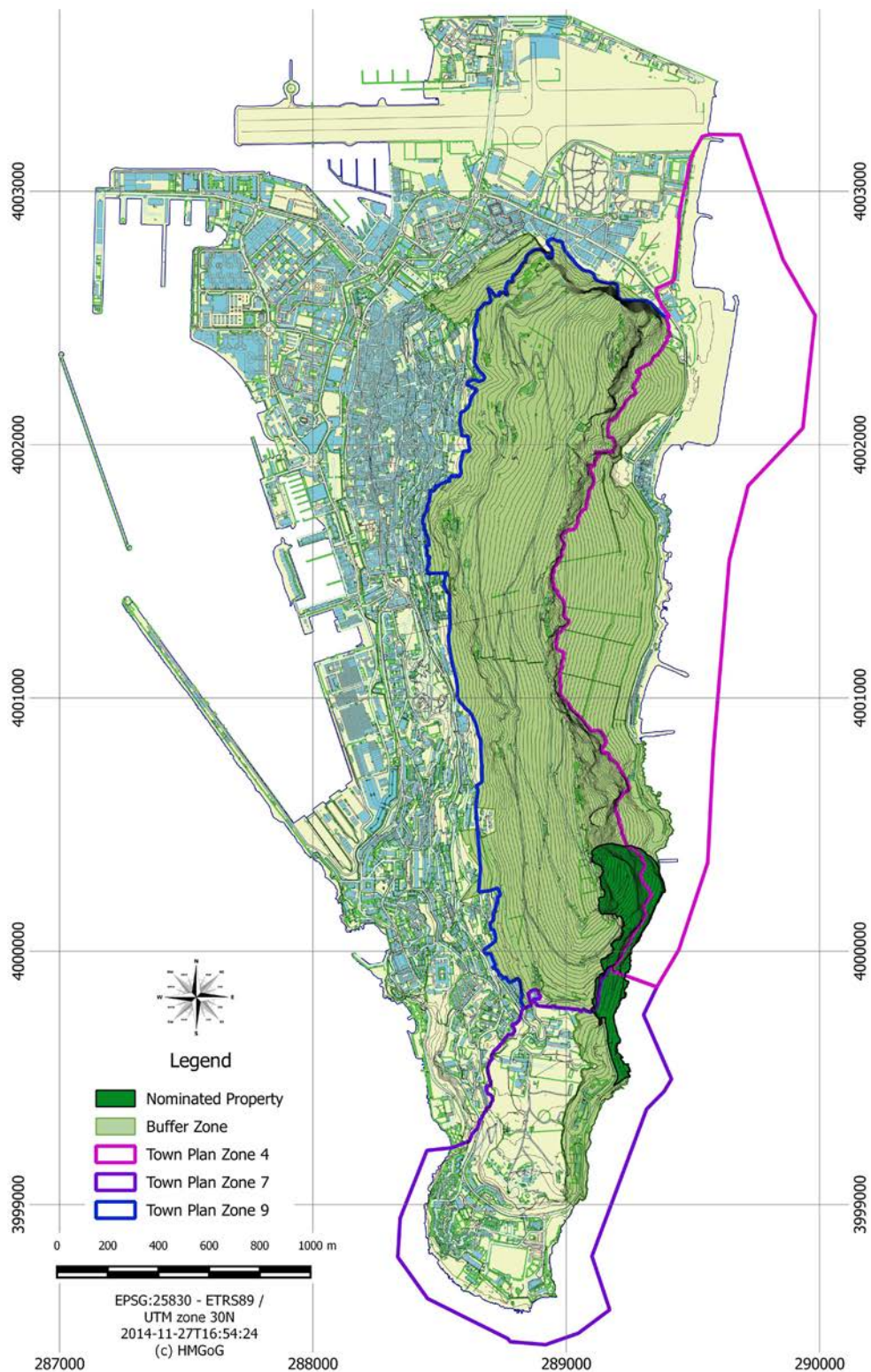


FIGURE 7 Gibraltar Development Plan Zones relevant to the Nominated Property and Buffer Zone.

Planning controls and procedures are increasingly strictly enforced by the Development and Planning Commission, as the general policy to improve Gibraltar's environment is implemented. The protection of cultural heritage assets has been increased with the introduction of site assessment and field evaluation to inform planning decisions, and the increased involvement of the Gibraltar Heritage Trust and the Gibraltar Museum in routine development control matters.

The Town Planner has drafted an Amendment to planning zones 4, 7 and 9 of the Gibraltar Development Plan 2009 which takes the nominated World Heritage property into full account with specific policies designed to safeguard the site's Outstanding Universal Value (Appendix 3). These include planning policy guidance to protect the site, the landscape, character, setting, key vistas and environment and access principles. There are also policies covering improvement and enhancement of setting and landscape quality. No development would be permitted within the boundaries of the site, with the exception of suitable development such as improved signage or interpretation, improvements to access requirements. There is a presumption against developments within the east side buffer zone, whose nature would adversely affect the site's outstanding universal value or setting. Any proposals would have to include a full environmental impact assessment utilising current ICOMOS guidance on Heritage Impact Assessments for World Heritage Sites (2010). Design and access statements would also be required. The Amendment is under review and public consultation.

There is also a long tradition of community involvement in nature and heritage conservation. The Gibraltar Ornithological and Natural History Society (GONHS) is an active non-governmental organisation (NGO) involved in nature protection and has its origins in the 1970s. The Gibraltar Heritage Trust is a statutory NGO with its origins in the first Heritage Trust Ordinance of 1987. Both are represented in the governance of the candidate site (section 20).

In the long term, the site will remain fully protected and management systems will be reviewed every five years with a view to improving areas where considered necessary.

11.3 Access and security

Visitor numbers to sensitive parts of the site will be restricted and closely monitored with an annual review of carrying capacity for areas within the property according to their sensitivity. Because of the sensitive nature of the cave deposits, access to Gorham's, Vanguard, Bennett's and Hyaena Caves is strictly controlled and only permitted with a guide approved by the Director of the Gibraltar Museum. Martin's Cave is protected by a gate on a path leading to the cave.

Enforcement of access restrictions to the most sensitive parts of the property will be reviewed annually, or more frequently on an *ad hoc* basis if needed, and the use of non-intrusive monitoring technology will be applied and improved as technology develops.

Gibraltar Neanderthals The Mediterranean Steps are open to the public and are maintained with interpretation. The relict vegetation along the cliff walk is not threatened. All wildlife is protected through being part of the Gibraltar Nature Reserve. The Upper Rock is secured at night by locked gates, with access for homeowners on the west side limited to that from the Upper Town. Local traffic, other than authorised vehicles, is not allowed on the roads above St Michael's Cave. Visitor access to the Nature Reserve is by foot, private vehicle, cable-car or taxi/bus tours. The Upper Rock is well visited and there are some issues of littering and graffiti, but little other damage. The east side Dune in the buffer zone is very difficult to access, as are the submerged landscape features. Collections are housed in secure conditions in the Museum stores and are not at risk.

11.4 Health and safety and environmental protection

Essential Health and Safety maintenance – for example on the Mediterranean Steps – is undertaken as required, but will now also take account of the need to protect the site’s Outstanding Universal Value.

11.5 Managing risk

A risk-preparedness plan has been compiled including a risk register and is appended to this Plan at Appendix 2. Assessment of risk is a standard part of any project and monitoring will be continual. Specific potential risks may be assessed using the current ICOMOS guidance on Heritage Impact Assessment for World Heritage Sites or an adapted version.

12. Fostering the gathering and dissemination of scientific information

Research underpins our understanding of the importance of the candidate site and is a central tenet of the Vision. Archaeological excavations, though naturally removing sediments, are hugely significant in enhancing knowledge and interpretation. At the same time, excavation ensures the retrieval of evidence that, in time, would be lost through natural erosion.



Gibraltar Neanderthals

PLATE
33

Research underpins our understanding of the importance of the candidate site and is a central tenet of the Vision.



PLATE 34 Annual investigations will continue, with very specific research questions, to ensure there is no loss of site integrity, and in support of the small-scale year-round project.

The excavations are carefully managed and carried out within a research framework agreed with an international committee of experts. With effect from 2015, a small archaeological team will be based in the Gibraltar Museum and will undertake small-scale excavations year-round. This approach will permit greater control over excavations and will ensure that no deposits are left unfinished until the next field season, a problem with all annual excavations. Annual investigations will continue, with very specific research questions, to ensure there is no loss of site integrity, and in support of the small-scale year-round project. Work is undertaken by an experienced and highly qualified international team, and specialists will visit the site or the collections throughout the year as part of the on-going research. The international committee of experts (International Research and Conservation Committee) meets annually and reviews annual excavation plans from the perspective of conservation and maintenance of site integrity. There will be a five-year review of that research strategy with annual monitoring and reporting of excavations (see Volume 4).

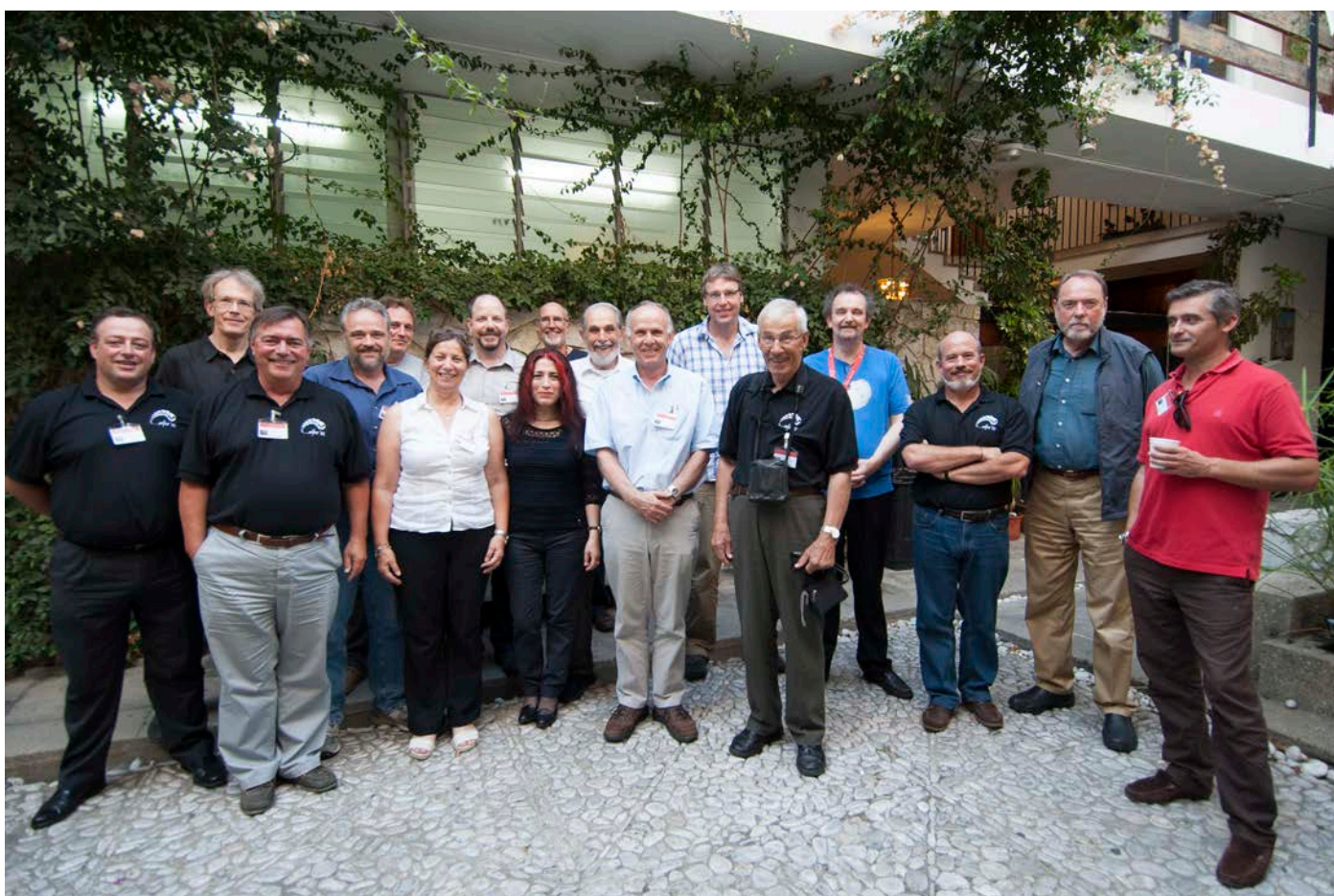
The project has already stimulated several post-graduate studies and the Gibraltar Museum will continue to promote the site to the academic community and encourage potential Masters and PhD students to take on aspects of the investigations. These will feed back into our understanding and into the interpretation and presentation of the works. Museum personnel and other experts in Gibraltar act as mentors and advisers for post-graduate students.

A key element of the research will continue to be academic publication, as well as more popular publications and public talks and lectures. The Gibraltar Museum will continue to hold the international annual Calpe Conference highlighting the theme of human evolution every third year. The knowledge gained will also feed into interpretation strategies for visitors and educational projects.

13. Local community involvement

The large number of licenced guides on the Rock (~440) gives an indication of a strong level of commitment and understanding. There are many active societies and organisations including the Gibraltar Heritage Trust, the Gibraltar Ornithological and Natural History Society and the History Society. There are frequent heritage and nature articles in the press and media and other publications. There is, in summary, a long history of awareness and active interest in the heritage of the Rock and its environs, going back to explorations of the 18th and 19th centuries at least. The history is exceptionally well-documented, and the archives provide a resource unparalleled in many areas.

Gibraltar has a long history of conservation and education. Events and programmes include schools activities and curricula, talks and lectures, international conferences such as the Calpe Conference, museum and other local exhibitions. The diverse experiences which are available offer opportunities for public engagement with their heritage at a variety of levels, in a variety of places.



Gibraltar Neanderthals

PLATE 35

The Gibraltar Museum will continue to hold the annual international Calpe Conference highlighting the theme of human evolution every third year. Photo shows 2012 Calpe Conference speakers on human evolution.



PLATE 36 Events and programmes include schools activities and curricula, talks and lectures, international conferences such as the Calpe Conference, museum and other local exhibitions. Photo shows Gibraltar Museum Open Day.

There is a local, human, infrastructure that is the community itself. Local community awareness and support for, and pride in, their natural and cultural heritage is well-embedded in many facets of their lives, including schools programmes, arts and cultural events and not least tourism. This interest is reflected in, amongst other events, the number of local visitors to the annual Gibraltar Museum Open Day, with figures in the last ten years representing between 2 and 4% of the population of Gibraltar.

TABLE 3 Number of visitors attending the Gibraltar Museum Annual Open Day in the last ten years.

Year	Number of Visitors
2005	739
2006	821
2007	533
2008	837
2009	677
2010	501
2011	700
2012	700
2013	1100
2014	755

14. Visitors and tourism

Gibraltar has a long history in tourism; it is a mainstay of the economy. The total annual visitor footfall exceeds 11 million, attracted by the wide array of heritage and natural assets and by the shops and amenities. Visitors arrive by sea, by car and coach, or as pedestrians across the land border and by air. A very high proportion of visits - c. 86% are day trips.

TABLE 4 Numbers of visitors to Gibraltar, to the Upper Rock and Museum over the last five years (land frontier and private motor vehicle figures include daily workers crossing frontier).

Year	Land frontier	Coaches	Private motor vehicle	By Air	Cruise liner	Yacht	Upper Rock	Museum
2009	9,778,300	8098	2,531,800	186,049		3422	785,763	17,274
2010	11,071,300	8174	2,800,700	152,068		3189	772,009	15,116
2011	11,424,600	8159	2,960,200	193,484		3331	829,017	16,039
2012	11,310,700	8073	2,968,200	193,623		3890	801,596	12,974
2013	10,652,800	6127	2,592,200	193,368	278,179	2452	732,228	12,495

There is a well-established tourism infrastructure to cater for visitors with many restaurants, bars and shops and a good city bus service. Destination management companies provide dedicated tours by minibus to tourist sites and this is complemented by a taxi service and tours for a more personal touch. There are currently 440 Gibraltar Tourist Board licenced guides who are trained to conduct tours by bus, taxi or the very popular walking tours. There is a spread of three to five star accommodation and more hotels are being built to cater for demand. There is Youth Hostel accommodation in the town, and an array of self-catering apartments and bed and breakfast establishments. There are currently some 198,000 rooms available annually (1200 beds).

The Upper Rock sector of the Gibraltar Nature Reserve is the mainstay of the current tourism product and within it can be found the world famous "Rock apes", Barbary Macaques that roam freely. In 2013 some 730,000 tourists visited the Upper Rock. In addition, it is well-used by local Gibraltarians as a leisure area particular on weekends and holidays



PLATE 37 Tourism visits mainly focus on the west and top of the Upper Rock and are largely by coach tour or taxi, with a significant number of visitors on foot.

Tourism visits mainly focus on the west and top of the Upper Rock and are largely by coach tour or taxi, with a significant number of visitors on foot. Unique assets such as St. Michael's Cave, the Great Siege Tunnels excavated in the late 1700s and the Moorish Castle, rebuilt in the early 1300s, give Gibraltar its rich heritage product (Figure 8). All these lie outside the nominated property but within the buffer zone. As Gibraltar has always been a "fortress", there are countless vestiges of the different occupations, from the Moorish, through the Spanish and finally to the British. Moorish baths and mosques lie side by side with synagogues and Catholic churches and all surrounded by defensive city walls and fortifications. There is a wealth of architectural styles and good vernacular buildings reflecting Gibraltar's past history and the origins of its inhabitants.

Against this backdrop, the UNESCO World Heritage bid is extremely important as, if it were to be achieved it would add another dimension to the existing product and enhance existing access to the wealth of cultural and natural assets. World Heritage Sites are magnets for some elements of the tourist market.

Gibraltar Neanderthals But in itself, a place on the United Kingdom's Tentative List has provided a catalyst to enhance the Gibraltar visitor experience and to promote awareness and understanding of the Rock's earliest inhabitants and their environments. There is now a wealth of information on where and how Middle and Upper Palaeolithic people lived and behaved, what plants, birds and animals they were familiar with and in many cases subsisted on, where they acquired materials for tools and what their environment was like. Their landscape was far greater than today with a sandy plain extending east of the cliffs where the sea lay. There are also indications of complex social behaviour and unique elements including rock engravings. The site is key in the global understanding of the Neanderthals and also the overlap with modern humans and an understanding of their demise.

The two key strands of the World Heritage Convention are conservation and presentation of the property. Articles 4, 5 and 27 of the Convention outline UNESCO’s expectations. Any visitor strategy must balance the two strands of conservation and preservation carefully. Archaeological, palaeontological and geological sites, especially those related to early humans, are generally less accessible to the public, the deposits which hold the information can be very fragile, as in the candidate site’s caves, and are of relatively lower visibility, than monumental sites. Their meaning is more difficult to grasp as a result. The Gibraltar site offers a unique challenge of interpretation and has the potential to become a model for early human sites in other parts of the world.

Article 4

Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage ... situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources...

Article 5

To ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage ..., each State Party to this Convention shall endeavour:

1. to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes;

Article 27

1. The States Parties to this Convention shall endeavour by all appropriate means, and in particular by educational and information programmes, to strengthen appreciation and respect by their peoples of the cultural and natural heritage...

The overarching strategy therefore is to provide new, diverse and high-quality experiences for visitors – and the local community – by offering a range of options for new routes and new sites to explore Gibraltar’s heritage including the candidate World Heritage Site. The options will provide for visitors by bus/taxi, visitors by sea, visitors by private vehicle and walking tours. In addition, there will be remote access to sites by digital media. The strategy has the added value of opening up historical monuments which are currently not accessible to the public.

Delivering the interpretation involves partnership-working, especially between the WHS Team, the Gibraltar Museum, the Gibraltar Tourist Board, the Gibraltar Heritage Trust (GHT), the Gibraltar Ornithological and Natural History Society (GONHS) and the Upper Rock Management. The strategy would make use of existing tourist facilities and infrastructure and encourage local businesses and individuals to work in partnership with the heritage sector and tourist board to expand the tourist product. A flexible strategy is adopted, using a raft of different mechanisms to provide information. Baseline information and interpretation will be provided by the WHS Team/Gibraltar Museum, helped by GHT and GONHS. Design and displays are agreed between all parties to ensure a consistent and coherent style. The detailed approach will be set down in a full Visitor Management Plan drafted early in 2015 (see Section 21, action 4/001).



PLATE 38 Delivering the interpretation involves partnership-working, especially between the WHS Team, the Gibraltar Museum, the Gibraltar Tourist Board, the Gibraltar Heritage Trust (GHT), the Gibraltar Ornithological & Natural History Society (GONHS) and the Upper Rock Management. Photo shows stakeholders at meeting of World Heritage Bid Steering Committee.

There are many audiences to cater for in seeking to enhance information about the candidate site and other cultural and natural heritage assets:

- (a) Visitors and tourists (visitors to the Town only; visitors by car and taxi to the Upper Rock sector of the Gibraltar Nature Reserve and heritage attractions; visitors to the Upper Rock on foot or by cable car/foot; visitors to the Upper Rock, Mediterranean Steps and top of the Rock; visitors to Europa Point by car or foot; and visitors taking boat tours).
- (b) Global community (Web site visitors/virtual reality tours).
- (c) Academic and professional community (both local and international).
- (d) Local schools and those further afield (primary schools; secondary schools; and sixth form colleges).
- (e) Local community (residents within the buffer zone and immediate environs; residents elsewhere on the Rock; businesses; social enterprises; local societies and Government).

There is already a substantial commitment to improving the visitor experience. Information boards and improved signage are provided at all key points for visitors including (but not exclusively) the airport, Casemates Square, tourist information centres, Europa Point, Upper Rock sites including the Mediterranean Steps, and at the viewing platforms on the Europa Advance Batteries. Leaflets on the candidate property will be available in tourist information centres, and at a range of places including the airport, hotels, restaurants, shops and the museum.

In addition to improved information and signage in existing tourist areas, a range of new routes to explore Gibraltar's heritage including the nominated WH property are being implemented. These are:

- (a) An interpretation centre at Parson's Lodge Battery, Rosia Bay: this is on the tourist route that is taken by buses and taxis en route to the southernmost part of Gibraltar, Europa Point, that overlooks the Strait of Gibraltar and its impressive views of Africa and Jebel Musa – known in classical times as *Mons Abyla*, the southern Pillar of Hercules (*Mons Calpe* - Gibraltar - being the northern Pillar). This site, together with the Gibraltar Museum, will be a focal point for the interpretation of the Caves which are otherwise inaccessible.
- (b) Specialised boat trips to view the property from the sea will be introduced. Two offerings will be available: a dedicated tour that included a visit to the interpretation centre at Parson's Lodge, followed by a boat trip to the Gorham's Cave complex; and inclusion of the Gorham's Cave complex into existing dolphin boat trips that currently operate in Gibraltar.
- (c) Enhanced signage and information boards around the Mediterranean Steps will explain the "Neanderthal Story" throughout this extensive walk to the highest point of the Rock of Gibraltar at 426m AOD. The walk takes visitors through a landscape full of plants which were present when the Neanderthals walked the Rock – one of the key messages of the interpretation strategy. Viewing platforms and information points will be put in place at the Europa Advance Batteries; and information will be available at all key tourist points, such as the Gibraltar Museum, Europa Point, Casemates and the airport. Parking for coaches and cars will be available at the viewing points and Europa Point.



Gibraltar Neanderthals

PLATE 39 Current displays at the Gibraltar Museum representing the Neanderthals in the context of the Gibraltar caves and environments.

(d) A field study and research centre at the Moorish Castle housing *inter alia* the collections from the nominated property. The development of this site will release space for expansion of displays within the Gibraltar Museum and will have the added value of opening up a new historical monument to visitors.

(e) New displays at the Gibraltar Museum enabled by the expansion of display space.

(f) Guided walking tours allow visitors to have access to the interpretation centre, the Gorham's Cave complex viewing platforms (Europa Advance Batteries) and the walk through Mediterranean Steps.

(g) Enhanced web access includes an updated tourism web site, and a dedicated web site for the property including virtual tours of the caves and landscape.

The key intent of the visitor management and interpretation strategy is to raise awareness and public understanding – education and informing in its widest sense – about the site and its values, but also about UNESCO's role and aspirations. Good quality visitor experience is essential and the strategy aims to provide a high quality service, accessible to all, through the range of options above.

Key messages in the interpretation strategy cover:

(a) why the site is important in global terms – perceptions and values;

(b) walking with Neanderthals;

(c) what it tells us about the human past, survival or failure to adapt;

(d) what it tells us about geological and environmental change, including past climate change;

(e) how we can learn from these changes;

(f) the need for conservation of the fragile environment of the site and setting;

(g) respect for the natural and cultural heritage;

(h) heritage in community life; and

(i) what such sites mean in the global context - UNESCO and a sustainable and peaceful future.

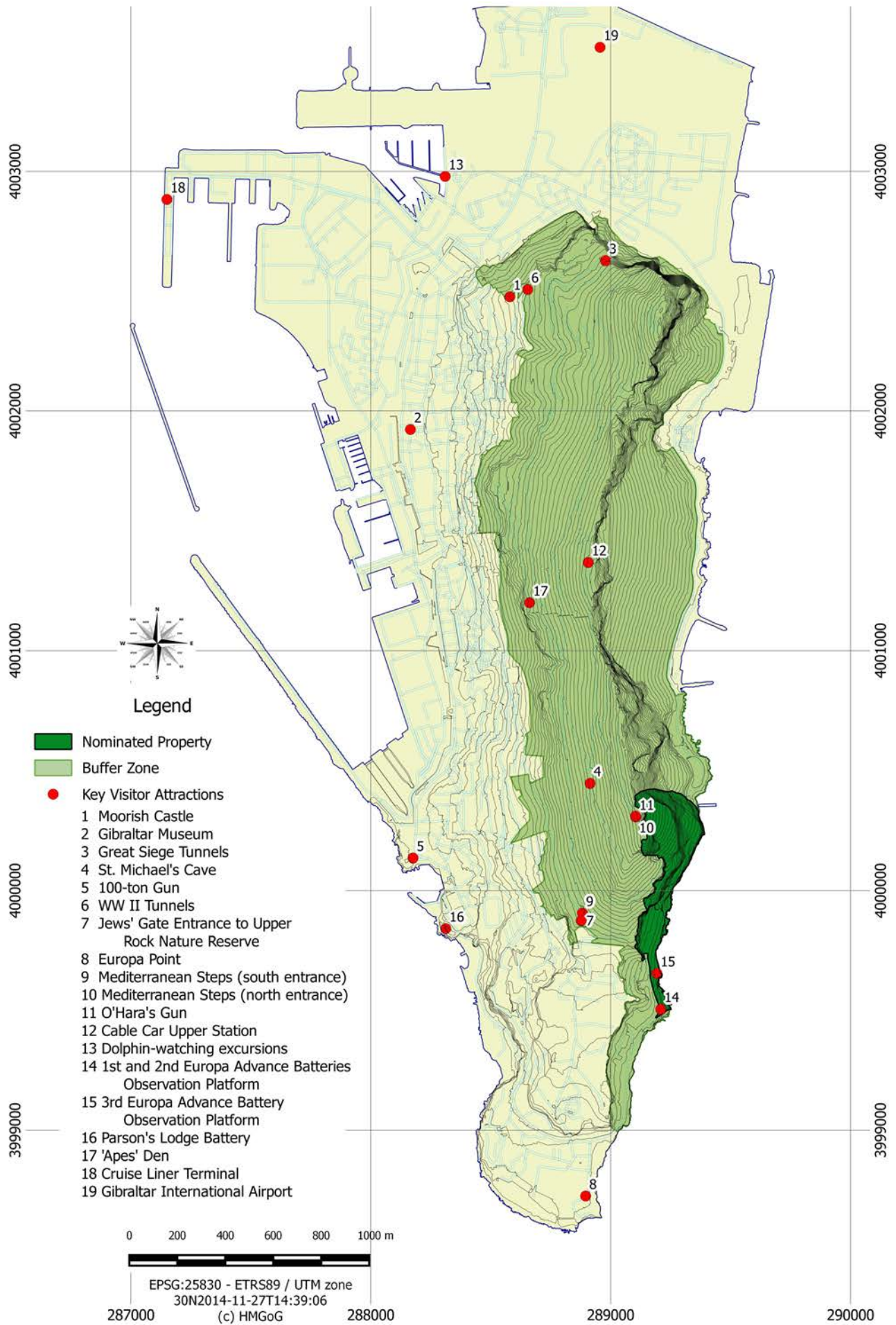


FIGURE 8 Location of main tourist sites in Gibraltar.

Within the property, visitors are focused on the Upper Rock (Figure 8). The Mediterranean Steps are accessed from the west side at Jews' Gate, where visits are on foot, either completely or via the cable car to the top of the Rock and to O'Hara's Battery where the Mediterranean Steps reach the apex of the Rock. Preliminary statistics of visitor numbers to Europa Point and the Mediterranean Steps, based on a survey conducted in July and August, 2014, offer a glimpse of potential visitor numbers to the Europa Advance site and to Mediterranean Steps. This survey revealed that the annual number of visitors to Mediterranean Steps was expected to be around 24,000 ($24,061 \pm 10,527$, at 2σ) and the number of visitors to Europa Point around 203,000 ($202,810 \pm 80,516$, at 2σ). Using the Upper Rock as reference point, as it receives the most number of visitors, then Europa Point receives around 27% of the Upper Rock traffic; Mediterranean Steps receives 3% and the Gibraltar Museum 2%. Access by use of the Mediterranean Steps is safe and appropriate to the site, though visitors need to take care on the steep slopes and steps. Few visitors stray off the established paths. There are appropriate safety barriers where cliff edges are close to paths.

There is some signage and information boards along the Mediterranean Steps, but it is currently small scale in an effort not to clutter a place of natural beauty. There is significant scope to improve information and provide better interpretation in an appropriate manner and scale, and this is in hand with new signs starting to be put up on the Upper Rock from July 2014. The remainder of the property has significantly fewer visits because of its present lack of access. The Gorham's Caves Complex has restricted access with guided tours of <20 people at any one time.

Collections of Middle and Upper Palaeolithic material, including those from the excavations of the caves, can be viewed at the Gibraltar Museum in town. The Gibraltar Museum is additionally part of the Ice Age Europe Project (<http://www.ice-age-europe.eu/>) which is developing visitor facility infrastructure across a network of major sites in Europe.

Overall, current facilities are suitable for the visitor market. Facilities on the Upper Rock have been improved since 2013 and include better provision for disabled access. The new range of options for visitors (e.g. the interpretation centre at Parson's Lodge) will enhance visitor facilities even further. All such improvements will support the vision, aims and objectives of the Management Plan in providing responsible access to and interpretation of the nominated property.

15. Social media and remote access to information

The use of digital media has proved very successful in engaging the local community. In addition to the museum's website in which day logs of excavations are posted, the museum also has a Facebook Group on Gorham's Cave and the World Heritage Bid (<https://www.facebook.com/groups/202777843167670/>) which has 4,240 members (November 2014). Its role is stated as:

- (a) To inform as many people as possible on the values of the Gorham's Cave Complex. Why it is so special and unique in the world and why it deserves to become a World Heritage Site; and
- (b) to ask for your support by joining our page. It is vitally important for us to show that this bid has the support of the local community, and also from people throughout the world."

Information from the archaeological studies and surveys can be made available via the internet on a dedicated web site. This information includes digital surveys of caves, and videos which will form the basis of virtual tours.

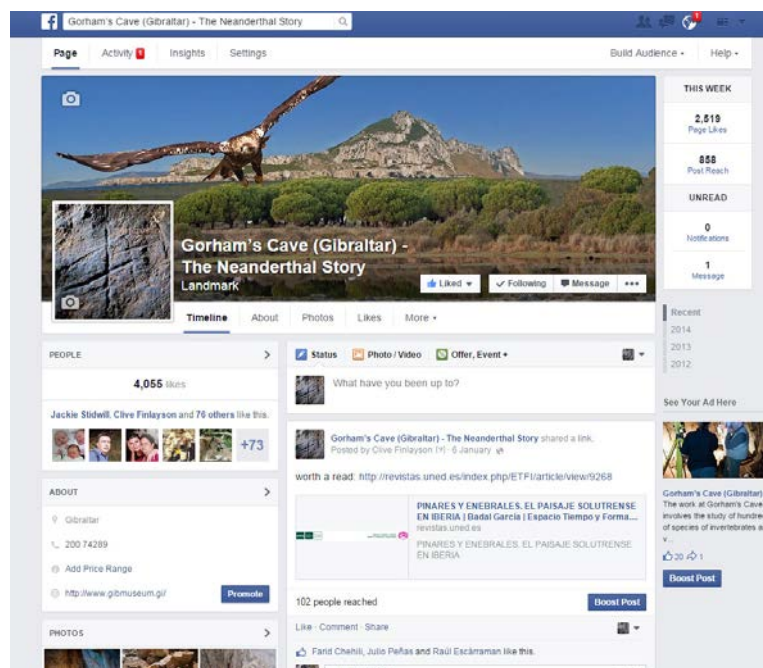


PLATE 40 The museum has a Facebook Group on Gorham's Cave and the World Heritage Bid.

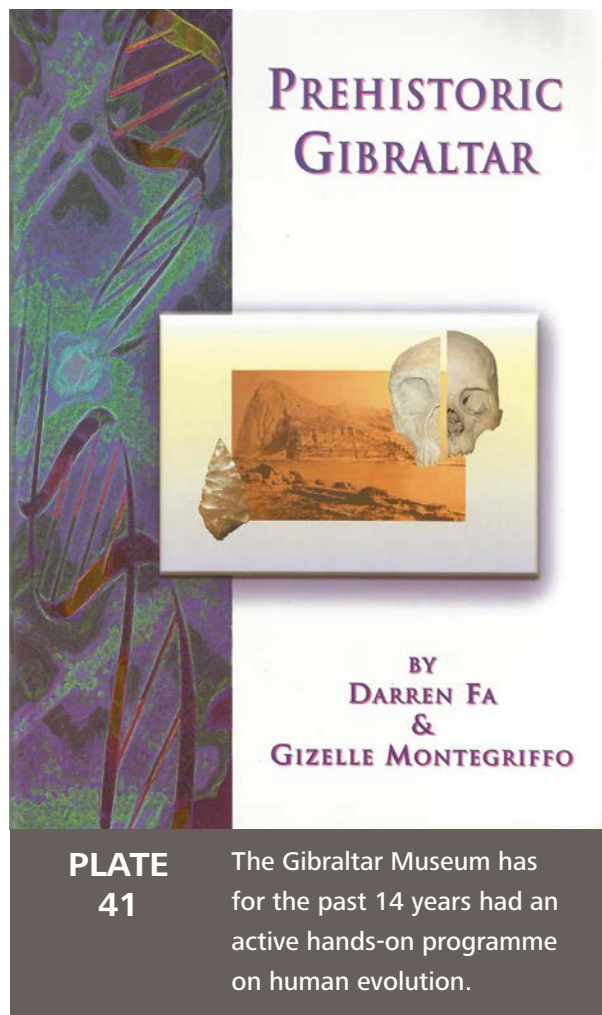


PLATE 41 The Gibraltar Museum has for the past 14 years had an active hands-on programme on human evolution.

16. Enhanced educational and lifelong learning activities

The Gibraltar Museum has for the past 14 years had an active hands-on programme on human evolution, including the Neanderthals, for local schools and also visiting schools from abroad. It is run in conjunction with the Department of Education. The programme includes books, worksheets and teaching aids, including box tool-kits, which are kept in each school and also in the Gibraltar Museum. The development of experimental archaeology demonstrations in the Parson's Lodge Field Centre is seen as a continuation in the development of this Educational Programme which has been welcomed in the many international fora in which it has been presented.

As part of its activities promoting the Neanderthals and the work inside the property, the Gibraltar Museum organises an annual public lecture series. This is well-attended reflecting local interest in the subject. In addition, every third year, the annual international Calpe Conference, which is sponsored by the Government of Gibraltar, develops the human evolution theme. An impressive array of international speakers attends the conference which is open and free to the local community. In this way, they are exposed to the leading researchers in this field, which is unique for a community of its size.

Services and activities will expand to include education packs for schools on the property and on UNESCO/global citizenship; talks to schools and specific activities related to the property, and to global citizenship, covering the range of archaeological, environmental, geological and landscape elements, and arts-based interpretation including music, dance and drama.

World Heritage Day will become part of the annual round of international celebrations, and participation in the World Heritage Youth Forum will be encouraged. Schools activities are designed in consultation with teaching staff and the Education Department. There will be a focus on groups who may not normally exploit the services readily available.

17. Contributing to sustainable development in the Gibraltar context

The Gibraltar Museum will make an active contribution to heritage-led regeneration in Gibraltar through this project. There will be opportunities for job creation both within the heritage sector and in allied sectors including tourism.

The project will support the Tourist Board and Upper Rock Management in supplying accurate and informative material about the cultural and natural heritage. It can also assist in the development of new tourism options linked to the cruise market and package tourists, by providing both information and people to act as informed guides for well-designed niche tours, courses or lectures.



Gibraltar Neanderthals

PLATE 42 Options also exist for the development of a world location for studies in human evolution, of historic coastal military and defence systems, in the medieval archaeology of the western Mediterranean and in natural and cultural conservation management.

The concept of a broader 'passport' to Gibraltar's cultural and natural heritage will be explored to encourage longer stays and return visits. This could take the form of all-inclusive tickets to various heritage sites, the Museum, water-borne interpretation, in conjunction with business partners.

Options may also exist for the development in the longer term of the notion of a world location for studies in human evolution, in studies of historic coastal military and defence systems, in the medieval archaeology of the western Mediterranean using the Moorish Castle as a base, and studies in natural and cultural conservation management.

18. Promoting and supporting UNESCO's aspirations in sustainable development

The World Heritage Convention is not solely about prestige and the identification of places of Outstanding Universal Value. It is a tool which UNESCO has in order to achieve its wider aspirations in promoting global sustainable development and reducing poverty. Gibraltar has much to offer in this aspect and the project will seek to develop links with developing countries, and offer opportunities for capacity-building and training in cultural and natural heritage management. The project will also explore options for an integrated heritage management learning centre. The project will also seek to develop activities and courses for rehabilitation and recovery for civilian and military people.

Partnerships and sharing knowledge will underpin the entire project, from the composition of archaeological, science and conservation teams to working with local community groups and businesses participating in delivery of Management Plan objectives.

19. Exemplary World Heritage Site management

Underpinning the management of the site is a need for sound processes and principles. Partnership is a fundamental consideration of UNESCO in managing World Heritage Sites, and, although always a challenge, the maintenance and development of partnerships that will enable the Plan to be achieved is critical.

Alongside this, there is a need for strong, accountable and transparent governance for decision-making, a secure, long-term resource base and back-office and administrative support. Policies relating to monitoring and evaluation are also essential in order to ensure that we can learn from past work, and disseminate good practice.

A fit-for-purpose governance system is in place (section 20), along with monitoring indicators (section 22) and review processes. The management will ensure that there is accountability and transparency of decision-making affecting the site, and that the work is for the public benefit, through its review meetings and monitoring.

Relationships with Government and all partners will be clear with respect to the management of the site. New partnerships with local, regional or international bodies will be established where it is beneficial to the site and Gibraltar.

HM Government of Gibraltar will ensure that the World Heritage Team is maintained as the key implementation body for the Management Plan, and will ensure that there are sufficient resources to enable effective delivery of the Vision and Management Plan.

The World Heritage Team will provide support and advice to other world heritage sites at their request and where HMGoG considers it appropriate and beneficial.

20. Governance and management

In order to give substance to the vision and objectives, and to implement successfully the action plan, a system of governance has been put in place. The Convention on the Protection of World Cultural and Natural Heritage (UNESCO 1972) sets out the obligations that each State Party, signatory to the Convention, commits to, in order to care for its world heritage properties:

“Each State Party to this Convention recognises that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage referred to in Articles 1 and 2 and situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain” (World Heritage Convention, Article 4).

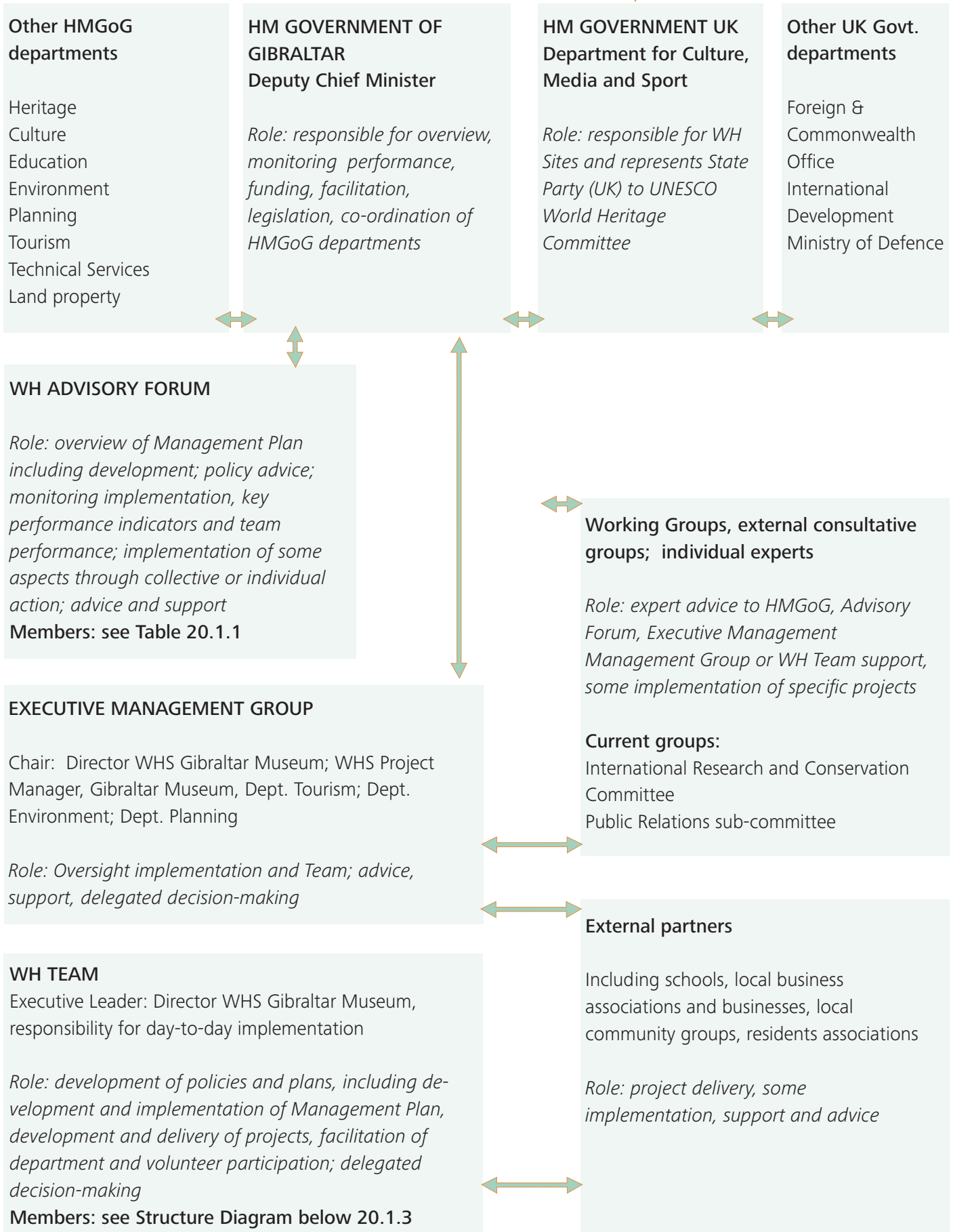
The World Heritage Convention Operational Guidelines set out the procedure for management of World Heritage Sites which focus on the five main operational aspects highlighted above. World Heritage properties are inscribed as such because they have Outstanding Universal Value. The State Party has a duty to ensure that World Heritage Sites within its jurisdiction are protected for present and future generations, via statutory powers and sustainable management. Appropriate management frameworks and management plans are the appropriate tools to meet these obligations.

HM Government of the United Kingdom (HMGoUK) is the State Party to the World Heritage Convention. Responsibility for meeting the Convention’s obligations ultimately rests with the Department for Culture, Media and Sport (DCMS). However, responsibility for the candidate World Heritage Site rests with HM Government of Gibraltar (HMGoG). HMGoG has statutory powers to enact legislation and to control all areas, including town planning, which have a potential impact on the protection and management of the site. HMGoG through its operator, the Gibraltar Museum, has day-to-day responsibility for the care and management of the physical assets that confer Outstanding Universal Value.

20.1 Governance structure for Gibraltar Neanderthal Caves and Environments

To provide a structure for managing the candidate WHS a consultation framework has been in place since 2013 to bring together the principal management bodies. At present a broad spectrum of stakeholders constitute a Steering Committee. Once inscribed, this Steering Committee will become the Advisory Forum (section 20.1.1). The WHS management will be overseen by this Advisory Forum - representing relevant government departments, non-departmental organisations with interests in the property, community and business representatives, and technical support bodies from the UK which advises the UK Government on world heritage. The Deputy Chief Minister will be the Chairman of the Advisory Forum. This Forum will replace the WHS Steering Group established in 2013 to oversee the production of the nomination. The Advisory Forum will oversee the project and will contribute to developing the Management Plan and its revisions, monitoring its implementation, and providing policy advice and support. The composition of the Forum is very similar to that of the Steering Group.

UNESCO



The Forum is responsible, on behalf of HMGoG, for overseeing the production and implementation of the Management Plan and providing information for periodic reporting to UNESCO. It will specifically monitor the key performance indicators listed in section 22. Members of the Forum may be responsible for implementation of some aspects through collective or individual action, and may assist in promoting the property and its values within Gibraltar and further afield. The Advisory Forum will normally meet once a year (or more often if required); but it is not, however, a decision-making body. Decision-making rests with either HMGoG, with the World Heritage Executive Management Group (EMG, below) or the WH Team as delegated.

20.1.1 Composition of Advisory Forum

Organisation	Individual	Role
HM Government of Gibraltar Deputy Chief Minister	Dr J Garcia	Advisory Forum Chairman
Gibraltar Museum	Professor C Finlayson	Director World Heritage Site. Delegated responsibility from HMGoG for management of the World Heritage Site Executive Management Group Chair. Specific responsibility for research. Executive Leader WH Team
Gibraltar Museum	Dr G Finlayson	World Heritage Site Coordinator. Specific responsibility for site conservation.
Department of the Environment	Dr L Mesilio-Torres	Member EMG, Member WH EMG
Planning Department	Mr P Origo	Town Planner, Member WH EMG
Office of the Deputy Chief Minister	Mr M Sanguinetti	Project Manager, Member WH EMG
Gibraltar University	Dr D Fa	Education
Office of the Deputy Chief Minister	Mr C Sanchez	The Deputy Chief Minister has overall responsibility for the World Heritage Site, as its management involves a number of government departments and NGOs.
Gibraltar Tourist Board	Mr N Guerrero	Member WH EMG
Gibraltar Botanic Gardens	Dr K Bensusan	Director
Gibraltar Museum	Mr S Finlayson	WHS Operations, Interpretation and Projects
Ministry of Defence	Nominated representative	MOD property management and security
Gibraltar Heritage Trust	Dr K Farrell	NGO with a statutory responsibility for cultural heritage, representing the local community
Gibraltar Ornithological and Natural History Society	Mr C Perez	NGO, representing the local community
Nature Conservancy Council	Dr A Menez	HMGoG appointed body
International Conservation and Science Committee	Professor M Yang	Standing Committee
HMGoUK Department for Culture, Media and Sport	Nominated representative	State Party Liaison

The principal management organisations act collectively in the EMG to implement the Management Plan. Responsibility for day-to-day policy and operational matters sits with EMG. HMGoG has delegated responsibility for the world heritage property to the Director of the Gibraltar Museum, who will for these purposes be called the Director of the World Heritage Site (DWHS).

The DWHS is responsible overall for developing policy, strategy and the Management Plan, and for its implementation, for preparing reports to the Advisory Forum and HMGoG, for promotion and operation of the site. DWHS is the executive leader of a World Heritage Team (WHT), based at the Gibraltar Museum and at a number of interpretation and field centres (see structure diagram in section 20.1.3). Delegated authority will be set down in detail as relevant.

Support for the EMG and WHT will be provided through Government Departments, by the Gibraltar Heritage Trust and the Gibraltar Ornithological and Natural History Society, and other members of the Advisory Forum. In addition there is a standing committee – the International Research and Conservation Committee - to advise on research and conservation, including balance between investigation and conservation and archaeological investigations. Its main remit is to provide guidance and peer scrutiny of archaeological, palaeontological, geological and conservation management matters. It also assists in disseminating information about the site. It has an international membership (below 20.1.2), and will formally agree research and conservation strategies.

Ad hoc task-and-finish groups will be appointed for specific elements as needed – for example on interpretation strategy, community engagement *inter alia*. Archaeological and scientific investigations will continue in partnership with the international team already established which currently includes universities and museums in the United Kingdom, Spain, and other countries (Volume 4, Table 1).

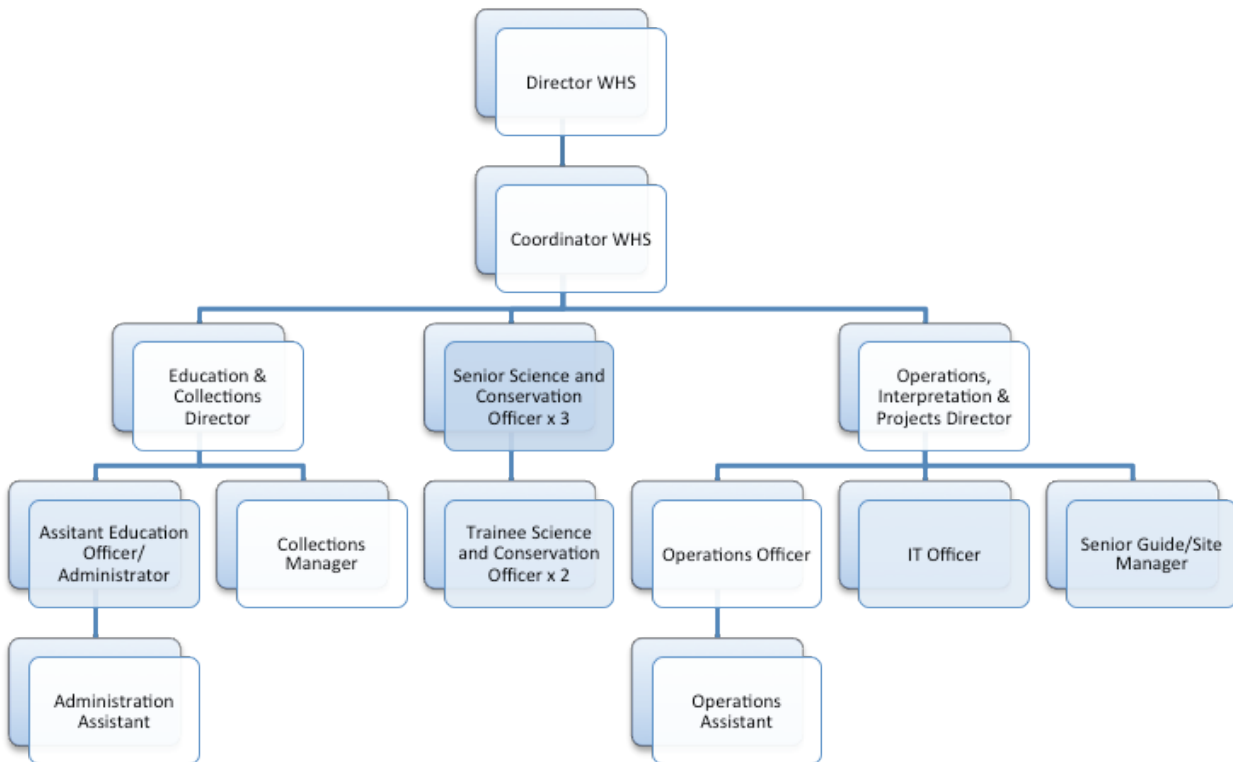
20.1.2 International Research and Conservation Committee membership

Individual	Role	Organisation
Professor Minja Yang	Chair	President RLICC, Louvain, Belgium, and former Deputy Director at the World Heritage Centre in Paris
Professor Geoff Bailey	Member	University of York, United Kingdom
Professor Eudald Carbonell	Member	University of Tarragona and Atapuerca WH Site, Spain
Dr Juan Jose Negro	Member	Doñana Biological Station, WH Site, Spain
Professor Mina Weinstein Evron	Member	University of Haifa, Israel, and Mount Carmel WH Site
Professor Clive Finlayson	Member	Director, Gibraltar Museum and nominated World Heritage Site
Dr Geraldine Finlayson	Secretary	Director Heritage and Environmental Services, Gibraltar Museum, and nominated World Heritage Site Coordinator

20.1.3 Current structure for the candidate World Heritage Site team based at the Gibraltar Museum

The current agreed structure of the WH Team is shown below; it is led by the Director of the Gibraltar Museum. This structure includes three new posts and four seconded posts approved by HMGoG as part of its commitment to the nomination process. The Museum Staff has been strengthened by new IT and Administrative posts and graduate trainees. Museum education and site guide services have also been strengthened by recent recruitment. Staff levels will be reviewed annually.

WH Team roles will also cross-utilise existing staff who will take on additional responsibilities. The total number of Gibraltar Museum staff with a direct role in the management and conservation of the nominated property will initially be fifteen. The WH Team will be based within the Gibraltar Museum, with satellite bases in the new Interpretation Centre at Parson’s Lodge and the Field Centre at the Moorish Castle.



20.1.4 Skills and expertise available

Good management of the property requires a wide range of skills from professional and academic expertise to technical maintenance. The work on the nominated World Heritage Site has been undertaken to date as a partnership involving local Gibraltar organisations and a large international team. The expertise within that team is extensive. It is proposed to continue to work and manage the property as a partnership enterprise ensuring key skills are available in-house in the dedicated WH team or in the immediate support from local departments and organisations, with the necessary other specialist and professional skills brought in as needed. Technical, maintenance and support services will largely be locally-sourced, but will also be sought from specialist organisations outside – for example craft skills - as necessary. The table below indicates skills and expertise available.

Expertise	Museum Staff	Other Local sources	Internationally
Terrestrial Archaeology and History	*	*	*
Marine Archaeology and History	*		*
Documentary Research	*	*	
Palaeontology	*		*
Zoology	*	*	
Botany	*	*	
Geology			*
Artefact/material conservation	*	*	*
Collections Management	*	*	
Museum Display/exhibition	*	*	
IT & Database management	*	*	
Research & Publications	*	*	
Photography	*	*	
Conservation Management	*		
Cultural Heritage, policy and implementation	*	*	
Environmental	*	*	
Archives and documentation	*	*	
Visitor management	*	*	
Interpretation and display	*	*	
Health & safety		*	
Finance	*	*	
Human resources	*	*	
Project management	*	*	
Graphics	*	*	
Mapping and Survey	*	*	
Buildings maintenance		*	

Existing skills and expertise within the WH Team itself include archaeology, marine & terrestrial, palaeontology, zoology, botany, geology, conservation management, policy development, education, interpretation, display, event organisation, project and operational management, human resources.

There is an established and highly-qualified, experienced international team investigating the caves, including UK, Spanish and other international universities, research institutions, museums, heritage organisations, archaeological specialists and technical advisers. Locally there is also substantive expertise in the Gibraltar Heritage Trust and the Gibraltar Ornithological and Natural History Society, the licenced guides and others. There is an extensive list of academic and other publications.

Systems for property management, promotion and visitation are already in place through a number of Government Departments and non-governmental organisations. It includes the Gibraltar Tourist Board with a staff of 77 and a complement of 440 licenced guides. The Department of the Environment Team consists of 28 which includes an Upper Rock Team, an Environmental Monitoring section and Environmental Protection Officers. There is additional support from other Government Departments and expertise from NGOs (e.g. Gibraltar Ornithological and Natural History Society).

21. Works plan

This is a rolling programme – a ‘living document’ of specific activities and tasks linked to the policy objectives. The Works Plan will be reviewed weekly or monthly as appropriate by the Director and WH Team. The Policy Objectives numbered in the table are:

- (1) To safeguard the site’s Outstanding Universal Value;
- (2) To foster the gathering and dissemination of scientific information about the site;
- (3) To promote awareness and understanding of the site’s Outstanding Universal Value;
- (4) To welcome local people and visitors to the site at levels which it can sustain;
- (5) To provide a high quality range of educational information and services about the site;
- (6) To ensure that World Heritage Site status assists wider sustainable development objectives within Gibraltar;
- (7) To promote and support the aspirations of UNESCO in sustainable development, inter-cultural dialogue and the relief of poverty; and
- (8) To be an exemplary model for World Heritage Site Management.

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
Principal Policy Objective 1: to safeguard the site’s Outstanding Universal Value						
1/001	Removal of old scaffolds and of all metal and other allochthonous materials on Governor’s Beach	4, 8	6, 8	Works commenced in December 2013.	Completed August 2014	Gibraltar Museum
1/002	Listing of sites in Heritage Act	1	9	The inclusion of attributes not currently listed.	Completed December 2014	Gibraltar Museum and GHT
1/003	Extension of Nature Reserve boundary to cover entire Catalan Bay Sand Dune	8	9	The inclusion of a small strip by Sir Herbert Miles Road. In hand.	January 2015	Environment Dept.
1/004	Establishment of WH Team	2-8	1-11, 42	Currently being finalised with approval of new staff given.	December 2014	Director WHS

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
1/005	Draft Research and Conservation Strategy Framework circulated to IRCC for comment	2-8	12-15	The draft Research Strategy is Volume 4 of the Nomination Dossier.	January 2015	Director WHS
1/006	Cliff protection and stabilisation works at the Gorham's Cave Complex	2, 4	6,	Removal and replacement of old security mesh and placement of rock fall protection fence. Under supervision of Technical Services Dept. and Golders Associates. Survey has been undertaken and works are expected to commence early in 2015.	February 2015	Gibraltar Museum
1/007	Establishment of WH Executive Management Group	2-8	41	Working currently <i>ad hoc</i> . It will be formalised on submission of nomination.	February 2015	Director WHS
1/008	Amendments to 2009 Development Plan adopted formally	3, 6, 8	11	Amendments to include policies and guidance relating to the nominated property for 2009 Development Plan Zones 4, 7 and 9.	March 2015	Town Planner
1/009	Review heritage database	1, 2, 4, 5, 8	1	Ensure all activities and monitoring reflected in integrated database.	March 2015	WH Team, Gibraltar Museum
1/010	Reduce visual impact of existing buildings (blend colour with background) and structures close to the site	3, 4, 8	6	Part of a regular programme.	March 2015	WH Team, Town Planner
1/011	Removal of old incinerator plant at Europa Advance Road	4	6	An eyesore within the buffer zone that is in the process of being dismantled.	March 2015	Environment Dept.
1/012	Repair of steps leading down to Gorham's and Vanguard Caves	2, 4, 8	6, 8, 13, 24, 26	To commence after completion of cliff stabilisation though parts may be done in parallel.	April 2015	Gibraltar Museum

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
1/013	Approval of Research and Conservation Strategy (Volume 4)	2-8	8, 12-14,		March 2015	Chair IRCC, Director WHS
1/014	Removal of metal structures from Catalan Bay Sand Dune (buffer zone)	4, 8	6, 8	To be part of a regular maintenance programme with early removal of worse elements.	April 2015	Technical Services Dept.
1/015	Repair and enhancement of cliff walls in buffer zone along Europa Advance Battery	3, 4, 6, 8	6, 8, 22		July 2015	Technical Services Dept.
1/016	Management Criteria Study	2, 3, 8	1, 5, 7, 9	Quantitative evaluation of all heritage and natural assets within the candidate WHS.	On-going	Director WHS
1/017	Monitoring condition of WHS cultural attributes - develop methodology and implement	2, 3, 4, 8	1, 5, 7, 8	WH Team monthly photographic and written survey cave deposits.	Commenced December 2014 and on-going	WH Team
1/018	Monitoring WHS natural attributes; check methodology and implement	2, 3, 4, 8	1-4, 8	WH Team, GONHS. Need to ensure integrated into property management database.	Well-established and on-going	WH Team, GONHS
1/019	Monitoring of species	4, 5, 8	2	GONHS and the Gibraltar Museum collaborate in keeping records as part of an active biological monitoring programme. The programme includes cave-dwelling species of invertebrates and bats.	Already well-established; on-going	Gibraltar Museum & GONHS
1/020	Enactment of new Heritage Act	3, 4, 5, 8	9	In hand.	2015	Ministry for Heritage

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
1/021	Programme of replanting natural vegetation	4	6, 22	Using species recorded in cave fossil record, especially <i>Pinus pinea</i> and <i>Juniperus</i> sp. These will have the double function of landscape regeneration and dune stabilisation. Replanting will be focused on the Catalan Bay Sand Dune and the buffer zone at Europa Advance Road. The programme is expected to commence early in 2015 and will be on-going.	On-going	Environment Dept., Director WHS
1/022	Removal of graffiti from caves	3, 4	8, 22	To be part of a regular maintenance programme with early removal of worse elements.	On-going	Gibraltar Museum
1/023	Annual meetings of international Research and Conservation Committee (IRCC)	2, 3, 4, 7, 8	12-15	Commenced in September 2014.	On-going	Director WHS
1/024	Laying of underwater protection barrier outside Gorham's and Vanguard Caves		7	To address medium- to long-term issues of erosion due to sea level rise. No immediate concern but under discussion.	On-going	Technical Services Dept.
1/025	Monitor planning applications	3, 4, 5, 8	10, 11		On-going	WH Team
1/026	Translocation of refuse facility in quarry opposite 3rd Europa Advance Battery	4, 8	6, 8, 22	Will be moved and converted into a parking facility for the viewing platforms once new waste disposal facility is completed.	2016	Technical Services Dept.
1/027	Relocation of museum collections to new site at Moorish Castle	2, 4, 5, 7, 8	22	Once works on site enable transfer. In the meantime cared for in current stores by Collections Manager.	March 2016	Gibraltar Museum

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
1/028	Establishment of WH Advisory Forum	2-8	41	Currently catered by WH Steering Committee established December 2013	June 2016	Deputy Chief Minister, Director WHS
Principal Policy Objective 2: to foster the gathering and dissemination of scientific information about the site						
2/001	Trial soundings in Martin's Cave	1, 4, 5	13, 14, 15	Taking the opportunity of suspension of activities in Gorham's and Vanguard Caves with the aim of establishing the stratigraphic sequence of this cave and the potential for future work.	Completed July 2014	Gibraltar Museum
2/002	Annual Plans for Excavations at Gorham's Cave		13-15	Based on Research Framework agreed with IRCC.	April 2015	WH Team
2/003	Excavations at Gorham's and Vanguard Caves	1, 4, 5, 8	13-15	Suspended for 2014 due to works on site, but to resume in March 2015 on a small-scale approach with targeted annual excavations in the summer each year as required.	On-going	WH Team
2/004	Continuing publication of results in international peer-reviewed journals	3, 4, 8	15	Ensure list in WHS management database.	On-going	Director WHS, WH Team and Partners
2/005	Establishment of scientific and professional collaborations between the Gibraltar Museum and international institutions	4,5,8	14	Partnerships exist and others are actively sought where mutual co-operation and benefit is likely.	On-going	Director WHS

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
2/006	Stimulation of further work on collections by PhD and post-doctoral students	3, 4, 5, 8	12,	Currently two PhD theses on material from the caves are being conducted, at Oxford and Anglia Ruskin Universities. The museum currently has a post-doctoral researcher working on taphonomy of small game.	On-going	Director WHS
2/007	Review partnerships	1, 3, 8	14		On-going	Director WHS
2/008	Calpe Conference on the Neanderthals 2017	1, 3, 5, 8	16, 28	The Gibraltar Museum has organised three major international (Calpe) conferences on the subject of the Neanderthals and aims at organising one every three years. A conference entitled "In the 2/009 footsteps of the ancestors: a universal heritage of everyone" was held in September 2014.	September 2017	Director WHS

Principal Policy Objective 3: to promote awareness and understanding of the site's Outstanding Universal Value

3/001	Information at viewing platforms and other key sites on the nomination and on UNESCO	3, 4, 5, 6, 7, 8	17, 22		June 2015	WH Team
3/002	Regular articles and features are published in local news media and interviews are given to local radio and television	1-8	18	List to be included in management database.	On-going	Director and WH Coordinator
3/003	The Gibraltar Museum organises an annual programme of public lectures	3, 4, 5, 6, 7, 8	28	This is free and open to locals and visitors and is well attended.	On-going	Gibraltar Museum

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
3/004	The Gibraltar Museum makes use of digital, including social, media to inform and discuss work at the caves with a wide audience	1, 3, 4, 5, 7, 8	18	The use of media and ways of digitally opening up the site is expected to intensify.	On-going	Museum Web master
3/005	The Gibraltar Museum is a member of the Ice Age Europe Project and hosted the annual meeting.	1, 2, 8	14, 27	This meeting was held in October 2014. Inter-active screen installed as part of network, in Museum.	Completed.	WH Coordinator
Principal Policy Objective 4: to welcome local people and visitors to the site at levels which it can sustain						
4/001	Visitor Management Plan	1, 2, 4-8	20-26		May 2015	WH Team
4/002	Production information leaflets/ for general, Gibraltar wide distribution at key visitor points		16, 17, 22		July 2015	WH Team
4/003	Making safe areas of open public access	1, 3, 5, 8	22, 26	Provision of wood and rope barriers in certain places on Mediterranean Steps.	On-going	Technical Services Dept.
4/004	Provision of interpretation panels within the site	1, 3-8	16, 17	To be incorporated into an on-going programme of interpretation of the Gibraltar Nature Reserve.	July 2015	WH Team; Environment Dept.
4/005	Opening up of viewing platforms at 1st, 2nd and 3rd Europa Advance Batteries	3-8	16, 17, 20-22	Includes removal extraneous fixtures, repairs, provision basic facilities in keeping with nominated property and historic military setting.	July 2015	WH Team
4/006	Provision of Interpretation Centre at Parson's Lodge to include open air displays	1, 3, 5, 6, 7, 8	16, 17, 20-22	Building surveys commenced December 2014.	July 2015	WH Team
4/007	Development of land and sea tour options	1, 3, 5, 6, 7, 8	16, 17, 20-22	Part of business planning.	On-going	WH Team

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
4/008	Enhancement of displays, information and material from the caves in The Gibraltar Museum	1, 2, 3, 5, 6, 8	16, 17, 20-22	Displays of Neanderthals and the site exist today in the Gibraltar Museum. Expansion of the museum Neanderthal displays will be done once the new administrative facilities open in the Moorish Castle complex, releasing space in the Gibraltar Museum.	On-going	Gibraltar Museum
4/009	Monitoring of visitor impact	1, 3, 6, 8	23	The collection of trial sample baseline data commenced on 1 July, 2014.	Stage 1 Completed. On-going	WH Team
4/010	Visitor survey	1, 3, 6, 8	20-22		Summer 2014, summer 2015 and ongoing	WH Team
Principal Policy Objective 5: to provide a high quality range of educational information and services about the site						
5/001	The Gibraltar Museum currently sponsors a prehistory programme for all first schools in Gibraltar	1, 3, 4, 8	27		On-going	Education Officers and WH Team
5/002	Review range of educational material, revise and update and diversify as needed	1, 3, 4, 8	27	Include greater number programmes for access for all abilities, using all media and techniques.	April 2015	Education Officers and WH Team
5/003	Review potential for expanding schools' curricula to include courses based around WH at all levels	1, 3, 4, 8	27			Education Officers and WH Team; Education Dept.
5/004	Upgrade web site	1, 3, 4, 5, 7, 8	16, 18, 27		April 2015	Web master, WH Team

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
5/005	Collaboration with local groups in relation to expertise and information sharing	1, 3, 4, 6, 8	14		On-going	Education officers and WH Coordinator
Principal Policy Objective 6: to ensure that World Heritage Site status assists wider sustainable development objectives within Gibraltar						
6/001	The Gibraltar Museum makes an active contribution heritage-led regeneration in Gibraltar: develop revised strategy	1, 3, 4, 8	29-31	This focus is expected to intensify with particular emphasis on the WHS.	May 2015; on-going	WH Team; Town Planner; GHT
6/002	The Gibraltar Museum makes a contribution to the tourism product	1, 4	29-31	This focus is expected to intensify with particular emphasis on the WHS and the opening of new displays.	On-going	Gibraltar Museum; WH Team; Tourism Dept.
6/003	Development of staff via external training programmes	1-8	29-31	Has commenced with the appointment of new staff.	On-going	Gibraltar Museum
6/004	Strategy for developing links with Gibraltar University and other key partners to provide services	1-8	29-31		March 2015	WH Team
6/005	Strategy for developing links with UK and Overseas Territories partners to provide services	1-8	29-31		March 2015	WH Team
6/006	Assess impact of WH status on visitor spending	1-8	30	Need to develop methodology in discussion with HMGoG Statistics and other departments.	2016	WH Team; HMGoG departments
Principal Policy Objective 7: to promote and support the aspirations of UNESCO in sustainable development, inter-cultural dialogue and the relief of poverty						
7/001	Capacity-building programme for developing countries	1-8	34		2017	Director WHS and WH Coordinator

Gibraltar Neanderthals

ID number	Action	Subsidiary Policy Objectives	Indicator (Table 22)	Remarks	Expected Completion Date	Lead body
7/002	Build links with Overseas Territories WHS, explore options for providing assistance	1-8	35		2016	WH Team
7/003	Review potential for including in schools programmes	1-8	36		2016	WH Team
7/004	Review existing UNESCO-related programmes in Gibraltar and ensure effective partnership approach	1-8	35, 36	Review to include initiatives eg local Education for Sustainable Development.	2015	WH Team
7/005	Participation in World Heritage Youth Forum	1-8	36		2016	WH Team
7/006	Celebrate WH Day and other UNESCO events	1-8	36		2016	WH Team
Principal Policy Objective 8: to be an exemplary model for World Heritage Site Management						
8/001	Development of in-house training programmes for staff	1-8	37	On-going but will intensify, with induction for new staff.	On-going	Director WHS and Coordinator
8/002	Strategic Environmental Assessment for project	1-8	41	In line with HMGoG practice.	March 2015	WH Team; Environment Dept. and Town Planner
8/003	Development of integrated records database	1-8	1	GIS-based database incorporating all cultural and natural heritage assets, designations, condition surveys etc.	June 2015	WH Team and Museum Collections Manager
8/004	Develop WH branding including explanatory UNESCO information	1-8	36	Include in Visitor Management Plan.	April 2-15	WH Team
8/005	Review Risk Plans at least annually	1-8	43		On-going	WH Team
8/006	Property Business Plan	1-8	38	Drafting to commence 2015, with view to implementation from July 2016.	July 2016	Director WHS

22. Monitoring effectiveness

The following table sets down the proposed indicators and measures that will be used to monitor the effectiveness of the Plan’s implementation. The periodicity of review and reporting is linked to internal management and also to the requirements of periodic reporting to UNESCO World Heritage Centre. Even so, monitoring of deposits as part of the research and conservation strategy will ensure that the state of conservation of the caves is maintained.

The indicators are arranged by Policy Objectives (PO).

Indicators aimed at safeguarding the Site’s Outstanding Universal Value (PO1).			
Indicator	Measurement Method	Periodicity	Location
1 Heritage database and archive (including archaeological deposits)	Database and archive maintained by Museum, increasing public access, to include: <ul style="list-style-type: none"> • inspection of storage and condition of artefacts and specimens recovered (monthly) • Visual and photographic survey of deposits in caves (monthly) • Visual and photographic survey of archaeological deposits in caves during excavations (daily during excavations) 	Monthly Every 5 years, review	Gibraltar Museum
2 List and number of species, protected and not (flora, fauna and birds)	Ecological surveys listing and mapping priority species and habitats identified in the Nature Reserve Implementation Plan. Annual bird, reptile, faunal and floral surveys. To include: <ul style="list-style-type: none"> • Visual and photographic survey invasive plant species within property to measure success of removal • Visual and photographic survey plant repopulation project to measure success of new planting • Census breeding bird species within property (monthly March - May) • Bird migration counts (daily) • Census of wintering Crag Martin roost in Gorham’s and Vanguard Caves (weekly October to March) • Census of bat populations in caves within property (monthly) • Survey of plants (annually) • Survey of invertebrate fauna (quarterly) • Survey of intertidal molluscs within the property (annually) • Monitoring of EU-protected species and habitats 	Annual surveys; full report every five years	Gibraltar Museum, Gibraltar Botanic Gardens, GONHS, Dept. of Environment
3 Map extent of protected habitats	Use digital mapping to keep up to date and review.	Annual surveys; full report every five years	Gibraltar Museum, Gibraltar Botanic Gardens, GONHS

Gibraltar Neanderthals

4 Map extent of geological formations	Periodic surveys and publications.	Review every 5 years	Gibraltar Museum
5 List and number of features at risk within the WHS	<p>Condition survey of key attributes of Outstanding Universal Value including fixed-point photography and text report. Particular emphasis on caves with archaeological deposits at sea level and high level. To include:</p> <ul style="list-style-type: none"> • Photographic survey condition of cliffs and dunes and key attributes within property (annually) • Photographic Survey of general condition of area between key attributes (annually) • Weekly visual survey property boundary to ensure no encroachment • Annual photographic survey property boundary • Visual and photographic survey cave deposits to check for erosion and graffiti (monthly) • Visual and photographic survey of rock art to check for damage (annually) • Visual and photographic record of cave deposits during archaeological excavations • Visual and photographic survey of interpretation panels (biannually) • Visual inspection, measurement and photographic monitoring of lichen growth on rocks as indicator of air pollution (annually) • Development of indicator(s) for volume of deposits excavated during 5-year period <p>Report includes urgent and longer-term recommendations, and any improvements. Based on Museum Heritage Database, carried out by WHS Team assisted by volunteers from GHT and GONHS. Carried out in conjunction with measure 23 as far as practicable.</p>	Annual survey and report; review trends every 5 years	Gibraltar Museum
6 Quality of environment	<p>Annual photographic survey of setting and key features. Text report identifying landscape character, changes and enhancement with recommendations for the short, medium and long term. Also wider environmental reports including:</p> <ul style="list-style-type: none"> • Monitoring of air quality (monthly; by Environment Dept.) • Monitoring of water quality (weekly; by Environment Dept.) 	Weekly, Monthly, Annual report, full assessment every 5 years	Gibraltar Museum

7 List of major physical changes within the WHS & record of any loss, based on measures 2, 5 and 8	Include in Annual Report on WHS.	Annual report	Gibraltar Museum
8 List of Conservation Measures	Report by WHS Coordinator, summarising all actions (e.g. clearance debris, rehabilitation/re-planting scheme, stabilisation measures, any grants schemes including value).	Annual report	Gibraltar Museum
9 Designations within WHS and buffer zone	Periodic review to include % of the WHS and buffer zone protected by designations, including Nature Reserve, Heritage Act, international designations, number scheduled monuments and number of listed buildings.	Review every 5 years	Gibraltar Museum
10 List of developments within the WHS or in the buffer zone affecting OUV, including setting	Monitor all planning applications, annual report Town Planner and Gibraltar Heritage Trust (GHT), coordinated by WHS Director. Although highly unlikely to occur, the WH Committee will be informed, through the Secretariat, of any proposed major restorations or new constructions which may affect OUV (Paragraph 172 notifications).	Annual report	Gibraltar Museum
11 Existence of WHS Policy and Planning Guidance in the Local Development Framework.	Presence/absence: Gibraltar Development Plan to include strategic principles, policies and design guide. Development Plan adopted as legal instrument. Planning guidance for development affecting the WHS or its setting within Gibraltar Development Plan. Although highly unlikely to occur, the WH Committee will be informed, through the Secretariat, of any proposed major restorations or new constructions which may affect OUV (Paragraph 172 notifications).	Review every 5 years	Gibraltar Museum
Indicators aimed at monitoring the fostering of the gathering and dissemination of scientific information about the Site (PO2).			
12 Research strategy	Research strategy in place, monitored by International Research and Conservation Committee at its annual meeting. Particular attention to balancing conservation needs with research objectives.	Annually or as needed	Gibraltar Museum
13 Fieldwork and surveys	Fieldwork and surveys guided by research strategy, and each has specific research questions. Annual review of all fieldwork to ensure sound balance between investigation and research outcomes, research projects, surveys and publications highlighting any new information about the World Heritage Site.	Annually	Gibraltar Museum
14 Partnership working	Assessment and monitoring of team composition to ensure sound mix and appropriate skills and experience.	Annually	Gibraltar Museum

15 Publication Records	List of all academic publications by year.	Every five years	Gibraltar Museum
Indicators aimed at monitoring the promotion of awareness and understanding of the Site's OUV (PO3).			
16 Provision for outreach, access and interpretation	Baseline annual summary of provision for interpretation and access, including provision for visitors with disabilities, virtual access, children, and foreign visitors. Annual review to identify changes and improvements (new view points, new information boards, new website, new discoveries etc.).	Annual report	Gibraltar Museum
17 Quality of interpretation about the values of the WHS and UNESCO aspirations	Annual visitor surveys to assess on-site interpretation on WH and UNESCO. Including ease of access and location, quality of information, standard of presentation. Peer review to assess on-site and off-site interpretation explaining the values of the WHS, based on standard checklist (use of WHS plaque, WHS road and gateway signs, information at airport, website, Museum, Castle Field Centre, Parson's Lodge, tourist offices, key visitation points such as Jews' Gate, Europa Point, popular and academic publications.	Annually Every 5 years	Gibraltar Museum
18 Number of hits on web site and visitors/ members of social media pages	Monitor through standard packages.	Annual report	Gibraltar Museum
19 Media coverage	Number of popular articles, newspaper articles, TV documentaries and radio programmes on the WHS.	Annual report	Gibraltar Museum
Indicators aimed at monitoring the entry of local people and visitors to the Site at levels which it can sustain (PO4).			
20 Number of visitors to the WHS	Ticket count for paying sites at key locations of Jews' Gate, Museum and Parson's Lodge, complemented by visitor surveys and questionnaires. Use of people counters will be explored. Five yearly review of statistics and comparison with other WHS.	Annual report, with review and assessment every 5 years	Gibraltar Museum and Gibraltar Tourist Board
21 Profile of visitors	Visitor surveys (on-going), covering % of local visitors, education visitors, % of foreign visitors with nationality split, % of groups, % of repeat visitors, age split and social diversity.	Annual report, with review and assessment every 5 years	Gibraltar Museum and Gibraltar Tourist Board

22 Level of satisfaction	Visitor surveys and questionnaire rating their visit (1= very poor, 2= poor, 3= satisfactory, 4= good, 5= very good).	Annual report, with review and assessment every 5 years	Gibraltar Museum and Gibraltar Tourist Board
23 Physical impact of visitors	List of negative physical impacts and remedial measures recommended (e.g. erosion of Mediterranean Steps and Upper Rock paths and roads, impacts on plant life). Weekly inspection for litter; Quarterly monitoring by visual inspection and fixed-point photographic survey. WHS Team and Volunteers	Annual Report; full assessment report every 5 years	Gibraltar Museum
24 Site visits to sea caves	Number of visits and visitors per visit. Gorham’s Cave Complex can only be visited by prior arrangement and in limited numbers, with authority from the WHS Director. Records of visits are kept by the Museum. Most visits are by sea; land access is restricted.	Variable, but at least 20 per year	Gibraltar Museum
25 Guided visits to Upper Rock sites, including Mediterranean Steps	Numbers of tours, numbers in tour parties and profiles. Records of all parties visiting are kept; risk assessments are undertaken, and briefings for staff and students and visitors.	Annual Report; full report every 5 years	Gibraltar Museum
26 No reportable accidents or incidents	Risk assessments and safety briefings are made, including fitness levels; records of parties and individuals kept.		Gibraltar Museum
Indicators to monitor the provision of a high quality range of educational information and services about the Site (PO5).			
27 Educational resources and activities, including outreach and publications	Availability and quality of resources: feedback from teachers and consumers through customer questionnaires. There is a range of educational resources and activities available, run from the Museum. These include teachers’ packs, website, an education officer, activities on site, in the Museum, in schools, etc.). Activities are guided by input from teaching staff on suitability to key stage curricula.	Annual review	Gibraltar Museum
28 Conferences and Lectures	The Calpe Conference. WHS and Museum Staff regularly give local and international lectures on the WHS, human evolution and associated subjects. Records of lectures and talks are kept by the Museum and reported annually.	Major conference every 3 years; annual summary of activities; review every 5 years	Gibraltar Museum

Indicators to monitor that World Heritage Site status assists wider sustainable development objectives within Gibraltar (PO6).			
29 Economic and social impact of WHS status	Assessment is based on economic surveys, resident surveys, focus groups, and HMGoG covering any relevant issues. These include the impact of tourism, quality of life, funding received, buildings re-use, skills, business and residential property value, number of new businesses, etc.	Every 5 years	HMGoG Office of Statistics and Gibraltar Museum
30 Visitor spending	HMGoG provides annual visitor expenditure estimates, which are published on the HMGoG web site. This includes the average spend by nationals, the number of day trips, and average spend by foreign visitors and the number of overnight stays. Future surveys will include as assessment of the impact of WHS.	Annual	HMGoG Office of Statistics
31 Number of jobs generated and sustained	Regular monitoring of the number of staff directly employed by the WHS and other indirectly-employed staff.	Annual	HMGoG Office of Statistics and Gibraltar Museum
32 Environmental policy	There is an HMGoG policy to improve the environment generally and 'green' Gibraltar. The policy includes targets for reducing carbon footprint, energy and water consumption, reducing and recycling waste and improving waste management facilities, environmental guidelines for new buildings and visitor facilities. The policy is monitored by the Department of the Environment.	Annual	Department of the Environment
33 Percentage of visitors arriving or travelling within the WHS by different means	Visitor survey and monitoring is undertaken at key points including Jews' Gate. Travel within the WHS has to be largely on foot.	Annual	HMGoG Office of Statistics, Gibraltar Tourist Board and Gibraltar Museum
Indicators to monitor the promotion and support of the aspirations of UNESCO in sustainable development, inter-cultural dialogue and the relief of poverty (PO7).			
34 Capacity-building	Number of capacity-building and training activities, numbers students, trainees and volunteers attending. Number of links with other WHS in developing countries; number activities and numbers attending. Number of capacity-building and training courses for rehabilitation and recovery.	Annual report; review every 5 years	Gibraltar Museum

35 Partnership working	Composition of archaeological, science & conservation teams; type and number of publications with multi-national or multi-organisational authors; number local community groups and businesses participating in delivery of Management Plan objectives.	Annual report; review every 5 years	Gibraltar Museum
36 Raised awareness of UNESCO aspirations and functions	Regular surveys of levels of awareness in local population and among visitors; surveys school activities; promotion of World Heritage Convention in particular and World Heritage Sites; participation in World Heritage Youth Forum; celebration WH Day and other UNESCO events.	Annual report; review every 5 years	Gibraltar Museum
Indicators to monitor making the site an exemplary model for World Heritage Site Management (PO8).			
37 Training	Number of courses and numbers attending; attendee feedback	Annual report; review every 5 years	Gibraltar Museum
38 Government commitment through funding	Level of funding maintained or enhanced annually	Annual review	Gibraltar Museum
39 Community involvement	Numbers of local people and businesses participating in protection measures, interpretation and visitation activities, responding to consultations; numbers visiting WHS; increased awareness values of WHS.	Annual report; review every 5 years	Gibraltar Museum
40 Existence of WHS Management Plan	Management Plan for 2014-2019 in place	Review every 5 years	Gibraltar Museum
41 Steering Group	Advisory Forum with representatives all stakeholders in place; chaired by Deputy Chief Minister	Meets annually; review every 5 years	Gibraltar Museum
42 WHS Director & Coordinator and WHS Team	WHS Team of 15.	Review annually	Gibraltar Museum
43 Risk assessment and emergency plans	Risk assessments for all activities, emergency plans in place for natural and man-made disasters. Efficacy of emergency procedures tested annually.	Review annually	Gibraltar Museum

Appendix 1: Draft statement of Outstanding Universal Value: core statement for future monitoring

a) Brief Synthesis

The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and 46 caves on the east side of the Rock of Gibraltar bordering the Mediterranean Sea. Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea-level rise and fall, some caves now being partly submerged and others offshore lying in the sea bed. Exceptionally, given the abrupt relief, some caves - most notably Gorham's and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years. Four caves have archaeological evidence of Neanderthal occupation and four of the first modern humans. They have generated a large body of information on the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique examples of the exploitation of birds and marine mammals for food. Gorham's and Vanguard Caves have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. The caves have been excavated systematically over 25 years but vast deposits remain intact, retaining huge potential.

Lush Mediterranean vegetation and intertidal animals - species known to have predominated at the time of the Neanderthals - continue to cover the cliffs, slopes and rocky beaches. Resident birds, present when the Neanderthals lived here, still breed within the site while many migratory species rest or fly over the site during their annual migrations between Europe and Africa. Put together, all these elements offer the most complete picture of the Neanderthal world anywhere. Importantly, there are significant components surviving to the present which provide a unique opportunity to study and interpret the Neanderthal way of life in a natural context. The subsequent presence of early modern humans offers an excellent opportunity to compare the lifestyles of two human lineages within the same eco-geographical context, a comparison that is revealing great similarities between the two lineages and that is changing our view of the abilities of the Neanderthals. This extraordinary combination provides an exceptional and vivid picture of the Neanderthals, their way of life and environment, and gives the property its Outstanding Universal Value.

b) Justification for Criteria

Criterion (iii): The site provides an exceptional testimony to the Neanderthals, a people and their cultural traditions, who are now extinct. Rock engravings, stone tools, hearths, bones with cut marks and evidence of burning, and molluscs showing fracture marks made with stone tools are the primary evidence of the Neanderthals. A rich array of fossil vertebrates (including the highest avian species diversity of any site), molluscs, pollen and charcoal provide the climatic and ecological context for Neanderthal and subsequent early modern human occupation. The enormous depth of archaeological and palaeontological deposits in Gorham's and Vanguard Caves spans 125,000 years. An outstanding high-resolution record thus allows comparisons across a huge time span and permits analysis of stasis and change in cultural traditions. The quality of resolution allows understanding of the daily activities of the Neanderthals, including their capacities for abstract thinking. The spatial distribution of sites permits a detailed understanding of how the Neanderthals exploited their territory. The present environments of the site contain plants and bird species which shed light on this lifestyle. Our knowledge of the abilities and cultural traditions of the Neanderthals has changed decisively as a direct consequence of the evidence provided by this incomparable site.

Criterion (v): The site is of Outstanding Universal Value because its topography, geological features, natural cliff vegetation and rocky shoreline communities, afford a clear vision of a place which was once home to the Neanderthals. Nowhere is the relationship of the Neanderthals and their environment more palpable than it is in this site. It offers important features that allow us to understand and interpret the traditional lifestyle of the Neanderthals in their environment, and also to compare it to that of early modern humans. Part of this landscape was subjected to irreversible change with sea level rise 10,000 years ago; ancient raised beaches, scree slopes, shorelines and dunes within the site are reminders of the dynamic and precarious nature of a coastal world that was in a constant state of flux. The evidence in the caves enables us to understand how Neanderthals and modern humans adapted to these changes, varying their subsistence strategies as opportunities arose. The incomparable topography of the Rock of Gibraltar, as well as its modern-day flora and fauna, with many species still present from ancient times, opens up an exclusive window into the lost world of the Neanderthals.

c) Statement of Integrity

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The boundaries follow natural topographical features that incorporate the complete series of attributes that gives the site Outstanding Universal Value. The geological and archaeological attributes are exceptionally well-preserved while a significant proportion of the flora and fauna present in the Palaeolithic is still present today. In addition to their intactness, the attributes have a clear coherence within the boundaries of the property. The inclusion of a significant area surrounding the caves makes it possible to understand more fully the ways in which the Neanderthals interacted with their surroundings; it also guarantees that the nominated property is of adequate size to ensure the complete representation of the features and processes that convey its significance. Risks affecting the property are largely related to long-term climate change and sea level rise; shorter term risks with natural fires and rock falls; they are considered to be low and are closely monitored. The attributes are not threatened by development, deterioration or neglect. A combination of legal protection, active management, vertical scale and topography minimises risk to the property, which can only be appreciated if its dynamic character is fully understood.

d) Statement of Authenticity

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning. These attributes fall into three distinct categories: 1) the stratified deposits within the caves which contain a wealth of information that situates the site in a time framework are wholly authentic in material and substance. They contain engravings, artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first modern humans. 2) the form and substance of the caves themselves, their location and setting, the surrounding cliffs, their geological formations and the tangible evidence of climate and sea-level change (ancient beach levels); and 3) well-preserved relict cliff vegetation and faunal elements that have a direct connection with the vegetation that grew on these cliffs when Neanderthals and modern humans lived in the caves.

e) Requirements for Protection and Management

Ownership of the site rests with Her Majesty's Government of Gibraltar which has appointed the Gibraltar Museum, through its Director, as manager. A small section of the site is owned by the UK Ministry of Defence. All the key attributes of OUV are entirely situated within HMGoG-owned (non-leased out) land. The site has full legal protection as part of the Gibraltar Nature Reserve; individual caves are also Schedule 1 Category A (maximum protection) sites under the Gibraltar Heritage Trust Act. Additional protection is provided by the Town Planning Act. Access to fragile caves is strictly controlled, permitted only with a guide approved by the Gibraltar Museum Director. The Mediterranean Steps are open to the public and are maintained with interpretation; the relict vegetation along the cliff walk is not threatened. Wildlife is protected through the Gibraltar Nature Reserve Act. Visitor numbers to sensitive parts of the site are and will be restricted and closely-monitored. Systems of access control will be updated as technology improves. Archaeological excavations are managed to ensure no loss of site integrity. An international

committee of experts reviews relevant plans from the perspective of conservation, maintenance of site integrity and academic standards.

A Steering Committee is guiding the process of nomination; this Committee will become an Advisory Forum if the property is inscribed. Non-governmental organisations (Gibraltar Ornithological and Natural History Society; Gibraltar Heritage Trust) with site interests are directly involved in management processes. A dedicated multi-disciplinary team based at the Museum is implementing the Management Plan. Levels of resourcing, including staff levels, are reviewed annually. There will be a five-year review of the management plan and systems, legal protection and research strategies, with annual monitoring and reporting. Particular emphasis is given to risk management and to improving visitation opportunities. The general public is kept informed of work undertaken through regular lectures, press, television and social media and direct participation.

Appendix 2: Risk preparedness plan

Executive Summary

The purpose of this plan is to reduce the risks to the nominated property and its ecosystems from natural and human made hazards and disasters. It reviews major risks and potential disasters posed both to people and to the physical attributes that carry the heritage values of the property – its Outstanding Universal Value (OUV), and sets out mitigation measures. The Plan covers the nominated property, its buffer zone and associative attributes including Museum Collections, and is reviewed annually or after any major incident.

The principal reason for this Plan is to ensure that the nominated property is incorporated into existing risk preparedness and disaster management schemes. It consolidates in one place those risks identified as particular to the property and its associated attributes, so that they are taken into account in the national plans. Responsibility for maintaining and updating local plans, for implementation of any mitigation or recovery remains with the relevant HMGoG department. Responsibility for liaison and training in WHS-related matters rests with the WHS Coordinator. A small management team comprising the WHS Coordinator, and representatives from: the Technical Services Department, the Environment Department, the Town Planning Department, the City Fire Brigade, the Royal Gibraltar Police and the UK Ministry of Defence, monitors the Plan. The WH Executive Management Group will oversee implementation.

The level of risk is 'scored' as the probability of the hazard occurring (very unlikely, score 1 to certain, score 5) multiplied by the potential severity of the occurrence (negligible, score 1 to catastrophic, score 5).

We define as **very high risk** (score 20-25) in cases where there is a significant risk to life or where irreparable damage may be caused to the attributes of OUV, with potential destruction of the property. Our analysis indicates that no aspect of the site is at very high risk.

High risk (score 13-19) is defined as potential risk to life; major damage to attributes of OUV, possibly some irrecoverable. The most detrimental potential effect is the long-term high risk of sea level rise. Measures to ensure the long term safety of key features – marine protection of the Gorham's Cave Complex – are being considered. There is no immediate risk.

Medium risk (score 7-12) is defined as having a low risk to life; posing a degree of risk to attributes of OUV, but damage recoverable and attributes not destroyed. The medium risks identified relate to rock falls and other erosion, pollution and fire. Rock falls are likely, particularly after periods of heavy rain, because of the nature of the geology and topography in a dynamic environment. Though variable in scale, rock falls potentially pose a risk to people and to the heritage assets including the attributes of OUV. Within the nominated property, there are areas along the top

ridge where the rock has fractured; and there is a risk of rock falls around the Monkey's Cave Convalescent Hospital area above the Gorham's Cave Complex. Safety measures include removal of loose rock and replacement of existing netting. Restrictions are in place on visits to Gorham's Cave Complex by land, as there is a high likelihood of rock falls affecting the access steps at particular times of year and in specific weather conditions. Most visits will be made by sea (including those related to major, annual, archaeological works); the steps will be used mainly as a means of emergency egress. Within the buffer zone, the stretch covering the Catalan Bay Sand Dune has been the area to suffer the majority of rock falls in recent history. Rock fall defences erected on the sand slopes afford protection.

Low risk (score 1-6) is defined as having no risk to life, and posing possible negligible or minor damage to attributes of OUV but repairable.

The Technical Services Department has a programme of probability analyses to underpin its regular safety and prevention measures. There is a monitoring programme in place and detailed surveys are undertaken as needed. Cliff stabilisation measures, including clearance of loose rock, fenced safety zones, netting, and rock bolts, have been undertaken above Gorham's Cave Complex and this will continue here and elsewhere. But within the nominated property the safety measures will be designed in such a way that the visual significance and vistas are not adversely affected by intrusive safety measures. The natural erosion will be allowed to continue, as long as there is no significant risk to life.

There are safety issues in parts of the Mediterranean Steps where there are near vertical cliffs immediately adjacent to the paths. These are potentially a high risk to pedestrians. Safety fences and wooden sleeper barriers are in place and maintained, and require frequent checking and replacement.

Vegetated areas become extremely dry during the summer months, and the abundance of dry vegetation during this period makes fires a very definite risk especially between late May and late October, especially on the west side Upper Rock sector of the Gibraltar Nature Reserve. Residents, visitors, flora, fauna and attributes carrying OUV are at risk. There are firebreaks in place, and regular inspections of equipment and water supplies. The City Fire Brigade has well-established contingency plans. Additional signage information will be implemented along with an educational programme for visitors and locals.

Litter is a constant problem requiring regular clearance and cleaning and a substantial investment in resources. Pollution by litter can cause damage to flora and fauna, damage to visitor experience and perceptions and also the degradation of heritage assets. It also has the potential to aggravate or increase the risk of fire. Within the nominated property, the problems are worst along the sea cliffs on Europa Advance Road where interpretation and viewing platforms are proposed for completion in 2015. This issue will be ameliorated by the removal of refuse stored in a quarry along this road, of the recycling facilities and the clay pigeon shooting site on the Third Europa Advance Battery. The Mediterranean Steps suffer from litter to a lesser extent, but clearance is more difficult and needs to be carried out on a more regular basis in the high season for visitors. Signage encourages visitors to use bins supplied. Nevertheless there is a need to improve the education of all visitors, local and tourists, about the problems caused.

Vandalism mainly in the form of spray-painted graffiti or through disturbance of bat and bird roosts is a medium risk to heritage assets, including the higher level and accessible caves (Goat's Hair Twin Caves in particular). Military heritage assets are also regular targets for graffiti, often chosen for their visible locations. A programme of removal of graffiti is being implemented for Goat's Hair Twin Caves by the Gibraltar Museum. Other graffiti are dealt with as needed by the Environment Department. Vandalism also impacts on infrastructure and signage. Regular monitoring and a programme of education are in place to try and prevent substantial damage. Risk is lower to the major caves as a result of strict controls on access.

There is a medium risk that there could be pollution from oil spills from ships in the Mediterranean affecting the intertidal communities at Gorham's Caves Complex. The likelihood is probably low, as there have been no recorded incidents in the last 10 years and protection is in place through the designations. However, it remains a possibility which would have a severe adverse effect on one of the heritage attributes carrying the property's OUV. The Environment and Port Departments have contingency plans for such risks, and shipping is monitored regularly.

There is a substantial amount of traffic in the Upper Rock sector Nature Reserve (buffer zone, west side) which potentially puts flora and fauna at risk from pollution, as well as having an adverse effect on pedestrians and the visitor experience generally. The nominated property itself has a low risk from vehicle pollution, but could be affected by the risk to the reservoir of flora and fauna elsewhere on the Upper Rock. This risk is considered to be very low. Traffic access is controlled at night, but during the high season access for tour companies and taxis is not restricted and there are times when the Upper Rock becomes saturated with traffic queuing. There is an element of control of private visitors by car during the peak season. A revision of the Upper Rock Management Plan is currently being undertaken by the Department of the Environment.

The nominated property itself is not physically at risk from development and is protected by the Nature Acts (1991 and related statutes) and by the Gibraltar Development Plan (2009, as amended). Any proposals would have to be accompanied by a heritage impact assessment (ICOMOS 2010), and on occasion a full environmental impact assessment.

However, in a democratic planning system the possibility remains that development causing damage to key views of the site, and therefore damage to OUV, to interpretation and understanding, might be approved either on application or on appeal. This would have a serious detrimental effect on the property and its values but is considered highly unlikely.

The implementation of planning procedures is overseen by the Town Planner, who also chairs the Development Planning Commission. The Gibraltar Heritage Trust, the Gibraltar Museum, and the Ministries of Environment and Heritage are consulted over all applications. A programme of public information and education about the importance of the property and the requirements for its safeguarding has been implemented.

The following table summarises the risks by attribute carrying OUV and for the buffer zone.

Attribute or Area	Low Risk	Medium Risk	High Risk	Very High Risk
Attributes of OUV				
a) Gorham’s and Vanguard Caves Neanderthal occupation; Bennett’s and Hyaena Caves	Rock fall Erosion (natural) Explosion Vandalism	Erosion (human made)	Sea level rise (long term)	
b) Gorham’s Cave evidence of the first modern humans in the area.	Rock fall Erosion (natural) Explosion Vandalism	Erosion (human made)	Sea level rise (long term)	
c) The 426-metre high Jurassic limestone cliffs	Erosion Pollution - litter	Rock fall Fire (natural eg lightning) Fire (human induced)		
d) Pollen and charcoal evidence from Gorham’s and Vanguard Caves	Erosion (natural) Explosion Vandalism	Erosion (human made)	Sea level rise (long term)	
e) Recurring presence today of large numbers of birds, cetaceans, fish and bats - a uniquely substantial proportion of the fauna that existed at the time of the Neanderthals remains observable today as are some ecological processes.		Fire Pollution (litter) Pollution (traffic) Vandalism Pollution – Oil spill		
f) A well-preserved intertidal community of organisms on the rocky beach by Gorham’s and Vanguard Caves	Vandalism Sea level rise (long term)	Pollution - oil spill		
Associative Attributes of OUV				
g) Submerged landscape features; and a massive fossil sand dune – the Catalan Bay Sand Dune	Pollution Ship wreck Erosion (natural) Erosion (human made) Pollution - litter	Rock fall		
h) The rich collections of artefacts and fossils excavated over the past 25 years as well as material from earlier excavations	Fire Storage conditions Theft Vandalism			
Specific parts of candidate property				
Europa Advance Batteries Viewing Platforms	Pollution – litter Pollution – vehicle			
Mediterranean Steps	Rock Fall Erosion (natural) Pollution – litter	Erosion (human induced) Fire (natural) Fire (human induced)		

Gibraltar Neanderthals

Buffer Zone				
Nature Reserve - west side, east side, south side	Erosion (natural) Erosion (human induced) Inappropriate development	Rock fall Fire (natural) Fire (human induced) Pollution – litter Pollution – vehicle		
Buffer Zone (Europa Advance Road)	Pollution – litter Pollution – vehicle Inappropriate development			

1 Purpose

- 1.1 The purpose of this plan is to reduce the risks to the nominated property and its ecosystems from natural and human made hazards and disasters.
- 1.2 This Plan covers major risks and potential disasters posed both to people and to the physical attributes that carry the heritage values of the property – its Outstanding Universal Value (OUV). Disasters pose risks to the lives of visitors, staff and local communities living on the site or in neighbouring areas, and also to important associative museum collections and documents. They can also have negative consequences for the local economy due to the loss of tourism revenues, and for the livelihoods of local people who may be dependent on the nominated property.
- 1.3 The principal reason for this Plan is to ensure that the candidate property is incorporated into existing risk preparedness and disaster management schemes, and that key factors are understood in the general management of risk in Gibraltar.
- 1.4 HM Government of Gibraltar (HMGoG) and other relevant organisations have in place a series of risk-preparedness plans for natural and human made disasters. This plan for the property does not replace existing plans, but consolidates in one place those risks identified as particular to the property and its associated attributes, so that they are taken into account in the national plans. The plan raises awareness of the specific issues within the local context and sets out a series of mitigation measures to reduce the risk of adverse incidents occurring.
- 1.5 The plan is primarily aimed at the property’s managers, management teams and the agencies and organisations that have a direct stake in the management of the nominated property.
- 1.6 The plan covers the nominated property, its buffer zone and associative attributes including museum collections.

2 Responsibility for the Plan

- 2.1 Responsibility for maintaining and updating local plans, for implementation of any mitigation or recovery remains with the relevant HMGoG department.
- 2.2 Responsibility for liaison with those departments and other relevant bodies such as the City Fire Brigade, Cave Rescue Team rests with the nominated World Heritage Site (WHS) Co-ordinator. The Emergency Disaster Committee is chaired by the Chief Minister.
- 2.3 The plan is overseen by a small management team comprising the WHS Co-ordinator, and representatives from the Technical Services Department, the Environment Department, the Town Planning Department, the City Fire Brigade, the Royal Gibraltar Police and the UK Ministry of Defence. This team reports, through the WHS Co-ordinator, to the property's Executive Management Group.
- 2.4 The Property Risk-Preparedness Plan will be reviewed annually, and also after any incident.

3 Existing Disaster and Risk Preparedness Plans (November 2014)

- 3.1 The following disaster management and risk preparedness plans are in place

Plan title	Coverage	Responsible Body
Major Incident Emergency Booklet	General advice to civil population	City Fire Brigade
Community Disaster Risk Plan		HMGoG Deputy Chief Minister's Office
Upper Rock Fire Disaster Plan	Fire in Nature Reserve	City Fire Brigade
Upper Rock Nature Reserve Management Action Plan	Management of Nature Reserve, including hazard and risk assessment (outline)	Gibraltar Ornithological & Natural History Society (GONHS)
Southern Waters of Gibraltar Management Scheme 2012	Marine environment	Environment Department
Management of Marine Living Resources in the Waters around Gibraltar	Marine life	Environment Department
Preliminary Flood Risk Assessment	Floods caused by natural agencies	Environment Department
Environmental Action and Management Plan	Natural Environment	Environment Department
Probability Analyses and emergency planning	Rock fall, erosion	Technical Services Department
Gibraltar Radiation Emergency Response Plan 2009	Radiation	City Fire Brigade
Disaster recovery and business continuity plan	IT, logistics and infrastructure	HMGoG IT & Logistics Section

4 The Nominated Property: Outstanding Universal Value and Attributes

- 4.1 The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and 46 caves on the east side of the Rock of Gibraltar bordering the Mediterranean Sea. Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea-level rise and fall, some caves now being partly submerged and others offshore lying in the sea bed. Exceptionally, given the abrupt relief, some caves – most notably Gorham’s and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years. Four caves have archaeological evidence of Neanderthal occupation and four of the first modern humans. They have generated a large body of information on the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique examples of the exploitation of birds and marine mammals for food. Gorham’s and Vanguard Caves have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. The caves have been excavated systematically over 25 years but vast deposits remain intact, retaining huge potential.

Lush Mediterranean vegetation and intertidal animals - species known to have predominated at the time of the Neanderthals - continue to cover the cliffs, slopes and rocky beaches. Resident birds, present when the Neanderthals lived here, still breed within the site while many migratory species rest or fly over the site during their annual migrations between Europe and Africa. Put together, all these elements offer the most complete picture of the Neanderthal world anywhere. Importantly, there are significant components surviving to the present which provide a unique opportunity to study and interpret the Neanderthal way of life in a natural context. The subsequent presence of early modern humans offers an excellent opportunity to compare the lifestyles of two human lineages within the same eco-geographical context, a comparison that is revealing great similarities between the two lineages and that is changing our view of the abilities of the Neanderthals. This extraordinary combination provides an exceptional and vivid picture of the Neanderthals, their way of life and environment, and gives the property its Outstanding Universal Value.

- 4.2 The following attributes give the site its OUV:

- a) Four caves – Gorham’s, Vanguard, Bennett’s and Hyaena - that were occupied by the Neanderthals between 127,000 and 32,000 years ago.
- b) Gorham’s Cave also provides complementary comparative evidence of the first modern humans in the area.
- c) The 426-metre high Jurassic limestone cliffs within the site provide a unique record of sea-level change over 3 million years
- d) Pollen and charcoal evidence from Gorham’s and Vanguard Caves - many of the plant species growing on the limestone cliffs and ledges today were also present when the Neanderthals lived on the Rock.
- e) Recurring presence today of large numbers of birds, cetaceans, fish and bats - a uniquely substantial proportion of the fauna that existed at the time of the Neanderthals remains observable today as are some ecological processes, especially connected with migration.
- f) A well-preserved intertidal community of organisms on the rocky beach by Gorham’s and Vanguard Caves - many species recorded inside the caves were consumed by Neanderthals and early modern humans during the Late Pleistocene

There are also attributes which do not form part of the property but which provide contextual information about location, setting, use and function of the site itself. These associative attributes therefore have a direct bearing on and support its outstanding universal value:

- (g) Submerged landscape features (including Flysch pinnacles associated with fresh water springs) and a large fossil sand dune – the Catalan Bay Sand Dune – which are relics of the Neanderthal landscape when sea levels were lower than today. These features have been modified to some degree by human activity, particularly in relation to the Second World War, but they are of sufficient contextual importance to be considered associative attributes.
- (h) The rich collections of artefacts and fossils excavated over the past 25 years as well as material from earlier excavations.

5 The Nominated Property's Condition and Vulnerability

5.1 The general state of conservation of the nominated property is good. The nominated property's heritage attributes, which give it its OUV, are in very good condition and maintain a natural coherence which has characterised them since the time of the Neanderthals. The caves, a major component, are well-preserved and the main archaeological and palaeontological ones retain vast deposits that constitute a reservoir of information for present and future generations of scientists. The Catalan Bay Sand Dune is virtually intact and only suffered minor loss during road construction and quarrying activities at the beginning of the 20th Century. The placement of a retention wall at the base of the sand dune, where it meets the road, at the beginning of the 21st Century has proved an effective conservation measure that has significantly reduced loss of sand during periods of heavy rain. The cliffs are in pristine condition and covered in rich growths of lichen which are indicators of clean air. The lush natural vegetation on these cliffs, which can be experienced at first hand in the Mediterranean Steps, is an excellent indicator of the environmental health of the property. Despite the high density of population in Gibraltar, the remoteness of the vertical cliffs has guaranteed their long-term survival, which is now enhanced by legal protection. This isolation has also allowed species of birds to live here, either to nest, roost or to refuel on migration.

5.2 The site has vulnerabilities. These include:

- (a) risk that future sea-level rise may affect the archaeological deposits at Vanguard and Gorham's Cave;
- (b) risk of oil spills at sea that could affect the rocky coastline and its intertidal community;
- (c) risk of summer fires on the vegetated areas of the site at a time (June-October) when there is intense heat and no rain;
- (d) erosion from rock falls, particularly after heavy winter rains, which is part of the dynamic nature of the system shaping the landscape;
- (e) potential development pressure along the periphery of the site, which could impact on the visual appreciation of the site;
- (f) risk of entry into caves and consequent inadvertent damage or vandalism, including graffiti. This risk is highest in the Goat's Hair Twin Caves, which are on the Mediterranean Steps and accessible to visitors; and
- (g) risk of persons arriving in boats and collecting molluscs from the rocky beach.

5.3 Overall, at present the site retains a coherence and integrity which permits a full understanding of its character both from land and from the sea.

6 Identification of hazards and risks

Methodology

6.1 The WHS manual *Managing Disaster Risks for World Heritage* (UNESCO June 2010) sets out a typology of hazards (UNESCO 2010, appendix 2), which has been used as a guide in this Plan. Risk is assessed by attribute of OUV and by buffer zone, and by likelihood of the hazard occurring (Tables 1 and 2 below).

6.2 The level of risk is 'scored' as the probability of the hazard occurring (very unlikely, score 1 to certain, score 5) multiplied by the potential severity of the occurrence (negligible, score 1 to catastrophic, score 5).

Overall Risk Score	Defined as	Description
1-6	Low risk	Low risk to life. Negligible or minor damage but reparable; low risk to attributes of OUV
7-12	Medium risk	Low risk to life. A degree of risk to attributes of OUV: some damage but recoverable, attributes not destroyed
13-19	High risk	Potential risk to life. Major damage to attributes of OUV, possibly some irrecoverable.
20-25	Very High risk	Very high risk to life. Irreparable damage to attributes of OUV, potential destruction of Property

Severity → Probability ↓	Negligible - 1	Minor - 2	Medium - 3	Major - 4	Catastrophic - 5
Very unlikely – 1	1	2	3	4	5
Possible - 2	2	4	6	8	10
Likely – 3	3	6	9	12	15
Very likely – 4	4	8	12	16	20
Certain - 5	5	10	15	20	25

6.3 The risks identified are set out by OUV attribute and by area in the register below, where the risk score reflects the potential worst case. For example, rock falls could be minor and pose little risk, or major and pose a significant threat to the population or to the attributes carrying OUV. Mitigation measures are included with each hazard.

REGISTER OF HAZARDS, RISKS AND MITIGATION

Attribute/ Area	Hazard	Risk	Likeli- hood of occu- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
Attributes of OUV							
a) Gorham’s & Vanguard Caves Neanderthal occupation; Bennett’s and Hyaena Caves	Rock fall	Inaccessi- bility	2	1-3	6	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. No-go fenced safety areas. Restricted access.	HMGoG Technical Services
	Erosion (natural)	Damage to deposits	1	1-3	3	Monitoring Stabilisation measures as appropriate.	HMGoG Technical Services
	Erosion (human made)	Damage to deposits	3	1-4 (exca- vations)	12	Routine monitoring. Research framework and question-led research only. Monitoring by International Committee.	HMGoG Gibraltar Museum
	Explosion	Damage to or destruction of deposits	1	3-4	4	Contingency plan. Restricted access to Gorham’s Complex. Security in place.	HM MOD
	Sea level rise	Erosion of deposits	3 in long term	5	15	No action; review general climate change.	HMGoG Environment Department
	Vandalism	Damage to deposits, damage to cave walls, damage to visitor experience and perceptions	1	3-4	4	Routine monitoring all features. Conservation-lead removal of modern and damaging graffiti. Signage to explain importance heritage features. CCTV.	HMGoG Gibraltar Museum

Gibraltar Neanderthals

Attribute/ Area	Hazard	Risk	Likeli- hood of occu- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
b) Gorham's Cave evidence of the first modern humans in the area.	Rock fall	Damage to deposits, loss of evidence Inaccessibility	2	1-3	6	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. No-go fenced safety areas. Restricted access Gorham's Complex.	HMGoG Technical Services
	Erosion (natural)	Damage to deposits, loss of evidence	1	1-3	3	Monitoring. Stabilisation measures as appropriate.	HMGoG Technical Services
	Erosion (human made)	Damage to deposits	3	1-4 (excavations)	12	Maintenance programme. Routine monitoring. Signage to inform and educate visitors.	HMGoG Gibraltar Museum
	Sea level rise	Erosion of deposits	3 in long term	5	15	No action; review general climate change.	HMGoG Environment Department
	Explosion	Damage or destruction to form and deposits	1	3-4	4	Contingency plan. Restricted access to Gorham's Complex. Security in place.	HM MOD
	Vandalism	Damage to deposits, damage to cave walls, damage to visitor experience and perceptions	1	3-4	4	Routine monitoring. Conservation-lead removal modern and damaging graffiti. Signage to explain importance heritage features.	HMGoG Gibraltar Museum

Attribute/ Area	Hazard	Risk	Likeli- hood of occu- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
c) The 426-metre high Jurassic limestone cliffs	Rock fall	Damage to geology. Damage to flora and fauna. Degradation of heritage assets and/or OUV. Damage to visitor experience and perceptions.	4	1-2	8	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. No-go fenced safety areas. Restricted access.	HMGoG Technical Services
	Erosion	Loss of form and evidence, possible damage to OUV. Damage to visitor experience.	2	1-2	4	Maintenance programme. Routine monitoring. Signage to inform and educate visitors.	HMGoG Environment Department
	Fire (natural eg. lightning)	Damage to flora and fauna	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan.	HMGoG Fire Service and Environment Department
	Fire (human induced)	Damage to flora and fauna	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan Improved signage.	HMGoG Fire Service, Environment Department and Tourism Department
	Pollution - litter	Damage to flora and fauna. Damage to visitor experience and perceptions	5	1	5	Routine cleaning and clearance all areas. Signage to explain importance of heritage features and damage caused by littering.	HMGoG Environment Department and Tourism Department

Gibraltar Neanderthals

Attribute/ Area	Hazard	Risk	Likeli- hood of occur- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
d) Pollen and charcoal evidence from Gorham's and Vanguard Caves	Erosion	Damage to deposits, loss of evidence	1	1-3	3	Monitoring. Stabilisation measures as appropriate.	HMGoG Technical Services
	Erosion (human made)	Damage to deposits, loss of evidence	3	1-4 (excavations)	12	Maintenance programme. Routine monitoring. Signage to inform and educate visitors.	HMGoG Gibraltar Museum
	Sea level rise	Damage to deposits, loss of evidence. Inaccessibility	3 in long term	5	15	No action; review general climate change.	HMGoG Environment Department
	Explosion	Damage or destruction of deposits	1	3-4	4	Contingency plan. Restricted access to Gorham's Complex. Security in place.	HM MOD
	Vandalism	Damage to deposits	1	3-4	4	Routine monitoring. Conservation-lead removal modern and damaging graffiti. Signage to explain importance of natural history and heritage features.	HMGoG Gibraltar Museum

Attribute/ Area	Hazard	Risk	Likeli- hood of occur- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
e) Recurring presence today of large numbers of birds, cetaceans, fish and bats - a uniquely substantial proportion of the fauna that existed at the time of the Neanderthals remains observable today as are some ecological processes.	Fire	Damage to flora and fauna	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan. Improved signage.	HMGoG Fire Service, Environment Department and Tourism Department
	Pollution – litter	Damage to flora and fauna. Damage to visitor experience and perceptions	5	2	10	Routine cleaning and clearance all areas. Signage to explain importance heritage features and damage caused by littering	HMGoG Environment Department and Tourism Department
	Pollution - traffic	Damage to flora and fauna. Damage to visitor experience and perceptions	3	1-4	12	Monitor traffic flow. Monitor visitor numbers and assess carrying capacity fully. Continue to restrict access. Assess options for alternative eco-friendly access.	HMGoG Environment Department
	Vandalism	Damage to bird and bat roosts. Damage to vegetation	2	1-5	10	Routine monitoring. Signage to explain importance of natural history and heritage features and damage caused by littering	HMGoG Gibraltar Museum, Environment Department and Tourism Department
	Water pollution by oil spill	Damage to attributes of OUV, loss of evidence	2	4-5	10	Marine Contingency Plan. Monitoring shipping activity.	HMGoG Environment Department and Port Authority

Gibraltar Neanderthals

Attribute/ Area	Hazard	Risk	Likeli- hood of occur- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
f) A well- preserved intertidal community of organisms on the rocky beach by Gorham's and Vanguard Caves	Vandalism	Damage to attributes of OUV, loss of evidence	2	3	6	Routine monitoring.	HMGoG Environment Department and Gibraltar Museum
	Sea level rise	Loss of attributes and OUV	3 in longer term	2	6	No action; review general climate change	HMGoG Environment Department
	Water pollution by oil spill	Damage to attributes of OUV, loss of evidence	2	4-5	10	Marine Contingency Plan. Monitoring shipping activity.	HMGoG Environment Department and Port Authority
Associative Attributes of OUV							
g) Submerged landscape features	Pollution	Damage or degradation of associative attributes	2	3	6	Marine Contingency Plan. Monitoring shipping activity.	HMGoG Environment Department
	Ship wreck	Damage or degradation of associative attributes	1	2	2	No action proposed to avoid Contingency Plan for rescue.	HMGoG Port Authority

Attribute/ Area	Hazard	Risk	Likeli- hood of occur- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
g) A massive fossil sand dune – the Catalan Bay Sand Dune	Erosion (natural) - Sand slip or slide	Damage or degradation of associative attributes	2	1-3	6	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. Restricted access.	HMGoG Technical Services
	Erosion (human made)	Damage or degradation of associative attributes	1	1-4	4	Maintenance programme. Routine monitoring. Signage to inform and educate visitors.	HMGoG Environment Department
	Rock fall	Damage to Dune, erosion	4	1-2	8	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. No-go fenced safety areas. Restricted access.	HMGoG Technical Services
	Fire	Damage to vegetation and fauna	2	1-4	8	Routine maintenance and clearance. Fire Disaster Plan Improved signage.	HMGoG Fire Service
	Pollution - litter	Damage to flora and fauna Damage to visitor experience and perceptions	1	1	1	Restricted access. Signage to explain importance heritage features and damage caused by littering.	HMGoG Environment Department

Attribute/ Area	Hazard	Risk	Likeli- hood of occur- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
h) The rich collections of artefacts and fossils excavated over the past 25 years as well as material from earlier excavations	Fire	Loss of evidence, loss of interpretation material, damage to visitor experience	1	1-5	5	Disaster Preparedness Plan.	HMGoG Gibraltar Museum and Fire Service
	Storage conditions	Damage to or loss of evidence. Loss of accessibility	1	1-5	5	Collections Management Plan. Routine monitoring.	HMGoG Gibraltar Museum
	Theft	Damage to or loss of evidence or loss of accessibility. Reputational damage	1	1-5	5	Disaster Preparedness Plan. Secure exhibits. Secure storage.	HMGoG Gibraltar Museum
	Vandalism	Damage to or loss of evidence or loss of accessibility. Reputational damage	1	1-5	5	Disaster Preparedness Plan. Secure exhibits. Secure storage. Guides and warders.	HMGoG Gibraltar Museum
Specific parts of candidate property							
Europa Advance Batteries Viewing Platforms	Pollution – litter	Damage to visitor experience and perceptions	1	1	1	Routine cleaning and clearance all areas. Signage to explain importance heritage features and damage caused by littering.	HMGoG Gibraltar Museum
	Pollution – vehicle	Damage to visitor experience and perceptions	2	1	2	Monitor traffic flow. Monitor visitor numbers and assess carrying capacity fully. Assess options for alternative eco-friendly access.	HMGoG Environment Department

Mediterranean Steps	Rock fall	Loss of form and evidence. Damage to visitor experience Damage to access paths	3	1-2	6	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. No-go fenced safety areas. Restricted access.	HMGoG Technical Services
	Erosion (natural)	Loss of form and evidence. Damage to visitor experience. Damage to access paths	2	1-3	6	Monitoring. Stabilisation measures as appropriate.	HMGoG Technical Services
	Erosion (human induced)	Loss of form and evidence. Damage to visitor experience. Damage to access paths	3	1-3	9	Maintenance programme. Routine monitoring. Signage to inform and educate visitors.	HMGoG Environment Department and Tourism Department
	Fire (natural)	Damage to flora, fauna. Damage to visitor experience. Danger to life	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan.	HMGoG Fire Service
	Fire (human induced)	Damage to flora, fauna Damage to visitor experience. Danger to life	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan. Improved signage.	HMGoG Fire Service
	Pollution – litter	Damage to flora and fauna. Damage to visitor experience and perceptions	5	1	5	Routine cleaning and clearance all areas. Signage to explain importance heritage features and damage caused by littering.	HMGoG Environment Department and Tourism Department

Buffer Zone							
Nature Reserve - west side, east side, south side	Rock fall	Loss of form and evidence. Damage to visitor experience. Damage to access paths	4	1-2	8	Probability analyses. Monitoring. Detailed surveys. Stabilisation measures as appropriate. No-go fenced safety areas. Restricted access.	HMGoG Technical Services
	Erosion (natural)	Loss of form and evidence. Damage to visitor experience. Damage to access paths	2	2	4	Monitoring. Stabilisation measures as appropriate.	HMGoG Technical Services
	Erosion (human induced)	Loss of form and evidence. Damage to visitor experience. Damage to access paths	2	2	4	Maintenance programme. Routine monitoring. Signage to inform and educate visitors.	HMGoG Environment Department
	Fire (natural)	Damage to flora, fauna Damage to visitor experience Danger to life	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan.	HMGoG Fire Service
	Fire (human induced)	Damage to flora, fauna. Damage to visitor experience. Danger to life	2	1-4	8	Fire breaks. Routine maintenance and clearance. Fire Disaster Plan. Improved signage.	HMGoG Fire Service
	Pollution – litter	Damage to flora and fauna. Damage to visitor experience and perceptions	5	2	10	Routine cleaning and clearance all areas. Signage to explain importance heritage features and damage caused by littering.	HMGoG Environment Department and Tourism Department

Attribute/ Area	Hazard	Risk	Likeli- hood of occur- rence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
Nature Reserve - west side, east side, south side	Pollution – vehicle	Damage to visitor experience and perceptions	5	2	10	Monitor traffic flow. Monitor visitor numbers and assess carrying capacity fully. Assess options for alternative eco-friendly access.	HMGoG Environment Department and Tourism Department
	Inappropriate development	Effect on character and perceptions	1	1-4	4	Town Development Plan including amendments to take account of the nominated property (Appendix 3). Routine monitoring all planning applications in property and buffer zone. Routine implementation protective policies. Annual review of implementation.	HMGoG Town Planning

Attribute/ Area	Hazard	Risk	Likelihood of occurrence	Potential Severity	Overall risk (worst case)	Mitigation	Responsible Body
Buffer Zone (Europa Advance Road)	Pollution – litter	Damage to flora and fauna. Damage to visitor experience and perceptions	5	1	5	Routine cleaning and clearance all areas. Signage to explain importance heritage features and damage caused by littering.	HMGoG Environment Department
	Pollution – vehicle	Damage to flora and fauna. Damage to visitor experience and perceptions	3	2	6	Monitor traffic flow. Monitor visitor numbers and assess carrying capacity fully. Assess options for alternative eco-friendly access.	HMGoG Environment Department
	Inappropri- ate develop- ment	Damage to vistas and views of Site; damage to OUV	2	2-3	6	Town Development Plan. Routine monitoring all planning applications in property and buffer zone. Routine implementation protective policies. Annual review of implementation.	HMGoG Town Planning Department

Appendix 3 – Town Planner’s (November 2014) draft amendments to the 2009 development plan to take the nominated property into account.*

Contents

1. Introduction	41
Justification for UNESCO Criteria	41
Integrity of ‘The Site’	41
Authenticity of ‘The Site’	41
Future status of this document	42
2. Site Context	42
Site Characteristics	42
3. General Policy Guidance	46
4. Future Policy Guidance and Action	49
Master Plan Objectives	49
5. Assessing the Impact of Future Development	51
Development proposals within the proposed World Heritage Site and its buffer zone- decision making process	51

1. Introduction

The first part of this planning policy document provides an outline of existing planning policy guidance, drawing together in one place the various existing policies which relate to the site. The policy document, and its advice in relation to the proposed World Heritage Site (WHS), is set out in the table 0.1 in chapter 4.

The second part of the document describes how some of the attributes of the site are represented as key views and how these views should be managed to ensure that Outstanding Universal Value (OUV) is not adversely affected and tarnished. Table 1 set out the 2009 Development Plan Policies that will need to be amended to assess future development and regeneration proposals to protect the integrity of the proposed WH site and its bid for World Heritage Site status.

Justification for UNESCO Criteria

The site’s OUV is in providing an exceptional testimony to the Neanderthals – a people and their cultural traditions – who are now extinct and of the earliest modern humans who followed them. The large volume of material evidence in the deposits of the caves within the site is permitting the most detailed reconstruction of their way of life available for any site at present. Additionally, it is documenting changes and constancy in cultural traditions through a significant time sequence and is providing new evidence that is changing our views of Neanderthal behavioural capabilities.

The information contained within the site presents an outstanding opportunity to understand and interpret the traditional lifestyle of the Neanderthals and early modern humans with their environment part of which, with the

sea level rise 10,000 years ago, was subjected to irreversible change. The environmental and taphonomic evidence from the cave deposits is allowing a detailed description of the manner in which Neanderthals, and later on modern humans, interacted with and exploited their environment. The evidence of climate change and sea level rise and fall contained in the cliff deposits and the fossil sand dune provide important contextual information of outstanding quality. The raised beaches and geological evidence of landslides and cliff collapse provide additional information of tectonic activity. The relict cliff vegetation and elements of the fauna brings to life the ecological context of the world of the Neanderthals and early modern humans.

Integrity of 'The Site'

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The complete series of attributes that give the sites OUV are wholly contained within the property. The attributes, and the site as a whole, are not at risk and are all within the boundaries of the Gibraltar Nature Reserve. The archaeological and paleontological deposits are protected by the caves themselves. They are stable and there is currently no risk of loss of integrity.

Authenticity of 'The Site'

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning.

- 1) The stratified deposits within the caves which contain a wealth of information that situates the site in a temporal framework are wholly authentic in material and substance. Within the deposits are artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first Modern Humans. A Neanderthal rock engraving is situated in the inner chamber of Gorham's cave and parietal art from the Solutrean culture is found in the main and inner chambers of Gorham's Cave and also in Martin's Cave;
- 2) the form and substance, as well as the location and setting of the caves themselves and the surrounding cliffs, their geological formations and the tangible evidence of climate and sea level change in the form of ancient beach levels; and
- 3) The well-preserved relict cliff vegetation and specific faunal elements that have a direct connection with the vegetation that grew on these cliffs when Neanderthals and modern humans lived in the caves.

The attributes convey the site's meaning at two different levels:

- (a) The whole property and how it conveys value through an overarching authenticity; and
- (b) The individual attributes that convey specific information about particular aspects of the site.

The authenticity of the information derived, forming the basis of site's meaning, is guaranteed by the extent to which the archaeological deposits survive intact as well as through an extensive list of publications in the international, peer-reviewed, literature. This information also serves to document and understand the continuing functions (vegetation dynamics, geological erosion and sea level interplay, bird migration systems) of the site and its former use by Neanderthals and the first modern humans to reach the area. Importantly and exceptionally, the information obtained is opening a window into the traditions of the Neanderthals and crucially, via the long temporal sequences available, is providing a detailed documentation of changing traditions (e.g. in stone tool technology and in resource exploitation) over time.

The authenticity of location and setting of the property, through its attributes, allow for a clear understanding of a place which had been occupied by people – Neanderthals and modern humans – for millennia. Though more difficult

to demonstrate, the impressive topography and setting, is highly suggestive of a location that would have had spiritual meaning to the earliest inhabitants, just as it did to later generations (e.g. Phoenicians and Carthaginians) who recorded that sense and even used the site to make offerings to the gods.

Future status of this document:

2. Site Context

Site Characteristics

The site provides a unique 100,000-year sequence of occupation by the Neanderthals. It is located at the south-western extreme of the Neanderthal geographical range in climatic conditions that were buffered from the impact of the northern glaciations. Such conditions were rare in the Neanderthal geographic range and permitted recurrent occupation of the site over a long time span. The site is thus of exceptional value because it establishes the baseline for all Neanderthal sites and situates the Neanderthal presence in a strong ecological context that permits a detailed understanding of their way of life and the causes of their demise. The subsequent presence of early modern humans offers an exceptional opportunity to compare the lifestyles of two human lineages within the same eco-geographical context. The human occupation sequence is set within a geological backdrop which provides rich evidence of tectonic activity, climatic conditions and climate-driven oscillations in sea-level. In addition, the site retains significant elements of natural vegetation, fauna, ecological and geological processes that existed at the time when Neanderthals lived on the Rock of Gibraltar. Put together, the components comprising the site offer the most complete picture of a Neanderthal habitat anywhere in the world. Importantly, there are significant components surviving to the present which provide a universally unique opportunity to study and recreate the Neanderthal way of life in a natural context.

The nominated WHS property is an area of the Rock largely unaffected by modern development. It extends from sea level to the top of the Rock at 426m AOD and is covered by natural vegetation. The site is traversed by a pathway, the Mediterranean Steps, parts of which date to the 19th Century. At its southern extremity, it includes a short stretch of modern road. Apart from this the only man-made features are a small number of historic military structures such as gun and searchlight batteries and some associated buildings, themselves of historic interest. There are no occupants within the candidate world heritage site, and only fifty in the wider buffer zone. Land is either owned by HM Government of Gibraltar (HMGoG) or the UK Ministry of Defence.

The candidate site's boundaries are clearly visible as natural topographical boundaries. They delimit all the attributes that confer outstanding universal value and follow natural topographical features which encompass the five major morpho-tectonic units of the Rock of Gibraltar. The eastern boundary is delimited naturally by the Mediterranean coastline. At the southern end the boundaries start at sea level immediately south of and below the First and Second Europa Advance Batteries, rising vertically to take in the Batteries and running along the Europa Road wall to the Burma Road gate. The boundary runs across the gate and then follows natural cliff lines below Levant Battery to the highest point at the top of the Rock. The western boundary is delimited by the ridge of the Rock turning east where its northern boundary follows a steep topographical discontinuity ('valley') in the contours to the top of the Dudley Ward Tunnel entrance and reaching sea level again south of the Ammunition Jetty.

A buffer zone has been defined to protect the key elements of the candidate site. Its boundaries are coincident with those of the legally-protected Nature Reserve to the north and west. At the southern end the boundary again lies within the Nature Reserve but is delimited by the natural cliff below Windmill Hill Flats, rather than the Reserve Boundary.

The eastern boundary interfaces directly with the Mediterranean Sea, in a part that is currently the Southern Waters of Gibraltar Site of Community Importance (hereafter "SCI") approved by EU Commission Decision 2006/613/EC (July 2006) under the Habitats Directive. It was declared a dual SAC/SPA by HMGOG under the Special Area of

Conservation (Southern Waters of Gibraltar) Order 2012 and the Special Protected Areas Order 2011. To the south the site is bounded by the eastern Windmill Hill Flats cliffs, Europa Advance Road and the coastal sea cliffs between Halfway Battery and The Site. Within this area there is currently a crematorium, an environmental park and a waste to energy plant (with associated facilities), the latter in the process of being dismantled.

After careful analysis the Steering Group Committee has chosen the following attributes as those which give the site its OUV:

- a) Four caves – Gorham’s, Vanguard, Bennett’s and Hyaena – were occupied by the Neanderthals for 100,000 years. Together, they contain a rich archive of stone tools, remains of camp fires, bones, molluscs and pollen that permit a detailed reconstruction of climate and ecology, as well as Neanderthal behaviour, and changes through time (Figure 3.2). Two of these caves (Gorham’s and Vanguard) have been the subject of research over the past 25 years; the other two (Bennett’s and Hyaena) have been left untouched. Gorham’s and Vanguard Caves have 18- and 17-metre deep sequences respectively and thus have an extraordinarily high potential for further research. The material from the excavations includes the largest collection of fossil bird species from this period anywhere in the world (150 species). The evidence from these caves is permitting a reappraisal of Neanderthal cognitive capacities and subsistence economy. In addition to having provided the first clear evidence of abstract thinking by the Neanderthals in the form of a rock engraving, they have also demonstrated the active selection by the Neanderthals of birds of prey and crows with black feathers, hinting at previously unsuspected behaviour patterns indicative of symbolism and ornamentation. The research in Gorham’s and Vanguard Caves has also revealed, for the first time, the regular exploitation of birds and marine animals for food with clear evidence of processing including cooking. Approximately 70% of the archaeological deposits at Gorham’s Cave, 90% of those at Vanguard Cave remain unexcavated. The adjacent Bennett’s and Hyaena Caves hold significant potential for future research within the terms of the research framework and are currently left untouched in reserve.
- (b) Gorham’s Cave also provides complementary comparative evidence of the first modern humans in the area. In addition to stone tools, camp fires and palaeontological material, Gorham’s Cave has revealed examples of mobile and parietal art dating back to at least 20,000 years ago. Martin’s Cave has parietal art and evidence of early modern humans as do the Goat’s Hair Twin Caves.
- (c) The 426-metre high Jurassic limestone cliffs within the site provide a unique record of sea-level change, with evidence of fossil beaches at 5m above present sea level (Figure 3.3), and tectonic uplift, with raised beaches, dunes and scree slopes at different levels up to 210m AOD. The cave sequences are therefore embedded in a wider time frame which is recorded by the geological formations within the site, currently estimated at around 3 million years, and encompass the entire Quaternary and part of the Pliocene.
- (d) Pollen and charcoal evidence from Gorham’s and Vanguard Caves has shown that many of the plant species growing on the limestone cliffs and ledges today were also present when the Neanderthals lived on the Rock. The well-preserved vegetation on Mediterranean Steps and adjacent cliffs on the site provides a living testimony of the world of the Neanderthals and the functions of the ecosystems of which they were a part.
- (e) Today there is a recurring presence of large numbers of birds, many of species recorded as fossil contemporaries of the Neanderthals in the caves, which utilise Gibraltar as a point of transit during their annual migrations between Europe and Africa as they would have done at the time of the Neanderthals. There are, additionally, several cliff-nesting resident birds which appear to have lived here since the time of the Neanderthals. Offshore, cetaceans and fish (including tuna), also recorded within the caves as fossils, continue their presence and migrations between the Atlantic Ocean and the Mediterranean Sea. Bats, of species also found in the fossil record, also continue to visit the site today. Put together, a uniquely substantial proportion of the fauna that existed at the time of the Neanderthals remains observable today as are some ecological

processes, especially connected with migration.

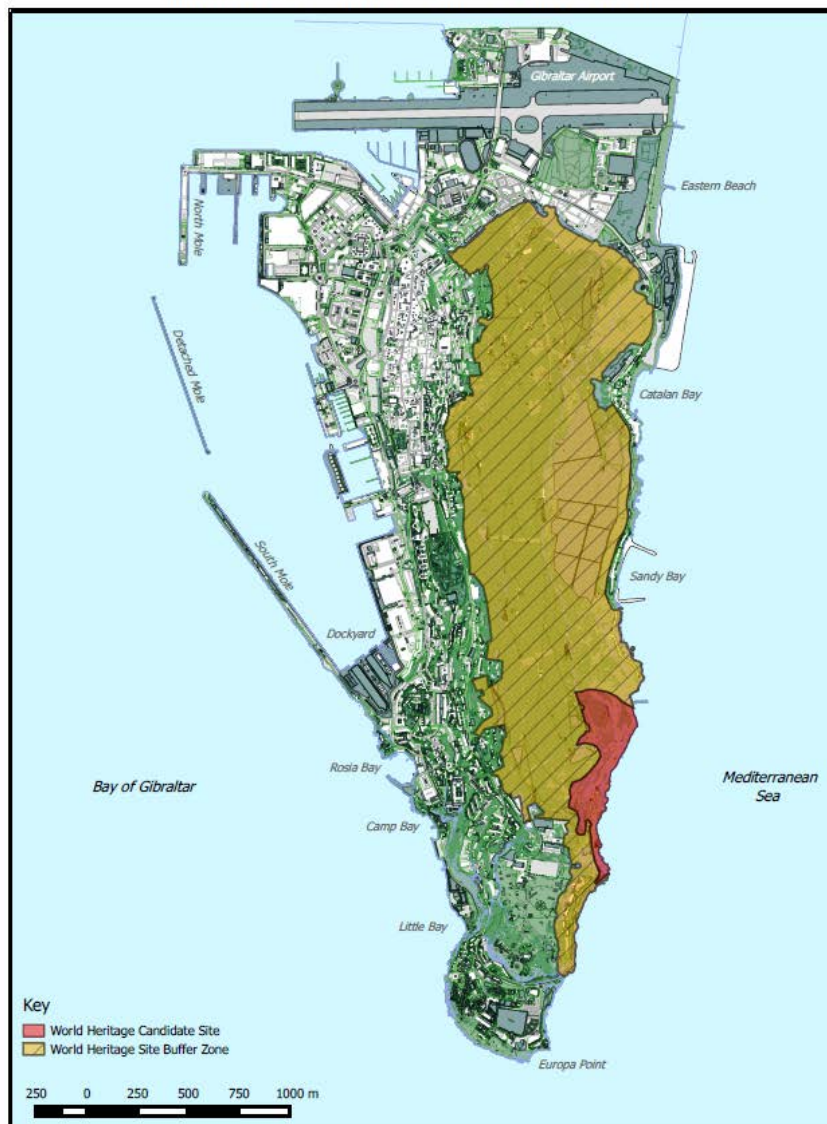
(f) A well-preserved intertidal community of organisms on the rocky beach by Gorham’s and Vanguard Caves with many species which are recorded inside the caves as having been consumed by Neanderthals and early modern humans during the Late Pleistocene (Figure 3.4).

There are attributes which do not form part of the property but which provide contextual information about location, setting, use and function of the site itself. These associative attributes therefore have a direct bearing on and support its Outstanding Universal Value:

(g) Submerged landscape features and a large fossil sand dune – the Catalan Bay Sand Dune – which are relics of the Neanderthal landscape when sea levels were lower than today (Figure 3 5). The submerged features include Flysch pinnacles at -30m, which are associated with freshwater springs, indicative of the wider landscape at the time of the Neanderthals and of the presence of coastal oases. These features have been modified to some degree by human activity, particularly in relation to the Second World War, but they are of sufficient contextual importance to be considered associative attributes.

The location of the candidate World Heritage Site and proposed buffer zone can be seen

Gibraltar World Heritage Candidate & Buffer Zone Sites



outlined in Map 0.1 below. Map 0.1

'The Site' shall incorporate:

1. The sea caves known as the Gorham's Cave Complex (comprising Gorham's, Vanguard, Bennett's and Hyaena Caves);
2. The cliffs above the Gorham's Cave Complex to the highest peak of the Rock at O'Hara's Battery (426 metres a.s.l., hereafter "m."), including the Mediterranean Steps, Martin's and other caves.

The Buffer Zone shall include;

1. The fossil sand dune on the east side of Gibraltar, from Sir Herbert Miles Road to its contact with the cliffs above 300 m., and the cliffs and caves (including Sewell's Cave, also known as Cave 'S') directly above the dune.
2. The Upper Rock Nature Reserve with respect to the parts of the nature reserve nearest to the proposed HWS.

Notwithstanding the above many other cultural heritage sites of interest fall within the area including military installations, the Mediterranean Steps and some caves which do not contribute directly to the Site's (OUV).

Existing buildings presently within The Site

Protected buildings within The Site:

O'Haras Battery,
Levant battery,

3. General Policy Guidance

The section introduces the existing planning policy framework that is currently in place relating to designated zones and land use matters set within the Gibraltar Development Plan (GDP) 2009. The following table has been provided to summarise all the relevant policies in effect to date which encompass in some way 'The Site' and its buffer area.

Policy Document:	Relevant Policies 2009 and UNESCO new policy requirements	Summary of advice for Planning Zones 2014 and revised and new policies to comply with the proposed nomination as a UNESCO site
Gibraltar Development Plan (2009)		
Zone 4 - Eastside	<p>Policy Z4.1 - The Eastside Project</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>The site of the East side project is of approximately 16ha and has been designated for the construction of mixed use development under Policy Z4.1. (This site is located immediately north of the northern buffer zone of the proposed World Heritage Site).</p> <p>Any future development proposals for this site shall have to be carefully assessed vis-à-vis protected vistas and setting regarding the WHS.</p>

	<p>Policy Z4.4 – Both Worlds Car Park</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>This policy allocates a site south of both worlds complex for the use of multi-storey car park. This is in very close proximity to The Site.</p> <p>Any future proposals would have to be assessed vis-à-vis the WHS.</p>
	<p>Policy Z4.5 – The Water Catchments</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>Introduce a new policy to restrict any development in area of the former water catchments encompassing the Great Sand Slopes.</p> <p>No development shall be permitted on the site known as the great sand slopes. (Catalan Bay Sand Dune).</p>
Zone 7 - Europa	<p>Policy Z7.1 Europa Point Environmental Improvements</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>The Environmental Improvement scheme been completed, further regeneration of the site for touristic/ recreational and educational purposes will be encouraged.</p> <p>Any new environmental improvements in the area shall need to be assessed vis-à-vis protected vistas and/or setting regarding the WHS.</p>
	<p>Policy Z7.2 – Waste Water Treatment Works</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>This policy designates the site of the ex-brewery crusher to be allocated for a new waste water treatment plant.</p> <p>The submission of an application for planning permission and its associated Environmental Impact Assessment is imminent shall need to be assessed vis-à-vis protected vistas and/or setting regarding the WHS</p>
	<p>Policy Z7.3 – Energy from waste facility</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>This policy is intended to enable the regeneration of the recently demolished energy from waste facility.</p> <p>The submission of an application for planning permission at Europa Advance Road and its associated Environmental Impact Assessment shall need to be assessed vis-à-vis protected vistas and/or setting regarding the WHS.</p>

	<p>Add new proposed policy requirements relevant to UNESCO WHS nomination</p>	<p>Policy Z7.9 – Gorham’s Cave Complex and its associated WHS</p> <p>No permission shall be granted to any development or building operations within the Gorham’s Cave Complex and its associated areas within WHS unless approved by the pertinent authority for the WHS. Any proposals will include an appropriate Heritage Impact Assessment as part of an Environmental Impact Assessment.</p>
Zone 9 - Upper Rock	<p>Policy Z9.2 - Non-residential Development in the Upper Rock Nature Reserve</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>Non-residential development will be restricted to appropriate uses that maintain openness; or involve educational facilities related to the environment; and can substantiate no significant adverse effect on the environment; and prove necessary for the Upper Rock’s viability as a nature Reserve and tourist attraction.</p> <p>All developments within the Nature Reserve in the vicinity of the WHS shall be assessed against any potential impacts on the cultural character/ ecology of the WHS.</p>
	<p>Policy Z9.5 – Utility Development within the Nature Reserve</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>Essential utility development within the Nature Reserve will normally be granted provided the justification for it is adequate, alternative sites have been investigated and that the proposal is sited and designed so as to minimise negative impacts.</p> <p>Any new installations would have to be carefully assessed against any potential impacts on the character/ ecology of the reserve and shall need to be assessed vis-à-vis protected vistas and/or setting regarding the vicinity WHS.</p>
	<p>Policy Z9.6 – Protection of ridgeline</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>Proposed development which impinges on ridgeline of the Upper Rock will not normally be permitted.</p> <p>Proposed new development shall need to be assessed vis-à-vis protected vistas and/or setting regarding the WHS</p>

	<p>Policy Z9.7 – Development adjacent to the Nature Reserve</p> <p>Proposed Amendment/additional policy requirements relevant to UNESCO WHS nomination</p>	<p>Future development proposals for this area will be restricted to those which: A) benefit tourist/ recreational facilities; and B) Are of a low density; or C) involve infrastructural improvements; or D) have no adverse impact on the reserve.</p> <p>New applications within the Nature Reserve in the vicinity of the WHS shall need to be assessed vis-à-vis protected vistas and/or setting regarding the WHS.</p>
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4. Future policy guidance and action

Master Plan Objectives

Further to the site appraisal and extensive studies which have been made of the sites principally by the Ministry for Culture and Heritage, the following are considered to be the key development principles that the updated plan must address;

STRATEGIC PRINCIPLES

The principles and policies for the protection and sustainable use of the WHS apply both to the site itself and as appropriate, to its buffer zones.

Principle 1: To protect and where possible enhance the Site’s OUV and the attributes which convey that value.

Principle 2: To protect the Site, it’s OUV and its setting, including key vistas and landscape elements from inappropriate development or change. Protecting the WHS from the effect of changes minor but which, on a cumulative basis, could have a significant effect or erode its OUV, integrity, authenticity and significance.

Principle 3: To regard the WHS and its setting as a “sensitive area” for the purposes of the Environmental Impact Assessment (EIA) Regulations. Therefore to ensure that in all cases where proposals might adversely affect the Site’s OUV, vistas or setting, proper Environmental Assessment, including Heritage Impact Assessment, is carried out. Identifying the level of risk posed to the retention of OUV and the likelihood that the property may be in potential or actual danger. Design and access statements will also be required.

Principle 4: To enhance the environment of The Site and its setting where appropriate and possible through positive management.

Principle 5: To strike a balance between the needs of conservation, biodiversity, access, interests of the local community and the sustainable economic use of the WHS in its setting.

Principle 6: To improve appropriate and sustainable access to The Site and its setting, to enable visitors to enjoy a welcoming experience and high quality facilities.

Principle 7: To raise public awareness of The Site, it’s OUV and the values of World Heritage locally to globally and therefore to enhance community cultural & natural heritage and educational assets for the benefit of the local population and visitors.

Principle 8: To ensure that Gibraltar's unique tourist attractions are protected and enhanced/developed sensitively.

Principle 9: To protect The Site from climate change as far as practicable, while ensuring that mitigation is not at the expense of authenticity or integrity.

Principle 10: To support and demonstrate exemplary Site management.

PROPOSED POLICIES

Policy 1: No development (including telecoms or other infrastructure) will generally be permitted within the boundaries of the WHS unless following the process of the EIA and the planning process of Gibraltar they are deemed not to adversely affect the integrity of the WHS and The Site's OUV and with the exception of proposals to improve signage or interpretation or safe access. All such proposals will be subject to EIA; all such proposals must meet the highest design standards

Policy 2: Development proposals in buffers zones and adjacent areas (including Europa, Lathbury, Catalan Bay, Both Worlds, East Side) that would adversely affect The Site's OUV, authenticity, integrity, strategic vistas or landscape character, will not generally be permitted unless following the process of the EIA and the planning process of Gibraltar they are deemed not to adversely affect the integrity of the WHS and The Site's OUV.

Policy 3: The setting of visible monuments and sites in the landscape WHS and their inter-relationships will be maintained and enhanced.

Policy 4: Scale, massing, height and design of any proposals for development in adjacent areas should be proportionate to retaining or enhancing the WHS's OUV. All such proposals will be subject to EIA and the planning process of Gibraltar; all such proposals must meet the highest design standards.

Policy 5: Improve the presentation and natural beauty of The Site and setting by encouraging the removal or amelioration of derelict structures, intrusive infrastructure, or the results of acts of vandalism. Environmental improvements may include:

- Re-location of the clay-pigeon shooting facility on Europa Advance Battery and clearance of rubbish
- Re-location of recycling facilities
- Removal of non-native and/or dead vegetation
- Removal of inappropriate hard landscaping such as fencing
- Removal of metal structures from the East Side Great Dune (Catalan Bay Sand Dune)
- Removal of metal and other detritus from the beaches

Policy 6: Provision of improved signage and information panels, virtual information sources and other gateways to give consistent and clear information about The Site, how to access it, and how to move around it sustainably. The provision of both information points within the candidate WHS and at other key locations around the Rock shall need to follow the planning process of Gibraltar.

Policy 7: To support the development, delivery and management of new or improved visitor facilities to interpret, understand and celebrate the WHS, including (but not exclusively) facilities for an information and archive centre. New facilities should meet high standards of quality, sustainability and accessibility in architecture, landscaping, construction, and delivery of interpretation messages

Should the Gibraltar bid for the WHS be successful, future decisions on developing planning policy and on development proposals within the proposed WHS and its buffer zone will be required to be run through the statutory planning process.

5. Assessing The Impact of Future Development

The eastern side of Gibraltar retains a largely natural character. The Site's footprint occupies a large proportion of the eastern side and its conservation will guarantee its character for future generations. The east side of the Rock, including The Site, falls completely under Zones 4 and 7 of the current GDP (2009). The main concern arising from potential future developments is the visual impact that they might have towards the OUV.

Development proposals within the proposed World Heritage Site and its buffer zone- decision making process

The following projects (which are at different stages of execution), would have to be considered in the EIA and whose own EIA's would have to consider the presence of a Candidate World Heritage Site close by, have been identified:

- (a) Policy Z4.1 of the GDP (2009) provides for a site of approximately 16 ha which is allocated for a mixed development comprising commercial, residential, tourism, recreational and leisure uses, including a yacht marina.
- (b) Policy Z4.4 identifies a site at the southern end of the Both Worlds Complex for a multi-storey car park and more recently the submission of a new Nursing Home.
- (c) Policy Z7.2 allocates the site of the ex-brewery crusher for the development of a waste treatment plant works.
- (d) There is currently a submission to the Development and Planning Commission (DPC) for the redevelopment of parts of the Caleta Hotel and for additional villas to the south of the main complex.
- (e) There is currently a submission to the DPC for a residential development south of Both Worlds.
- (f) HMGoG has plans for the siting of a waste disposal plant along Europa Advance Road.
- (g) The DPC is considering plans for the building of a football stadium at Europa Point, which is at the EIA stage.

Should The Site be successful, future decisions on changes to planning policy and on development proposals within the proposed WHS and its buffer zone will be run through the statutory planning process.

* This document is subject to stakeholder consultation and HMGOG ratification.



GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS

World Heritage Site Nomination



Volume 4: Draft Research and Conservation Strategy



Department
for Culture
Media & Sport



The
Gibraltar Museum



HM Government
of Gibraltar



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Acknowledgements

This nomination has been produced by the Gibraltar Museum on behalf of HM Government of Gibraltar, and the Gibraltar Neanderthal Caves and Environments World Heritage Steering Group.

Further copies of this Nomination may be obtained from:

The Gibraltar Museum
18-20 Bomb House Lane
Gibraltar

Tel. + 350 200 72489
Fax. + 350 200 79158

E-mail: clive.finlayson@gibmuseum.gi

<http://www.gibmuseum.gi>

The World Heritage Bid has been led by the Gibraltar Museum. Other organisations and departments on the World Heritage Steering Group are: the Office of the Deputy Chief Minister, the Department of the Environment, the Town Planning Department, Technical Services Department, Gibraltar Tourist Board, University of Gibraltar, Gibraltar Nature Conservancy Council, the Gibraltar Botanic Gardens, Gibraltar Heritage Trust, Gibraltar Ornithological and Natural History Society, English Heritage representing HM Government UK Department for Culture, Media and Sport, and HM Government UK Ministry of Defence.

Members of the International Research and Conservation Committee comprise the Doñana Biological Station, World Heritage Site, Spain; the University of Haifa and Mount Carmel World Heritage Site, Israel; University of Louvain, Belgium; University of Tarragona and Atapuerca World Heritage Site, Spain; and the University of York, United Kingdom.

In addition to stakeholders mentioned above, the preparation of the bid has benefited from advice from ICOMOS-UK and the UK National Commission from UNESCO.

Table of Contents

1. Introduction	6
2. Brief description of the site	7
3. Gorham's and Vanguard Caves	10
4. Brief history of excavations at Gorham's and Vanguard Caves	13
5. The International Research and Conservation Committee	15
6. Operational procedure	18
7. Research and Conservation Strategy	19
7.1 Guiding principles	19
7.2 Over-arching policy objectives of the nomination	19
7.3 Research objectives	20
7.3.1 Specific research objectives 2015-2019	21
8. Dissemination	26
8.1 Scientific publication	26
8.2 Educational information and services	26
8.3 Promoting awareness and understanding of the site and its values	27
8.4 Visitation - welcoming local people and visitors to the site at levels which it can sustain	27
9. Resources and training	27
10. Government commitment through funding	27
References	28
Appendix 1	29
Appendix 2	31

Draft research strategy for a nominated World Heritage Site

1. Introduction

The site known as the Gibraltar Neanderthal Caves and Environments, situated on the eastern side of the Rock of Gibraltar (Figure 1), is in the process of nomination for UNESCO World Heritage Site Status. The site is of universal importance and is a major contributor to our understanding of human evolution, particularly the behaviour and ecology of the Neanderthals. This importance derives from research which has been undertaken at the site since 1989 and from the remaining deposits whose potential could guarantee decades of research. If inscribed, the site would add value to the World Heritage List and would make a significant contribution towards the diversification of the list.

Archaeological excavation, which has brought to light the uniqueness of the site, is by its very nature destructive. The excavated sediment and its contents are removed, the latter retained as part of the collections of the Gibraltar Museum. Detailed contextual information is recorded during the excavation process. It is important, nevertheless, that a significant volume of deposit, representative of all the episodes recorded within the site, is retained for future generations of scientists to study. While it has never been the Gibraltar Museum's plan to excavate the caves within the site to the level of total removal of all deposits, it is important that a strategy is put in place that formally records the scientific objectives and excavation plans alongside a conservation strategy that ensures protection of significant elements of cave deposits. This strategy will also have regard to the long-term potential natural erosion of deposits (such as from sea level rise) and of the need to ensure that loss - both physical and intellectual - due to such processes is minimised. Excavation of deposits which might become endangered, not currently a concern, may be a conservation solution in such cases.

The process of scientific research has the added dimension of dissemination and interpretation of results to a wide public. Nomination includes plans for making the site accessible to a wide public while providing for its conservation. This means that certain, sensitive areas of the site will have limited or restricted access while others will be open. The provision of information will be focused at interpretation facilities within Gibraltar and online. Additionally, a strong educational programme is being developed to supplement an already existing scheme which includes hands-on experience for schools. The use of the latest results from the scientific research at the site, which changes constantly as new discoveries are made, is a key element of the research and conservation strategy (Volume 3: The Management Plan outlines these matters in detail).

The ultimate aim of the research and conservation strategy is to ensure the protection of the site while catering for the need to continue the research that is so vital for its understanding and hence its conservation. This document addresses the research aspects – the gathering and dissemination of information, and underpinning principles - which are a central tenet of the conservation of the property, focusing on the two large sea-level caves which have provided crucial information over the past 25 years. The research strategy develops a model for furthering our understanding of Neanderthal behaviour and ecology over long timescales in a range of environments. It uses a combination of archaeological evidence and present-day biological proxies to develop quantitative ecological

reconstructions to aid understanding of the Neanderthals, their behaviours and their environments. Such an approach could be considered as a template for other sites with similar characteristics, whether they are already World Heritage sites or aspiring to inscription.

Once approved by the International Research and Conservation Committee (Section 5), the strategy for the whole nominated property will be published as an open-access document.

2. Brief description of the site

The property lies on the eastern side of the Rock of Gibraltar, on the south-western tip of the Iberian Peninsula (Figure 1) and only 21 kilometres (km) from the coast of North Africa. It marks the north-eastern limit of the Strait of Gibraltar which connects the Mediterranean Sea with the Atlantic Ocean. The Rock is therefore situated in the heart of a major geographical nexus where two continents and two large bodies of water meet. It has been known since classical times as the northern Pillar of Hercules - *Mons Calpe*. Together with Jebel Musa (*Mons Abyla*, the other Pillar) on the Moroccan coast opposite, it has been a universally-recognisable silhouette and one of the Earth's major landmarks to mariners for millennia. The Rock extends from current sea level to its ridgeline at 426 metres (m) AOD, within the nominated property.

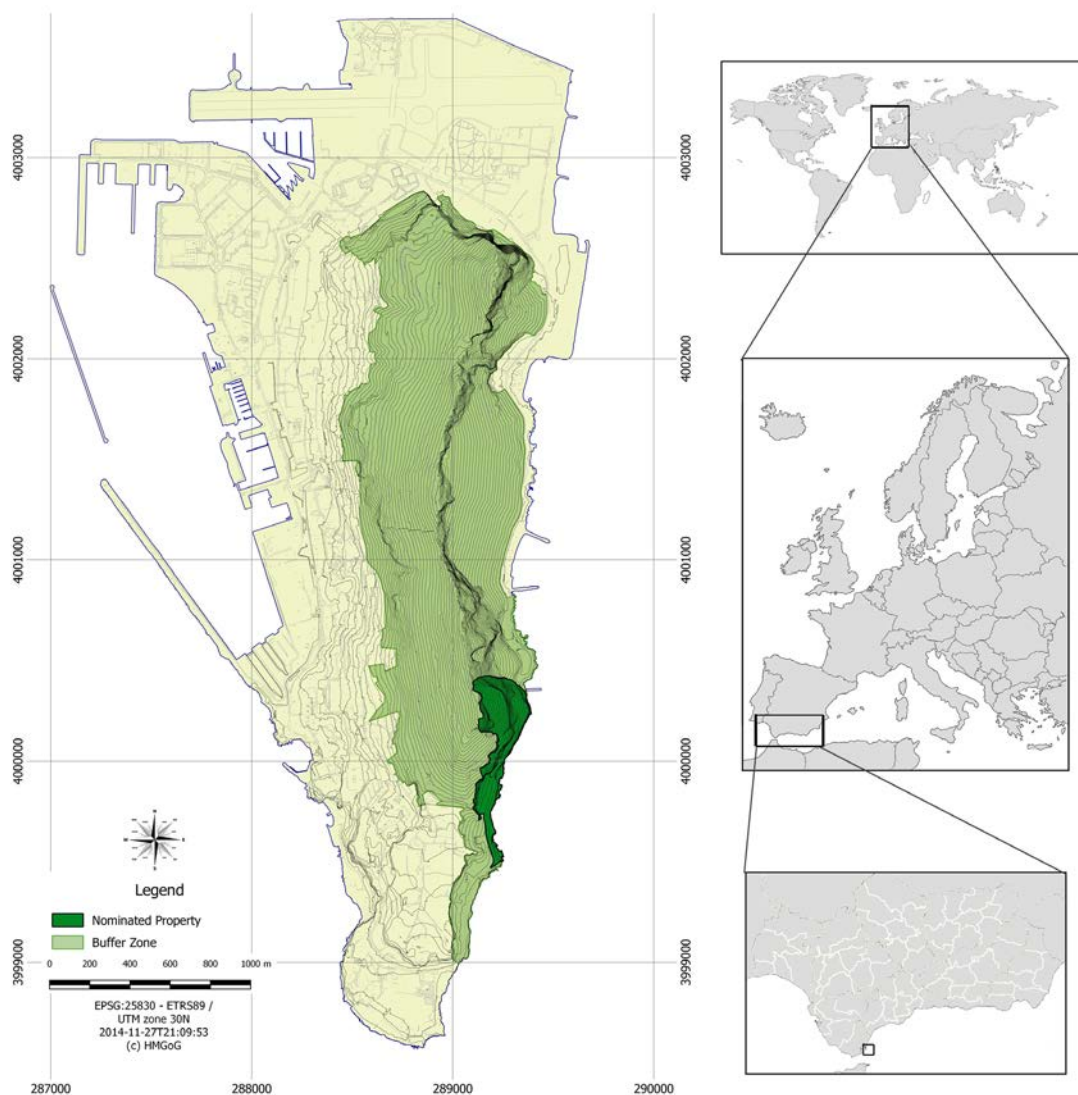


FIGURE 1 Location of the property.

The property is a Neanderthal occupation site that retains features and functions which have persisted to the present day. The coastal plain, which along with the cliffs, was the hunting ground of the Neanderthals, is currently submerged. But it would have been emerged for long periods except at high-level sea stands in inter-glacials, and during the past 10,000 years.

The property's principal components are two large sea-level caves – Gorham's and Vanguard - which contain an exceptional archaeological and palaeontological record of Neanderthal occupation over a period of approximately 100,000 years (Figure 2). It is the longest and most detailed record of the Neanderthals' way of life that is currently available. The caves are situated at the base of an impressive cliff that has additional caves and shelters, tectono-eustatic features, including raised beaches and fossil dunes, cliff vegetation, avifauna and intertidal invertebrate communities. Four caves within the property (Gorham's, Vanguard, Bennett's, Hyaena) have evidence of Neanderthal presence and four (Gorham's, Martin's and the Goat's Hair Twin Caves) of modern humans after the Neanderthals.

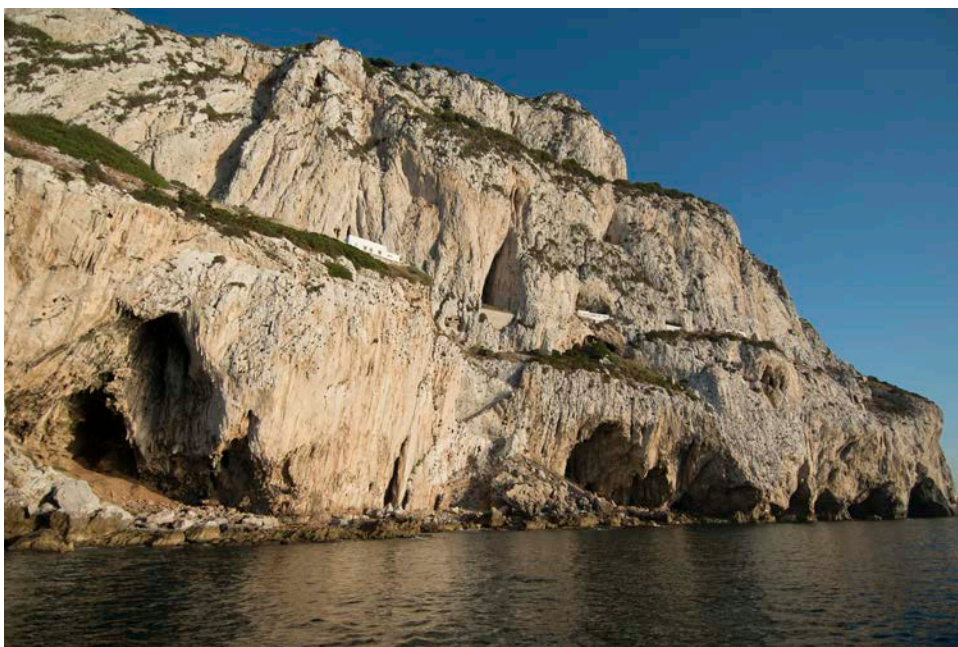


FIGURE 2 The property's principal components are two large sea caves. Gorham's Cave is on the left of the picture and Vanguard Cave is next on the right.

The property is currently under nomination for inscription as a UNESCO World Heritage Site. It covers an area of 28ha which constitutes 3.3% of the entire territory of Gibraltar (Figure 3). With the buffer zone included the area of the territory covered is 40.7%.

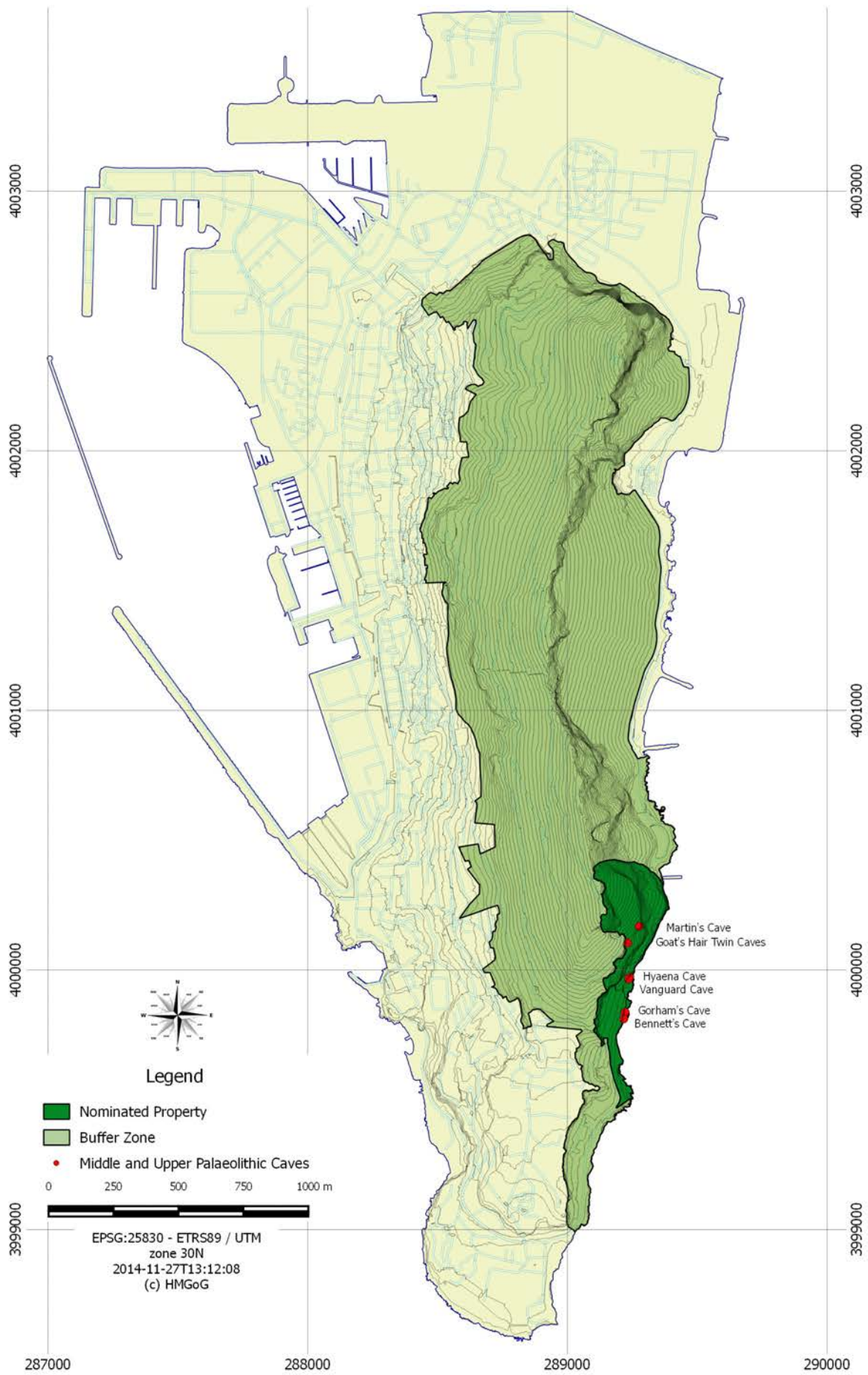


FIGURE 3

Map of the property and its buffer zone showing location of Palaeolithic caves. Four caves within the site (Gorham's, Vanguard, Bennett's, Hyaena) have evidence of Neanderthal presence and four (Gorham's, Martin's and the Goat's Hair Twin Caves) of modern humans after the Neanderthals.

3. Gorham's and Vanguard Caves

Gorham's and Vanguard Caves are the most important caves within the property. They contain sediments that were deposited by a combination of external dune infill and internal organic (e.g. guano, pollen, charcoal and bones) and inorganic (e.g. stone tools, stalagmites) deposits. The organic deposits include the remains of Neanderthal activity, notably butchered animals. They represent input from the exterior terrestrial habitats at a time when the coast was several kilometres away from the caves. These are the two caves that continue to offer the highest research potential through archaeological excavation. The main consideration of the research and conservation strategy presented in this document is therefore the balance between excavation, by its very nature a destructive process, and conservation of deposits for the future and their presentation.

Gorham's is a large sea cave, the largest within the property (Figure 4) with a depth of 92m. At the back of the cave there is a chamber that extends a further 35m, giving the cave a total depth of 127m. The cave has a height of 40m and width of 70m at its entrance. The depth of archaeological and palaeontological sediments is 18m and the stratigraphic record at Gorham's Cave has revealed that Neanderthals occupied this site between 120,000 and 32,000 years ago (Rhodes, 2012; Jimenez-Espejo *et al.*, 2013), right to the end of their existence (Finlayson *et al.*, 2006).

Recent re-dating of other sites using new decontaminating techniques suggests that some radiocarbon dates become older than previously estimated, although this is not the case for all sites. The late Gorham's Cave dates are in the process of revision with this new technique to confirm their age. However, it is unlikely that all the existing dates will become older than 40,000 years with the new method. Some are currently as young as 32,000 years and there is a sequence of dates spanning the time frame 32,000-40,000 years ago. The currently-proposed date for the Neanderthal extinction, on the basis of revised dates from a number of sites, is 40,000 years ago. Even if all Gibraltar dates were re-calibrated in the 40,000-year range, they would still represent a late survival site, and the only remaining question would be whether Gibraltar was part of general pan-European extinction or a much later survival in isolation. The biological evidence (which is independent of dating techniques) clearly shows that the site was a refuge for many species of plants and animals. When this evidence is added to the dating, it is very clear that Neanderthals lived for a long time in the ecologically-rich conditions provided outside Gorham's Cave and that the long sequence is hugely informative about their way of life.

Vanguard Cave (Figure 5) complements the Gorham's Cave Neanderthal occupation sequence, spanning the time frame 127,000-75,000 years ago, in 17m of sediment (Rhodes, 2012). This cave has a depth of 41m but may actually be deeper as the sediments currently fill the cave. Vanguard Cave has a height of 35m and a width of 35m at its entrance. In addition to the long chronology, Gorham's and Vanguard Caves represent the discovery of several aspects of Neanderthal behaviour which are ground-breaking and have no equivalent anywhere else in the world.

An intimate understanding of the ecology of the site at the time of the Neanderthals has been gained by combining the rich faunal and floral evidence from these two caves with present-day observations of the species represented. This has been done by sampling a range of sites at different bioclimatic levels across the entire Iberian Peninsula. In addition, preliminary underwater work on the now-submerged coastal shelf (emerged at the time of the Neanderthals) is providing promising results about the landscape outside the caves at the time of the Neanderthals. The full Statement of Outstanding Universal Value (OUV) is attached in Appendix 1; a complete description of all attributes which demonstrate the property's OUV is set down in the Volume 1: Nomination Dossier, section 3.1.

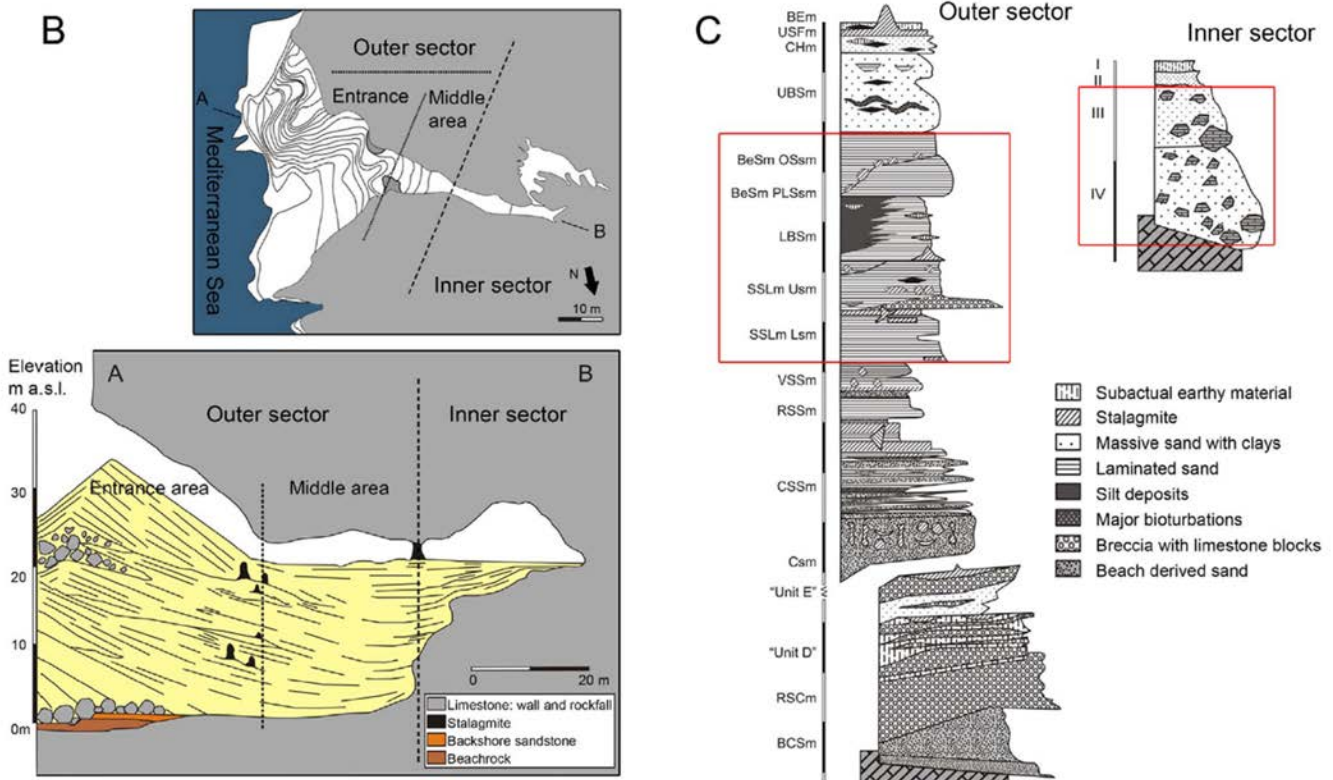


FIGURE 4 Gorham's Cave - Plan and section views including stratigraphy.

The following attributes which are deemed to confer OUV are specific to Gorham's and Vanguard Caves:

(a) Two caves - Gorham's and Vanguard - that were occupied by the Neanderthals between 127,000 and 32,000 years ago. Together, Gorham's and Vanguard Caves contain a rich archive of stone tools, remains of camp fires, bones, molluscs and pollen that permit a detailed reconstruction of climate and ecology, as well as Neanderthal behaviour, and changes through time. Gorham's and Vanguard Caves have 18- and 17-metre deep sequences respectively and thus have an extraordinarily high potential for further research. The material from the excavations includes the largest collection of fossil bird species from this period anywhere in the world (150 species). The evidence from these caves is permitting a reappraisal of Neanderthal cognitive capacities and subsistence economy. In addition to having provided the first clear evidence of abstract thinking by the Neanderthals in the form of a rock engraving, they have also demonstrated the active selection by the Neanderthals of birds of prey and crows with black feathers, hinting at previously unsuspected behaviour patterns indicative of symbolism and ornamentation. The research in Gorham's and Vanguard Caves has also revealed, for the first time, the regular exploitation of birds and marine animals for food with clear evidence of processing including cooking. Approximately 70% of the archaeological deposits at Gorham's Cave and 90% of those at Vanguard Cave remain unexcavated. The adjacent Bennett's and Hyaena Caves cover parts of the time frame of Gorham's and Vanguard Caves and therefore hold significant potential for future research; they are being left untouched in reserve.

(b) Gorham's Cave also provides evidence of the first modern humans in the area. In addition to stone tools, camp fires and palaeontological material, Gorham's Cave has revealed examples of mobile and parietal art dating back to at least 20,000 years ago.

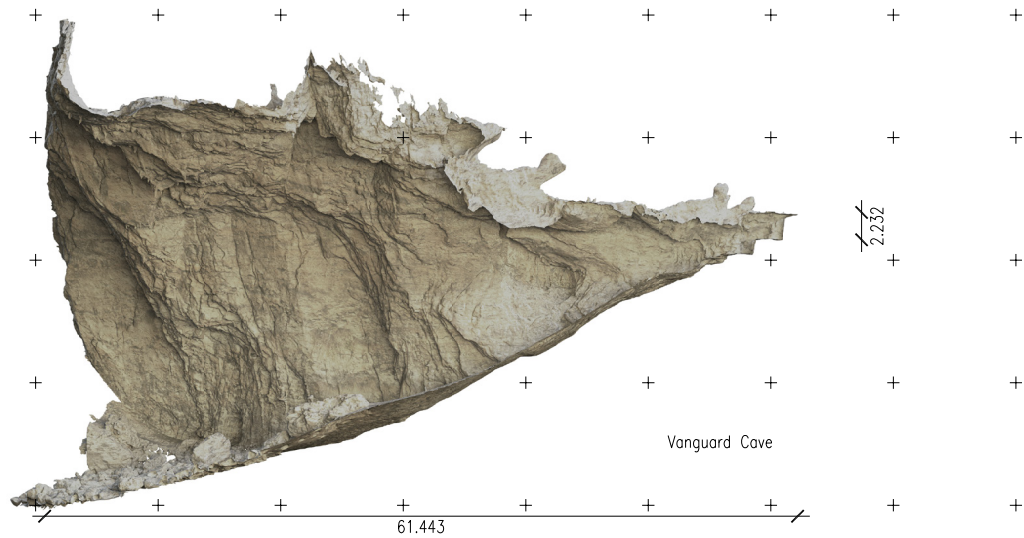
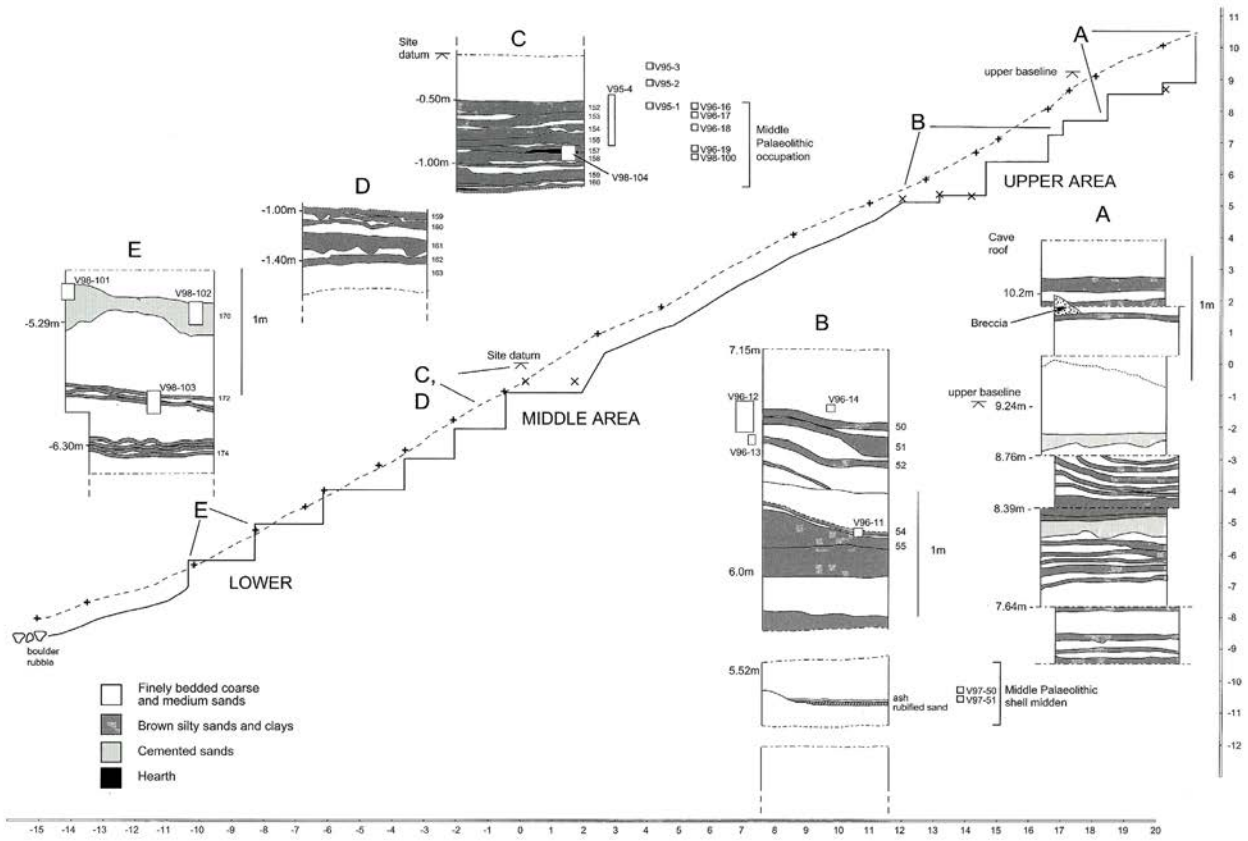


FIGURE 5 Section through Vanguard Cave showing excavated sections in Upper and Middle Areas. Below is 3-D Section of the cave along the profile of the upper diagram.

4. Brief history of excavations at Gorham's and Vanguard Caves

The research at the caves within the nominated property has to be seen in the wider context of the contribution made by Gibraltar, including the caves within the property, to the history of the study of the Neanderthals. The history of cave research in Gibraltar goes back to the 18th Century. This was the pre-Darwinian era, when a full understanding of the depth of evolutionary time was in its infancy. Work in the Gibraltar sites made a significant contribution to these early palaeontological studies, a contribution that was carried into the 19th Century when it became a major site of study for the leading palaeontologists of the day. It was then (in 1848) that the first Gibraltar Neanderthal skull was discovered, eight years before the specimen from the Neander valley in Germany.

The Reverend John White, brother of the famous Gilbert White of Selborne, was chaplain at Gibraltar during the 1770s. White collected many zoological specimens and kept detailed records, corresponding regularly with his brother and other famous zoologists of the day, in particular Thomas Pennant and Daines Barrington. White wrote a *Fauna Calpensis*, the first detailed zoological account of Gibraltar, which was sadly never published, with the manuscript now lost (Mullens, 1913). A major characteristic feature of the Rock of Gibraltar is the rich veins of breccias that date to the Middle and Late Pleistocene. Of particular significance are the Rosia bone breccias that were the subject of detailed study by White and were known to the international community of the day, being a significant feature that was discussed in the evolution debate of the time.

Great interest and excitement about the geology and prehistory of Gibraltar was generated during the 19th Century following the discovery of rich deposits of bone breccia, as well as bones and human artefacts in caves in the limestone of the peninsula. The material recovered was considered to be of such great importance that it attracted the attention of famous names of the day, in particular Sir Hugh Falconer and George Busk. On the 3rd of March, 1848, Captain Edmund Flint, secretary of the Gibraltar Scientific Society presented a human skull to this institution (Figure 6).

The skull was a fossilised human cranium found during work at Forbes's Quarry, Gibraltar (Busk, 1865; Broca, 1869; Sollas, 1907). The skull was in fact that of a Neanderthal but this was not realized until eight years later when another was found in the Neander Valley in Germany, which gave the taxon its name: "Neanderthal Man" (*Homo neanderthalensis*) (King, 1864; Keith, 1911).

Gorham's Cave, within a complex known at the time as the Monkey's Caves, was discovered in 1907 by Captain A. Gorham of the 2nd Battalion Royal Munster Fusiliers, who opened up a fissure at the back of the cavity which bears his name. Subsequently, the cavern and the system of fissures came to be known as Gorham's Cave. The cave appears to have been forgotten after 1907, although it may have been visited sporadically by military speleologists. However, on 16th March 1945, Lieutenant George Baker Alexander, R.E., a graduate geologist from Cambridge University, arrived in Gibraltar and conducted a thorough geological survey of Gibraltar, concluding with the production of a new geological map of the region (Rose and Rosenbaum, 1990). Alexander became the first person to excavate Gorham's Cave, along with his companion, Lt. Monke. Both set out to excavate a small area of the upper layer of the site. Subsequently, Professor Dorothy Garrod at Cambridge University, who had excavated Devil's Tower Rock Shelter in 1925-29, was invited to excavate Gorham's Cave. She was unable to undertake the work, and recommended Dr John d'Arcy Waechter, fellow of the British Institute of Archaeology, Ankara, to do so. Waechter's work (1951-54) represented the first large-scale excavations in Gorham's Cave (Figure 7) and established that it contained a record spanning perhaps 100,000 years of Middle Palaeolithic, Upper Palaeolithic and Holocene

occupation (Waechter, 1951 and 1964). Waechter reported the presence of ancient hearths at various levels in the cave, and of faunal material throughout the sequence, dominated by the remains of ibex, rabbit and many species of bird.

The second phase of systematic excavations was carried out by a joint team from the Natural History Museum and the British Museum, London, led by Dr Christopher Stringer, and by Ms Jill Cook, who visited Gibraltar in 1989. After preliminary excavations, the work developed as the 'Gibraltar Caves Project', jointly-directed by the Gibraltar Museum and the Natural History Museum, London (Figure 8). Work until 1997 focused on the middle section of the cave, which had previously been excavated by Waechter (1951 and 1964; and Figure 7). The excavations in the inner section of Gorham's Cave commenced in 1997; their first results were published by Finlayson *et al.* (2006). Vanguard Cave was first excavated in 1995-98 as part of the Gibraltar Caves Project (Barton, 2000) and a second phase started in 2012.



FIGURE The Gibraltar Skull from Forbes's Quarry.

6

The research at Gorham's and Vanguard Caves is at the cutting edge in this field and is making a major contribution to our understanding of Neanderthal ecology and behaviour, revealing hitherto unappreciated facts. Forty-four academic institutions from ten different countries have collaborated so far with the Gibraltar Museum in this project (Table 1). From 2002 to 2004 the project was partly funded under the EU Interreg IIIB Medocc Programme with collaborating institutions from the United Kingdom, Spain and Italy.

5. The International Research and Conservation Committee

With the inclusion of the property in the United Kingdom's Tentative List for World Heritage nomination in 2011, and the subsequent confirmation of a nomination date of January 2015, the Gibraltar Museum proposed to Her Majesty's Government of Gibraltar (HMGoG) that an independent, international committee of experts should be appointed to assess the archaeological research at Gorham's and Vanguard Caves. The intention was also to ensure a balance between excavation and conservation of deposits commensurate with the property's current status and its potential inscription as a UNESCO World Heritage Site. It was the next logical step in the protracted history of research at these sites, and necessary irrespective of inscription given the site's importance. HMGoG approved the proposal and the committee was set up in August 2013. The role of this committee was seen to include any research planned within the nominated property that had the potential to have an impact, while recognising the major significance and sensitivity of Gorham's and Vanguard Caves within the property. In addition, conservation issues pertaining to the property would also be referred to this committee, which would receive monitoring reports on all the caves within the property.

The composition of the committee, referred to as the International Research and Conservation Committee (IRCC) is at Table 2.

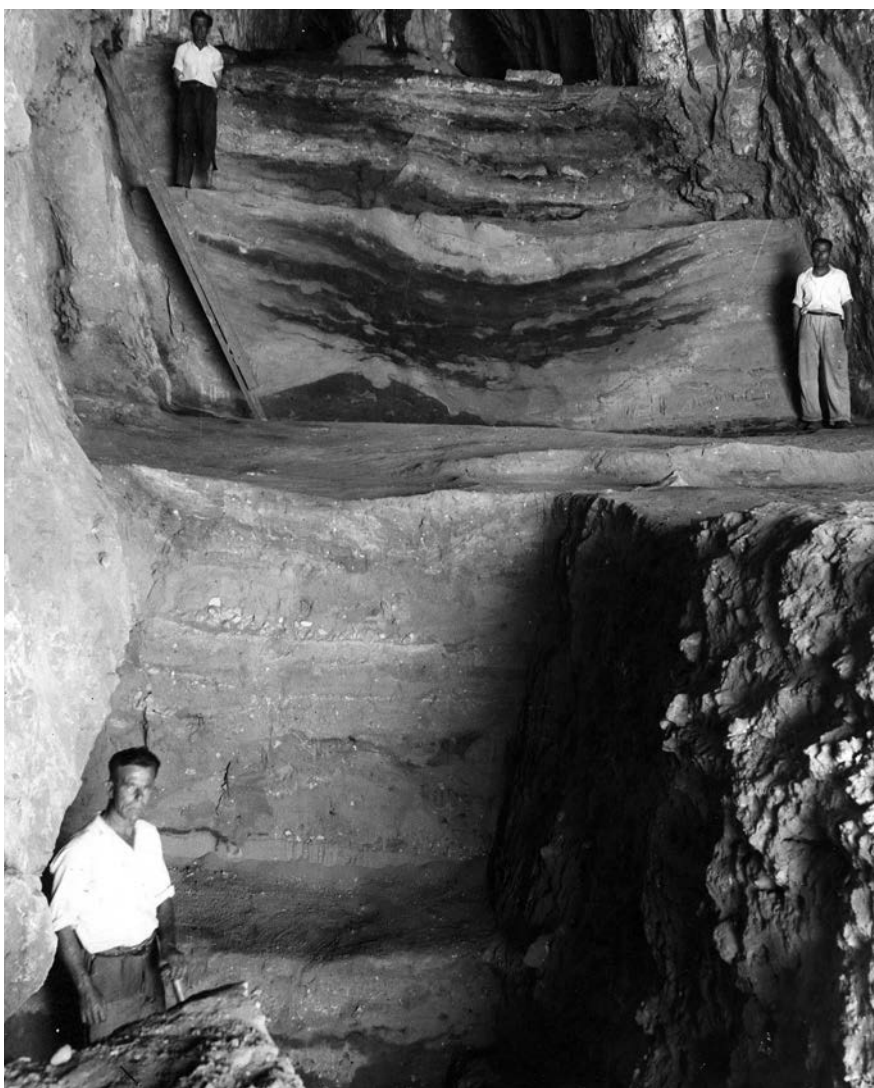


FIGURE 7 Excavations at Gorham's Cave by John d'Arcy Waechter, 1951-54. Gibraltar Museum.

TABLE 1 Institutions that have contributed to research at Gorham's and Vanguard Caves, 1989-2014 (in alphabetical order).

Anglia Ruskin University, Cambridge, United Kingdom
Australian National University, Canberra, Australia
Boston University, United States of America
Estación Biológica de Doñana (CSIC), Spain
Institut Catala de Paleontologia, Cerdanyola de Valles, Spain
Instituto Andaluz de Ciencias de la Tierra (CSIC-UGR), Granada, Spain
Instituto de Historia (CSIC), Madrid, Spain
Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan
Manchester Metropolitan University, United Kingdom
Max Planck Institute, Leipzig, Germany
McMaster University, Ontario, Canada
Museo Municipal de El Puerto Santa María, Cádiz, Spain
Museo Municipal de Villamartín, Cádiz, Spain
Museo Nacional de Ciencias Naturales (CSIC), Madrid, Spain
Muséum National d'Histoire Naturel, Paris, France
Oxford Brookes University, United Kingdom
Royal Holloway College, University of London, United Kingdom
The British Museum, London, United Kingdom
The Natural History Museum, London, United Kingdom
Universidad Autonoma, Madrid, Spain
Universidad Complutense, Madrid, Spain
Universidad de Alcalá de Henares, Spain
Universidad de Cádiz, Spain
Universidad de Córdoba, Spain
Universidad de Granada, Spain
Universidad de Huelva, Spain
Universidad de Málaga, Spain
Universidad de Murcia, Spain
Universidad de Sevilla, Spain
Universidad de Zaragoza, Spain
Universitat Rovira I Virgili, Tarragona, Spain
Université Bordeaux
Université Catholique de Louvain, Brussels, Belgium
University of California, Los Angeles, United States of America
University of Cambridge, United Kingdom
University College, Cork, Ireland
University College London, United Kingdom
University of Oxford, United Kingdom
University of Queensland, Brisbane, Australia
University of Santa Cruz, California, USA
University of Saskatchewan, Canada
University of Southampton, United Kingdom
University of Toronto, Canada
University of York, United Kingdom



FIGURE 8 Excavations at Gorham's during the second phase which commenced in 1989.

TABLE 2 Composition of the International Research and Conservation Committee for the nominated World Heritage Site.

Individual	Role	Organisation
Professor Minja Yang	Chair	President RLICC, Louvain, Belgium, and former Deputy Director at the World Heritage Centre in Paris
Professor Geoff Bailey	Member	University of York, United Kingdom
Professor Eudald Carbonell	Member	University of Tarragona and Atapuerca WH Site, Spain
Dr Juan Jose Negro	Member	Doñana Biological Station, WH Site, Spain
Professor Mina Weinstein Evron	Member	University of Haifa, Israel, and Mount Carmel WH Site
Professor Clive Finlayson	Member	Director, Gibraltar Museum and nominated World Heritage Site
Dr Geraldine Finlayson	Secretary	Director Heritage and Environmental Services, Gibraltar Museum, and nominated World Heritage Site Co-ordinator

6. Operational procedure

The current research project at Gorham's Cave, led by the Gibraltar Museum, commenced in 1989. Its focus has been a detailed investigation of Neanderthal behaviour and a comparison with modern human behaviour. In spite of almost annual excavations over the past 25 years, there has been little impact on the site in terms of loss of archaeological and palaeontological deposits. Approximately 70% of the archaeological deposits at Gorham's Cave and 90% of those at Vanguard Cave remain unexcavated. Without these excavations the Outstanding Universal Value of the site would have remained unappreciated. The excavations, as with all others carried out within Gibraltar, proceed with permission from the Minister for Heritage under the provisions of the Gibraltar Heritage Trust Act, 1989. The Director of the Gibraltar Museum has been, and will continue to be responsible for the supervision of all excavations. This has ensured that excavations have been guided by sound conservation principles.

The research strategy aims to continue excavations at Gorham's and Vanguard Caves within this long-established framework but now set within a formal strategy approved by the IRCC. In addition, an annual research programme, set within the framework of the research strategy, will be submitted to the IRCC prior to execution. The IRCC will formally notify HMGoG, through the Director of the Gibraltar Museum, in writing of its agreement to the strategy and annual research programme. The Minister for Heritage will issue an excavation licence to the Director of the Gibraltar Museum for the prescribed period, incorporating any requirements of the IRCC as necessary, once he has received the IRCC's agreement of the proposed strategy and plan of action.

Annual work plans and timetable will be produced in relation to this strategy. Data gathering methods will include intrusive (excavation) and non-intrusive surveys where applicable, and work will be carried out using existing recording, analysis and archive standards and codes of conduct. Given the environments in which investigations are carried out, health & safety considerations will be of paramount importance.

7. Research and Conservation Strategy

7.1 Guiding Principles

The Gibraltar Museum, as HM Government of Gibraltar's nominated agent for the superintendence of research, conservation and management of the property known as the GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS;

RECOGNISING the unique Outstanding Universal Value of the property known as THE GIBRALTAR NEANDERTHAL CAVES AND ENVIRONMENTS;

UNDERSTANDING the massive archaeological potential of GORHAM'S AND VANGUARD CAVES within the property to further global knowledge and understanding; and

UNDERSTANDING the need for RESPONSIBLE CONSERVATION of fragile and sensitive deposits; but at the same time

CONSIDERING the risk of medium-to long term natural erosion of archaeological deposits; and

EMBRACING the principle of the conservation of archaeological deposits for the benefit, enjoyment and study of future generations; and also

EMBRACING the need to make the knowledge gained from the site available to as wide a public as possible while ensuring the site's protection;

UNDERTAKES to implement a RESEARCH AND CONSERVATION STRATEGY in accordance with these guiding principles.

7.2 Over-arching policy objectives of the nomination

In order to maximise the site's potential and that of its attributes, taking full consideration of the need for protection, the management of the Gibraltar Neanderthal Caves and Environments site requires a long-term view. This view is guided by the following policy objectives, which also permeate the research objectives:

- (1) To safeguard the site's Outstanding Universal Value;
- (2) To foster the gathering and dissemination of scientific information about the site;
- (3) To promote awareness and understanding of the site's Outstanding Universal Value;
- (4) To welcome local people and visitors to the site at levels which it can sustain;
- (5) To provide a high quality range of educational information and services about the site;
- (6) To ensure that World Heritage Site status assists wider sustainable development objectives within Gibraltar;
- (7) To promote and support the aspirations of UNESCO in sustainable development, inter-cultural dialogue and the relief of poverty; and
- (8) To be an exemplary model for World Heritage Site Management.

7.3 Research objectives

The Research Strategy for the five-year period commencing 1 April 2015 will cover the period of nomination of the property. If inscribed, it will also include the first three years as a World Heritage Site. The strategy visualises international collaboration, building on existing links, as a key element. Sharing of knowledge and expertise in a site of this magnitude is essential and opportunities exist for the development of exchange programmes, capacity building and the development of partnerships with the private sector. Research also opens the window to improve employment, funding opportunities and to generate social benefits. These are the aspects that have been developed over the past 25 years in the site but which have the opportunity of significant expansion with World Heritage status. The strategy will be carried out within a set of rules which are set out at Appendix 2.

The gathering of scientific information about the site is the central component of the research and conservation strategy. The aim is to continue as an international, multi-disciplinary, project with a view to making it, additionally and given the scope, inter-generational. A central tenet of the strategy throughout is that there will be a balance struck between the amount of material excavated and that left untouched. That balance will ensure that representative sequences of the major depositional events are retained.

An essential component of the strategy is the involvement of the community at all levels. Volunteers participate, under supervision, in the excavation programme and in museum-related activities. At management level a Steering Group for the bid has involved all stakeholders including local non-governmental organisations.

Detailed methodology for demonstrating that the conservation principles are working will be set down, after discussion by the IRCC and partners, in 2015. A set of performance indicators for the project is set down in the Nomination Dossier (Volume 1, section 6).

The scientific investigation for this period is centred round six research objectives:

- a) Improving our understanding of the stratigraphy and chronology of the sequences at Gorham's and Vanguard Caves
- b) Furthering our knowledge of Neanderthal behavioural ecology over large timescales, using information from terrestrial and sub-marine deposits
- c) Gaining a better understanding of the use of space by Neanderthals within the caves
- d) Assessing the extent and potential of the caves' deposits
- e) Modelling quantitative ecological reconstructions by using present-day biological proxies
- f) Ensuring an effective and integrated archive, available for future researchers and for the management of the nominated project

Whilst the main focus of the strategy is on investigations within the principal caves, research will continue on two fronts away from the site but with a direct bearing on it. Underwater investigations of the submerged landscape which would have been dry land at periods of Neanderthal occupation and use will resume in 2015. The ecological reconstructions also involve an on-going project in Gibraltar and the wider area.



FIGURE 9 Detail of the stratigraphy at Vanguard Cave, June 2013.

7.3.1 Specific research objectives 2015-2019

(a) Improving our understanding of the stratigraphy and chronology of the sequences at Gorham's and Vanguard Caves

The caves' research will be carried out exclusively in Gorham's and Vanguard Caves. Other caves with known deposits surviving and research potential within the property (Bennett's, Hyaena, Martin's, Goat's Hair Twin Caves) will be conserved and no excavation will take place during the five-year period of the current strategy. Work commenced in the Upper Area of Vanguard Cave (Figure 5) in 2012. Two field seasons have been carried out as no work was done in the summer of 2014 because of works related to the World Heritage Bid. Excavations are expected to resume in the summer of 2015. This work has so far identified a high resolution stratigraphy with 16 different stratigraphic levels (Figure 9). Samples have been taken for AMS radiocarbon and OSL dating as part of collaboration with the Max Planck Institute in Leipzig, Germany. A high degree of resolution and preservation of deposits has been identified, for example desiccated ponds found within the cave and possible imprints of branches in the sand (Figure 10).

The aim is to continue the excavation down the 17m of deposits to establish a complete chronology for this cave which appears to be exclusively Middle Palaeolithic.



FIGURE 10 Detail of desiccated pond inside Vanguard Cave. June 2013.

Work in Gorham's Cave will proceed within two areas of the cave, the Middle and Inner Sections (Figures 4 and 11). The deepest part of the inner area, where a Neanderthal rock engraving was recently discovered (Figure 11) will no longer be excavated given the sensitivity of the find. It will be protected as a special area within the cave. The area, which includes the late Neanderthal level IV, is being sampled for AMS radiocarbon dating using ABOX by the Max Planck Institute to assess the dating of this level with this new technique. Sections of this level will be sampled to better understand the micro-stratigraphy. Other than for these on-going projects, of minimal intrusion, the area will not be touched.

(b) Furthering our knowledge of Neanderthal behavioural ecology over large timescales using information from terrestrial and sub-marine deposits

Gorham's and Vanguard Caves have recently provided important new information about the exploitation of birds by Neanderthals for food and for the use of their feathers. Previously, Vanguard Cave had provided significant evidence of the use of marine resources, including seals and dolphins, by the Neanderthals. It has become clear from recent work in the laboratory and also from a preliminary excavation conducted in 2013, that the Middle Area (Figure 4) of Gorham's Cave retains the best potential within the cave for examining questions related to Neanderthal resource exploitation and the use of space in the cave. The area is rich in Neanderthal hearths and provides important evidence of butchery with an abundance of lithics. It is therefore proposed that within the term of this five-year research strategy, excavation in this Middle Area will continue with this objective in mind. This is the prime area of the property that can answer questions related to the subsistence economy of the Neanderthals although future work in Vanguard Cave may also prove important in this context.

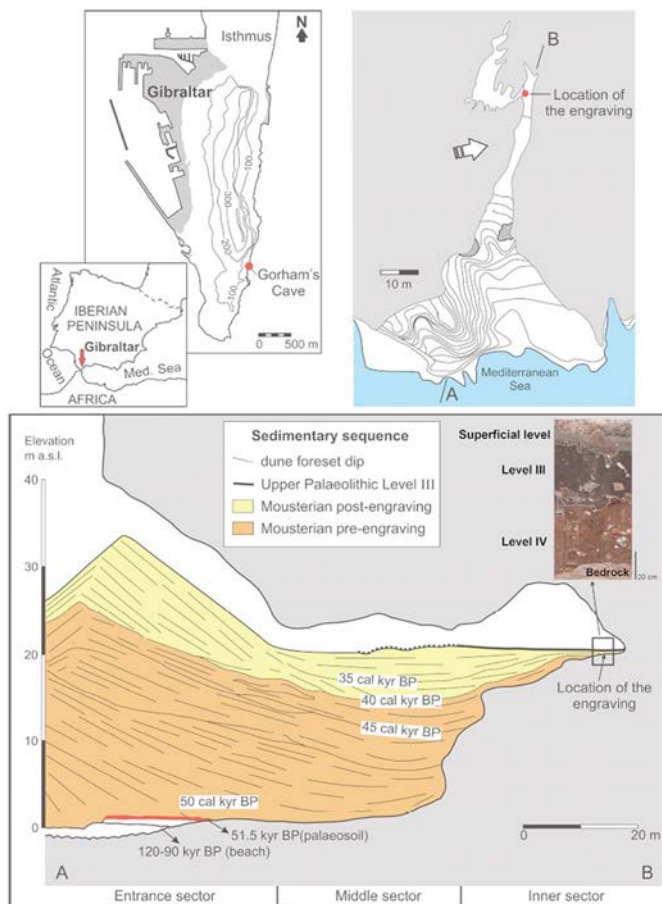


FIGURE 11 Location of Neanderthal rock engraving within the inner area of Gorham's Cave.



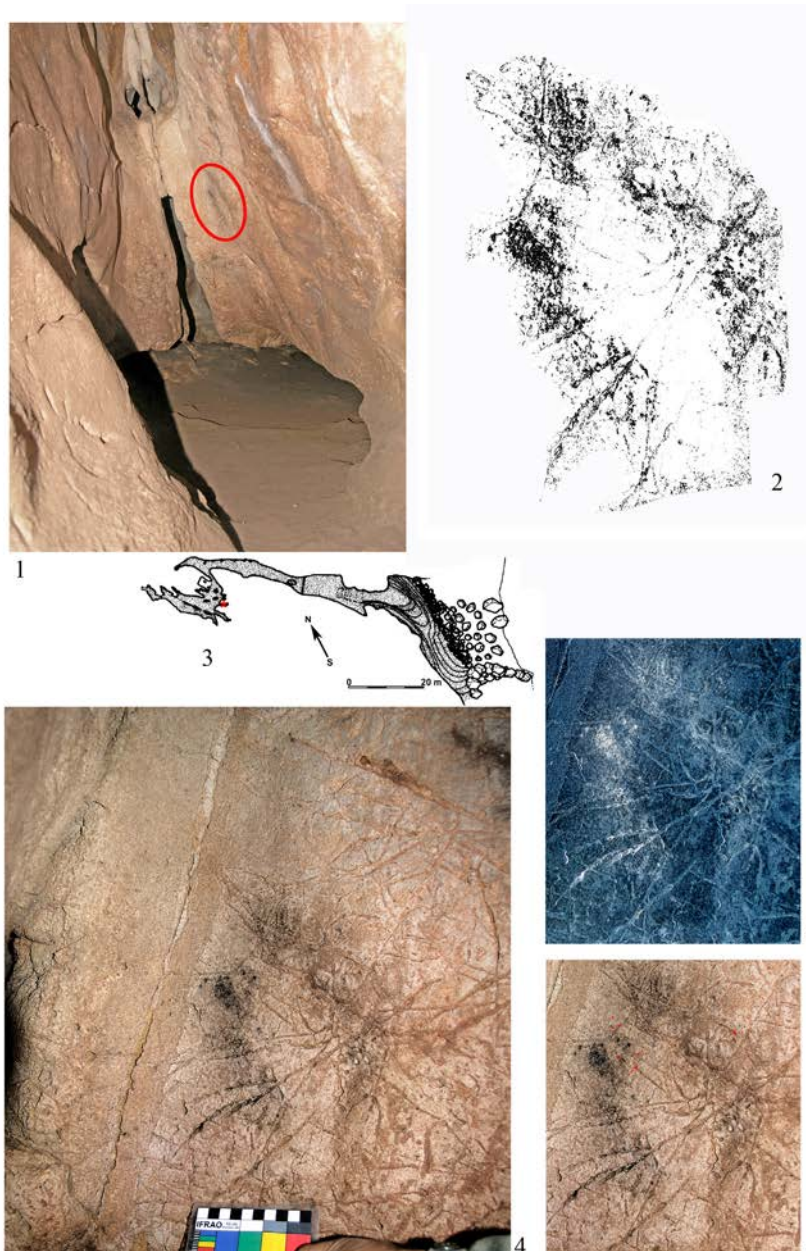
FIGURE 12 Diving operations during GIBRAMAR project

Research will also proceed on the submerged coastal shelf just off the site. The submerged shelf is known to contain potential for understanding Neanderthal behaviour and ecology and a series of submerged pinnacles and associated freshwater springs offer an opportunity for further exploration. This will also establish the potential for underwater archaeology. Surveys were conducted in 2005 under the project GIBRAMAR (Figure 12) and work is expected to resume during the period of this research and conservation strategy document.

(c) Gaining a better understanding of the use of space within the caves by Neanderthals through exploration of blocked passages, and

(d) Assessing the extent and potential of the deposits

A major challenge to be addressed during the term of current research and conservation strategy lies in Upper Area of Vanguard Cave (Figure 5) where deposits currently block what may be the opening of a large cave. The possibility of investigating via non-intrusive methods has been discussed and will be explored further ahead of the excavation option. Up to the time of the discovery of the Gorham's Cave engraving, excavations had been proceeding annually on the opening up of a large inner chamber at the back of which Upper Palaeolithic art had been discovered on the cave wall (Figure 13). This inner chamber is of difficult access and excavations had been proceeding with a view to opening up an area with a rich potential for understanding the use of space by Neanderthals. With the discovery of the Neanderthal engraving, this chamber has the greatest potential for further discoveries of this type. Given that the area of the engraving is now of restricted access, it is proposed to work on opening access via a passage that is situated to the south-east of the engraving. This work will have the added advantage of opening up further areas of Level IV for study.



**FIGURE
13**

The inner chamber of Gorham's Cave (3 in the figure) has revealed Upper Palaeolithic art dating to 20,000 years ago. 1 shows location of negative hand on charcoal with detail in 2, 4, 5 and 6.

(e) Modelling quantitative ecological reconstructions by using present-day biological proxies

Significant work has been carried out using present-day species as indicators of the ecological conditions and processes that existed outside the Neanderthal caves. This ecological work, using non-intrusive observational methods, involves habitat and species sampling within Gibraltar but also beyond (Figure 14). Work in the Doñana Biological Reserve (itself part of a UNESCO World Heritage Site) is set within a framework agreement between the Doñana Biological Station and the Gibraltar Museum.

A database of over 1000 sites has already been created and is set to expand further during the period of the research and conservation strategy covered by this document. The ultimate aim is to generate high resolution models of Neanderthal ecology using living species of vertebrates, which coexisted with the Neanderthals, as proxies.

(f) Ensuring an effective and integrated archive, available for future researchers and for the management of the nominated project

A database and archive will be maintained by the Gibraltar Museum, increasing public access where possible. The intention is that an integrated database will be developed, to include monitoring records (species and sites, condition). This will be a GIS-based tool, supported by central IT services, and accessible to all active partners. It will contain linked information including:

- Field investigation records: context records; written, graphic and photographic excavation records; artefact and specimen records; monitoring reports, visual and photographic condition surveys of deposits in caves during excavations and throughout the year.



FIGURE 14 Field sampling on the sand dunes within the Doñana National Park, SW Spain. This site is the closest proxy for the coastal habitats which existed outside Gorham's Cave at the time of the Neanderthals.

- Species and habitat inventories (annual ecological surveys, listing and mapping priority species and habitats, annual bird, reptile, faunal and floral surveys). Various techniques will be applied including visual and photographic surveys of invasive plant species, native plant repopulation, censuses of breeding bird species, bird migration counts, censuses of the wintering Crag Martin roost in Gorham's and Vanguard Caves, censuses of bat populations and surveys of plants, terrestrial invertebrate fauna and intertidal molluscs.
- Species and habitat photograph archive - as support to the research, the Gibraltar Museum has been building a unique photographic archive which includes living examples of as many of the species and habitats recorded as fossils or from fossils found in the property. The ultimate aim is to have all species represented in this archive which will be used as a key tool in interpretation and education.
- Records of features at risk within the nominated property - an annual condition survey of key attributes of Outstanding Universal Value will be conducted including fixed-point photography and a text report. Particular emphasis will be put on caves with archaeological deposits at sea level and high level.

8. Dissemination

8.1 Scientific publication

The established programme of regular publishing of scientific papers on the property will continue. There is an extensive list of papers and books already available in the public domain (Nomination Dossier Volume 1: Nomination Dossier, Bibliography), and it is considered essential to make the results of work available quickly in order to inform debate. Formal annual reports will also be produced for the IRCC, the Advisory Forum and Partners. Reports and papers will be peer-reviewed by the IRCC and others as appropriate.

8.2 Educational information and services

There is a range of educational resources and activities available, run from the Museum. These include teachers' packs, website, an education officer, activities on site, in the Museum and in schools. Activities are guided by input from teaching staff on suitability to key stage curricula. The intent is to develop and diversify the resources as new information becomes available, and to engage young people further through a wide variety of activities including, for example, through drama and dance. Educational services will also focus on less advantaged groups.

Gibraltar Museum staff regularly give local and international lectures on the nominated site, human evolution and associated subjects. The Gibraltar Museum also organises an annual international Calpe Conference, which is on the subject of Neanderthals every third year.

8.3 Promoting awareness and understanding of the site and its values

Every effort will be made to improve the provision for interpretation and access, including provision for visitors with disabilities, virtual access, children, and foreign visitors. There will be an annual review to identify changes and improvements (new view points, new information boards, new website, new discoveries). The quality of interpretation will be paramount and work to make improvements will be undertaken continuously. Quality of interpretation will include ease of access and location, standards of information and presentation. Annual visitor surveys will be carried out to assess on-site standards. The Gibraltar Museum has a programme of encouraging popular articles, newspaper articles, TV documentaries and radio programmes. Similarly, the site will continue to be promoted via social media and impact will be assessed using standard tools.

8.4 Visitation - welcoming local people and visitors to the site at levels which it can sustain

Information from new discoveries and research will be made available at key visitor locations. A detailed Visitor Management Strategy is being developed as part of the implementation of the Management Plan. Visitor numbers, potential impacts and carrying capacity are monitored, especially as the property has areas of varying sensitivity. The Gorham's Cave Complex, the most sensitive part of the property, will only be visited by prior arrangement and in limited numbers, with authority from the Director of the Gibraltar Museum. Most visits will be by sea with land access restricted.

A five-yearly review of statistics and comparison with other World Heritage Sites will be undertaken. Models of visitor impact will be explored as tools for predicting potential damage and levels of acceptable visitation.

9. Resources and Training

A World Heritage team, based at the Gibraltar Museum, initially of 15 staff including seven new posts and cross-utilisation of existing post-holders, is dedicated to developing the site at the highest research, management and educational level. Gibraltar Museum staff are given on-the-job and external training. One member of staff is currently reading for a PhD and others are pursuing different levels of distance learning First degree and Masters Level. Training is an essential component of the development of the research and conservation strategy.

10. Government commitment through funding

Her Majesty's Government of Gibraltar is fully committed to funding the project which will promote the exemplary model concept for the site. Appointment of new staff and the level of commitment to improving infrastructure and facilities clearly demonstrate this commitment.

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Appendix 1

Draft statement of Outstanding Universal Value: core statement for future monitoring

a) Brief Synthesis

The candidate World Heritage Site covers 28ha of sheer limestone cliffs, dunes and 46 caves on the east side of the Rock of Gibraltar bordering the Mediterranean Sea. Raised beaches, scree slopes and dunes provide an exceptional record of two million years of Earth history in 426m from sea level to the highest peak of the Rock. This record illustrates how land was exposed and covered by sea-level rise and fall, some caves now being partly submerged and others offshore lying in the sea bed. Exceptionally, given the abrupt relief, some caves – most notably Gorham’s and Vanguard - were not inundated by the sea and retained significant archaeological and palaeontological deposits covering the past 125,000 years. Four caves have archaeological evidence of Neanderthal occupation and four of the first modern humans. They have generated a large body of information on the way of life of the Neanderthals in favourable climatic and ecological conditions, including unique examples of the exploitation of birds and marine mammals for food. Gorham’s and Vanguard Caves have provided exceptional evidence of Neanderthal cognitive capacities, including the first and only known rock engraving and evidence of the systematic use of raptor feathers for ornamentation. The caves have been excavated systematically over 25 years but vast deposits remain intact, retaining huge potential.

Lush Mediterranean vegetation and intertidal animals - species known to have predominated at the time of the Neanderthals - continue to cover the cliffs, slopes and rocky beaches. Resident birds, present when the Neanderthals lived here, still breed within the site while many migratory species rest or fly over the site during their annual migrations between Europe and Africa. Put together, all these elements offer the most complete picture of the Neanderthal world anywhere. Importantly, there are significant components surviving to the present which provide a unique opportunity to study and interpret the Neanderthal way of life in a natural context. The subsequent presence of early modern humans offers an excellent opportunity to compare the lifestyles of two human lineages within the same eco-geographical context, a comparison that is revealing great similarities between the two lineages and that is changing our view of the abilities of the Neanderthals. This extraordinary combination provides an exceptional and vivid picture of the Neanderthals, their way of life and environment, and gives the property its Outstanding Universal Value.

b) Justification for Criteria

Criterion (iii): The site provides an exceptional testimony to the Neanderthals, a people and their cultural traditions, who are now extinct. Rock engravings, stone tools, hearths, bones with cut marks and evidence of burning, and molluscs showing fracture marks made with stone tools are the primary evidence of the Neanderthals. A rich array of fossil vertebrates (including the highest avian species diversity of any site), molluscs, pollen and charcoal provide the climatic and ecological context for Neanderthal and subsequent early modern human occupation. The enormous depth of archaeological and palaeontological deposits in Gorham’s and Vanguard Caves spans 125,000 years. An outstanding high-resolution record thus allows comparisons across a huge time span and permits analysis of stasis and change in cultural traditions. The quality of resolution allows understanding of the daily activities of the Neanderthals, including their capacities for abstract thinking. The spatial distribution of sites permits a detailed understanding of how the Neanderthals exploited their territory. The present environments of the site contain plants and bird species which shed light on this lifestyle. Our knowledge of the abilities and cultural traditions of the Neanderthals has changed decisively as a direct consequence of the evidence provided by this incomparable site.

Criterion (v): The site is of Outstanding Universal Value because its topography, geological features, natural cliff vegetation and rocky shoreline communities, afford a clear vision of a place which was once home to the Neanderthals. Nowhere is the relationship of the Neanderthals and their environment more palpable than it is in this site. It offers important features that allow us to understand and interpret the traditional lifestyle of the Neanderthals in their environment, and also to compare it to that of early modern humans. Part of this landscape was subjected to irreversible change with sea level rise 10,000 years ago; ancient raised beaches, scree slopes, shorelines and dunes within the site are reminders of the dynamic and precarious nature of a coastal world that was in a constant state of flux. The evidence in the caves enables us to understand how Neanderthals and modern humans adapted to these changes, varying their subsistence strategies as opportunities arose. The incomparable topography of the Rock of Gibraltar, as well as its modern-day flora and fauna, with many species still present from ancient times, opens up an exclusive window into the lost world of the Neanderthals.

c) Statement of Integrity

The size of the property allows the presentation of the attributes and their meaning in a full and uninterrupted context. The boundaries follow natural topographical features that incorporate the complete series of attributes that gives the site Outstanding Universal Value. The geological and archaeological attributes are exceptionally well-preserved while a significant proportion of the flora and fauna present in the Palaeolithic is still present today. In addition to their intactness, the attributes have a clear coherence within the boundaries of the property. The inclusion of a significant area surrounding the caves makes it possible to understand more fully the ways in which the Neanderthals interacted with their surroundings; it also guarantees that the nominated property is of adequate size to ensure the complete representation of the features and processes that convey its significance. Risks affecting the property are largely related to long-term climate change and sea level rise; shorter term risks with natural fires and rock falls; they are considered to be low and are closely monitored. The attributes are not threatened by development, deterioration or neglect. A combination of legal protection, active management, vertical scale and topography minimises risk to the property, which can only be appreciated if its dynamic character is fully understood.

d) Statement of Authenticity

The authenticity of the site is guaranteed by its existing attributes which convey the site's meaning. These attributes fall into three distinct categories: 1) the stratified deposits within the caves which contain a wealth of information that situates the site in a time framework are wholly authentic in material and substance. They contain engravings, artefacts, animal and plant remains that testify to the site's repeated use by Neanderthals and also by the first modern humans. 2) the form and substance of the caves themselves, their location and setting, the surrounding cliffs, their geological formations and the tangible evidence of climate and sea-level change (ancient beach levels); and 3) well-preserved relict cliff vegetation and faunal elements that have a direct connection with the vegetation that grew on these cliffs when Neanderthals and modern humans lived in the caves.

e) Requirements for Protection and Management

Ownership of the site rests with Her Majesty's Government of Gibraltar which has appointed the Gibraltar Museum, through its Director, as manager. A small section of the site is owned by the UK Ministry of Defence. All the key attributes of OUV are entirely situated within HMGoG-owned (non-leased out) land. The site has full legal protection as part of the Gibraltar Nature Reserve; individual caves are also Schedule 1 Category A (maximum protection) sites under the Gibraltar Heritage Trust Act. Additional protection is provided by the Town Planning Act. Access to fragile caves is strictly controlled, permitted only with a guide approved by the Gibraltar Museum Director. The Mediterranean Steps are open to the public and are maintained with interpretation; the relict vegetation along the cliff walk is not threatened. Wildlife is protected through the Gibraltar Nature Reserve Act. Visitor numbers to sensitive parts of the site are and will be restricted and closely-monitored. Systems of access control will be updated as technology improves. Archaeological excavations are managed to ensure no loss of site integrity. An international

committee of experts reviews relevant plans from the perspective of conservation, maintenance of site integrity and academic standards.

A Steering Committee is guiding the process of nomination; this Committee will become an Advisory Forum if the property is inscribed. Non-governmental organisations (Gibraltar Ornithological and Natural History Society; Gibraltar Heritage Trust) with site interests are directly involved in management processes. A dedicated multi-disciplinary team based at the Museum is implementing the Management Plan. Levels of resourcing, including staff levels, are reviewed annually. There will be a five-year review of the management plan and systems, legal protection and research strategies, with annual monitoring and reporting. Particular emphasis is given to risk management and to improving visitation opportunities. The general public is kept informed of work undertaken through regular lectures, press, television and social media and direct participation.

Appendix 2

Rules for the implementation of the Research and Conservation Strategy

- 1) The strategy has a strong focus on the application of explicit research questions aimed at elucidating specific research goals. Each intervention will require a specific research goal.
- 2) The research and conservation strategy has a five-year life span and will run concurrently with the nominated property's management plan. Both will be reviewed simultaneously at the end of each five-year spell. The strategy will be executed by a series of annual research and conservation action plans which will be presented in writing to the Chair of the IRCC by no later than the 30th September of the calendar year immediately preceding the calendar year in question.
- 3) The IRCC will endeavour to reply by no later than 30th November to the annual action plan.
- 4) When agreement of the annual action plan is given by the Chair of the IRCC to the Director of the Gibraltar Museum, the latter will submit a draft licence and corresponding IRCC agreement to the Minister for Heritage for the issuing of a licence under the Gibraltar Heritage Trust Act, 1989.
- 5) The Director of the Gibraltar Museum will submit a full report on the previous year's excavations to the Chair of the IRCC concurrently with the research and conservation action plan. Given the asynchrony of submission date with calendar year, this report will cover the twelve months prior to submission, starting 1 September of the previous year and ending 31 August of the year of submission.
- 6) In certain cases, the strategy may address issues that are not specifically associated with research questions but which are geared towards conservation or paving the way for research questions to be asked in the future.
- 7) No research will be undertaken that risks compromising the integrity of the property and its contents.
- 8) An impact assessment of any proposed research activity will be submitted as part of the annual action plan.
- 9) A monitoring system for all interventions will be put in place by the Director of the Gibraltar Museum and the impact of each research intervention will be assessed and will form part of the excavation report.
- 10) Whenever possible, non-intrusive methodologies will be applied to the research; where this is not possible a minimalist approach will be applied as far as possible.

- 11) In accordance with Gibraltar Law, all excavated artefacts, bones and other items will be deposited in the Gibraltar Museum.
- 12) The Gibraltar Museum will take every reasonable step to ensure the safe keeping and conservation of all items recovered from the property.
- 13) Any items recovered and required to be exported for the purposes of study will be subject to a licence by the Minister for Heritage on the advice of the Director of the Gibraltar Museum. The Director of the Gibraltar Museum shall have discretion in this regard but will report all cases in his annual report. Where the Director feels that he requires the advice of the IRCC, he will withhold his advice to the Minister until such time as he is satisfied that such advice is the best possible.
- 14) It is understood that the exportation of certain items for laboratory analysis (e.g. radio-carbon dating, stable isotope analysis) may involve the destruction of the item. In such cases the Director of the Gibraltar Museum will measure the potential information to be derived from the sample's destruction against the need for its conservation.
- 15) As far as practicable, and having due regard to questions of conservation and security, the Director of the Gibraltar Museum will endeavour to make discoveries from the property accessible to as wide a public as possible.
- 16) The Director of the Gibraltar Museum will take steps to monitor the cave climate at Gorham's and Vanguard Caves and, where possible, other caves within the property. This will include an assessment of changes related to the presence of archaeologists during excavations. A climate report will be included in the annual report.
- 17) Access to Gorham's and Vanguard Caves will be restricted. The Director of the Gibraltar Museum will monitor and record all access to Gorham's and Vanguard Caves and will provide an annual assessment of carrying capacity in the annual report.
- 18) The Director of the Gibraltar Museum will monitor access to the Goat's Hair Twin Caves which are close to a public footpath at Mediterranean Steps and have been vulnerable to graffiti in the past.
- 19) Removal of historical and contemporary graffiti in Goat's Hair Twin Caves and in Martin's Cave (now with access restricted) will be the subject of a policy to be agreed with the IRCC.
- 20) All research and other activities within the property shall be the subject of constraints imposed by the need to protect sensitive wildlife inhabiting the property, in particular bat roosts and breeding sites, Shag nesting sites, Crag Martin roosts and Peregrine Falcon nesting sites.
- 21) All activities will be carried out with due and proper regard for environmental protection generally; where appropriate an environmental protection plan will be prepared before the start of projects and all participants will be briefed on such matters before work commences.
- 22) All activities will be carried out with due and proper regard for Health and Safety in line with the existing excavation code of conduct; H&S risk assessments will be prepared for all activities and all participants will be briefed on them before the start of projects.



Gibraltar Neanderthal Caves and Environments - World Heritage Site Nomination by the United Kingdom (January 2015)

Selection of Photographs for UNESCO World Heritage Centre (at 300dpi)

<i>Id No.</i>	<i>Format</i>	<i>Caption</i>	<i>Date of photo</i>	<i>Photographer</i>	<i>Contact details copyright owner</i>	<i>Non-exclusive cession of rights</i>
Photo 1	Digital photo	View of the nominated property and buffer zone from the south-east. The sea in the foreground is the Mediterranean.	June 2007	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 2	Digital photo	View of the nominated property from the south-east showing part of the series of caves at sea level. These caves were occupied by Neanderthals for 100,000 years. The sea enters some of these. In the background is the Catalan Bay Sand Dune, within the buffer zone, and a relic of dune activity when sea levels were lower than today. On the left, the highest peak of the Rock, within the nominated property, rises to 426 metres.	May 2014	Stewart Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 3	Digital photo	View of the property and buffer zone from the Mediterranean, looking west. The caves, including Gorham's and Vanguard Caves, are clearly visible on the left. The seabird activity in the foreground reflects ecological patterns that have persisted through time since the time of the Neanderthals.	September 2014	Geraldine Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 4	Digital photo	Close-up view of the property from the sea with Gorham's Cave in the foreground and Vanguard and Hyaena caves behind. Caves with the sea now entering them are on the right. The succession of cliffs and slopes to the peak reflect important tectonic uplift episodes.	August 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 5	Digital photo	Close-up view of the property from the sea with Gorham's Cave in the foreground and Vanguard and Hyaena caves behind.	July 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes

		Caves with the sea now entering them are on the right. The succession of cliffs and slopes to the peak reflect important tectonic uplift episodes.			mail: clive.finlayson@gibmuseum.gi	
Photo 6	Digital photo	Medium distance view of the property from the sea with Gorham's Cave in the foreground and Vanguard and Hyaena caves behind. Caves with the sea now entering them are on the right. The succession of cliffs and slopes to the peak reflect important tectonic uplift episodes.	July 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 7	Digital photo	View of the four main caves constituting the Gorham's Cave Complex from the sea. Left to right: Bennett's, Gorham's, Vanguard, Hyaena.	July 2006	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 8	Digital photo	Gorham's Cave has a record of human occupation which includes a long Neanderthal sequence and the subsequent presence of modern humans. The cave was discovered in 1907 by Captain Gorham and has been the subject of archaeological research since 1989.	July 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 9	Digital photo	View of Gorham's Cave from the beach looking south. In the background are the 19 th Century Europa Advance Batteries, now viewing platforms for the nominated site.	August 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 10	Digital photo	View of the entrance of the cathedral-like Gorham's Cave looking north from a viewpoint within the nominated property.	June 2007	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 11	Digital photo	Classic view looking out from Gorham's Cave with the Mediterranean Sea as backdrop. At the time of the Neanderthals sea levels were lower and the sea was 4.5 kilometres away, exposing a sandy continental shelf.	August 2005	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 12	Digital photo	Excavations in progress in the back chamber at Gorham's Cave.	July 2013	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes

Photo 13	Digital photo	View of the beach by Gorham's Cave looking down from the access steps. The people on the beach offer an indication of the massive scale of the site. The exposed beaches include remnants of old beaches when sea levels were higher than now.	July 2013	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 14	Digital photo	The Gorham's Cave Complex and the cliffs of the nominated property rising to its highest peak at 426 metres. The view is taken from the 3 rd Europa Advance Battery, to become a viewing platform for visitors to the site.	April 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 15	Digital photo	Early morning view of the cliffs of the nominated property from the south-west, rising to the highest peak at 426 metres.	July 2014	Clive Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes
Photo 16	Digital photo	The peak of the Rock, within the nominated property, looking south towards Africa. In the background, beyond the Strait of Gibraltar, lies Jebel Musa on the North African coast. The Rock and Jebel Musa constituted the Pillars of Hercules in ancient times. The vegetation on the slopes of the Rock, within the buffer zone, includes many species known to have been present at the time of the Neanderthals.	June 2014	Stewart Finlayson, Gibraltar Museum	Clive Finlayson, Gibraltar Museum, 18-20 Bomb House Lane, Gibraltar Tel: 350 200 74289 Fax: + 350 200 79158 E-mail: clive.finlayson@gibmuseum.gi	Yes

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МЕЖДУНАРОДНЫЙ СОВЕТ ПО ВОПРОСАМ ПАМЯТНИКОВ И ДОСТОПРИМЕЧАТЕЛЬНЫХ МЕСТ

H. E. Mr Matthew Sudders
Ambassador, Permanent Delegate
Permanent Delegation of the United Kingdom of Great
Britain and Northern Ireland to UNESCO
Maison de l'UNESCO
1, rue Miollis
75732 Paris Cedex 15

Our Ref. GB/AS 1500

Charenton-le-Pont, 28 September 2015

World Heritage List 2016

Gibraltar Neanderthal Caves and Environments (United Kingdom) - Additional information

Dear Sir,

ICOMOS is currently assessing the nomination of "Gibraltar Neanderthal Caves and Environments" as a World Heritage site and an ICOMOS evaluation mission has visited the property to consider matters related to protection, management and conservation, as well as issues related to integrity and authenticity.

In order to help with our overall evaluation process, we would be grateful to receive further information to augment what has already been submitted in the nomination dossier.

Therefore we would be pleased if the State Party could consider the following points and kindly provide additional information:

Boundaries

Could the State Party explain the status of the strip of sand dune east of the buffer zone, is it included in the Gibraltar Nature Reserve? Is it included in the buffer zone?

Could the State Party clarify why the water east and south of the buffer zone is included in Town Plan zone 4, while not included in the nominated buffer zone. What are the measures in place to conserve and manage this part of the sea?

Conservation

Could the State Party explain the criteria for assessment of significance for the graffiti in some caves such as Goat's Hair Twin Caves: What is the criteria of classifying as 'historic' therefore to be kept or of no significance and will be removed? This should be illustrated by examples.

Could the State Party clarify how are the Europa Advance Batteries to become viewing platforms overlooking the main caves? There is also a need to clarify how does the present and future state of the location of the Batteries relate to earlier Moorish and Spanish fortifications on this site. How will all layers of archaeological remains be preserved?

On page 165, the nomination dossier states "This infrastructure is mainly of historical military origin and cannot realistically be moved or buried; it is part of the heritage of the Rock". Could the State Party clarify this point and illustrate it with photos and/or drawings.

Tourism

Could the State Party clarify whether one of the existing or planned visitor centers functions as the

orientation and overall introduction and narrative to the whole nominated site to assist visitors to grasp the totality of the site and to direct them to its various components. It seems from the nomination dossier that the narrative and interpretation is fragmented by the different centers and routes (e.g. Parson's Lodge, Five-million year transect, the Moorish Castle, the Gibraltar Museum, etc.).

Management

Could the State Party clarify how does the Ministry of Defence relate to the management of the site? Are there any conflicts between the defence issues on the one hand and the conservation, management and accessibility to the site on the other hand? For example are there any restrictions on photographing the site?

ICOMOS is grateful for the assistance that the State Party will provide along the evaluation process.

We look forward to your responses to these points, which will be of great help in our evaluation process.

We would be grateful if you could provide ICOMOS and the World Heritage Centre with the above information by **Monday 02 November 2015 at the latest**.

We thank you in advance for your kind cooperation.

Yours faithfully



Gwenaëlle Bourdin
Director
ICOMOS Evaluation Unit

Copy to Gibraltar Museum
 Department of the Environment
 Gibraltar Heritage Trust
 UNESCO World Heritage Centre

Boundaries 1

Could the State Party explain the status of the strip of sand dune east of the buffer zone, is it included in the Gibraltar Nature Reserve? Is it included in the buffer zone?

State Party Response

We understand this to mean the strip shown in yellow and blue on the large scale map and on Figure 1.1 of Volume 1 *et al.*

The strip to the east of the buffer zone shown in yellow is a road, low cliffs and groins, and in blue existing buildings at Both Worlds and Catalan Bay Village. The fossilized sand dune extends as far as the west side of the road only where it is contained by a wall; there is no sand dune to the east of the road, so it was not included in the buffer zone. The principal rationale for the buffer zone is to protect the attributes that are functionally important to the property and its protection, by acting as a reservoir for natural plant species and providing habitat for bird and other species regarded as part of the property's attributes. It is also established to allow for the protection of potential early archaeological sites which may be buried under the sand dune and also to provide, where appropriate, protection of important views and context.

The whole sand dune from the Ridgeline at the top of the Rock to the retaining wall along the road is included in the buffer zone and all of it is now in the designated Gibraltar Nature Reserve (shown in mid-green on Figure 1.1, Nomination Dossier Volume 1). It is protected by legislation under the Nature Act 1991 and Nature Protection Regulations 2013 *et al.* (Nomination Dossier Volume 2). This was the main rationale for the boundary of the buffer zone – that it was contiguous with the protected Nature Reserve boundary.



Photo looking south along Sir Herbert Miles Road towards the nominated property (distant cliffs). The sand dune is retained by a high wall, and there is no remnant dune to the east along the road or shoreline.

Boundaries 2

Could the State Party clarify why the water east and south of the buffer zone is included in Town Plan Zone 4, while not included in the nominated buffer zone. What measures are in place to conserve and manage this part of the sea?

State Party Response

Inclusion of the sea waters east and south of the proposed buffer zone in the nominated buffer zone was considered and was discussed with the UK's Technical Advisors. It was concluded that protection for the nominated property was adequate (below) and that there were no perceived benefits to extending the buffer zone into the sea. In addition no parallel for such an inclusion could be found.

All 2009 Town Plan Zone Maps are illustrative and include seawaters immediately adjacent to the land to varying degrees.

The sea in this area:

- Is managed by the Department of the Environment and the Gibraltar Port Authority.
- Is designated in part as a European Marine Special Area of Conservation (Nomination Dossier Volume 3, Figure 6).
- Is protected under the Marine Nature Reserve Regulations 1995, the Marine Strategy Regulations 2011, and the Marine Protection Regulations 2014, protected areas shown in Schedule 1 (Volume 2(b) of Dossier, page 436).
- Is protected from ships anchoring by a designated anchorage 2km offshore (Nomination Dossier Volume 1, Figure 3.9) – Merchant Shipping (Port State Control) Regulations 2011.
- In the event of an emergency, the Gibraltar Port Authority has a Disaster Plan and a formal agreement with the Port of Algeciras to assist in any emergencies – eg supply booms to restrict oil spills.
- Is monitored for water quality at least weekly by the Environment Department monitors water quality at least weekly.
- Is protected by the Gibraltar Development Plan general environmental policies (eg ENV22 and ENV24; Nomination Dossier Volume 2(c), page 704-6).
- Is protected by requirements for Strategic Environmental Assessment and standard Environmental Assessment for any proposals which might impact on the nominated property.
- The immediate area of the sea caves (Gorham's Complex) is monitored by a security guard 24/7, who reports any incidents to the Royal Gibraltar Police (RGP); regular checks are also made by the RGP Marine section.

Conservation 1

Could the State Party explain the criteria for assessment of significance for the graffiti in some caves such as Goat's Hair Twin Caves: what is the criteria of classifying as 'historic' therefore to be kept or of no significance and will be removed? This should be illustrated by examples.

State Party Response

The main sea caves with Neanderthal occupation – Bennett's, Gorham's, Vanguard and Hyaena Caves – are unaffected by graffiti. Those which are affected are the Goat's Hair Twin Caves which are on the publicly-accessible Mediterranean Steps walk.

All caves have been checked by an expert in rock art using UV lighting for early (Neanderthal/early modern humans) rock art – none is evident.

The over-arching criterion for assessing 'historic' graffiti is the definition of an antiquity in the Heritage Act – items over 50 years old. Any graffiti over 50 years old would therefore normally be kept; any younger would normally be removed.

However, there may be exceptions and some graffiti less than 50 years old may be retained. For example any inscriptions by George Palao (excavator of some cave sites), or possibly by military engineers undertaking repairs.

Criteria also include assessing whether removal of graffiti would have a greater adverse impact on the cave walls or ecology than leaving it (there is a huge variety of paint and sprays used; requirements for removing some could be damaging to the limestone or to wildlife).

Before any work is carried out all graffiti will be checked and considered on a one-off basis. All graffiti will be recorded before being removed. The property baseline condition photographic survey (June and July 2015) has included the graffiti, but a specific record will be made at the time.

All conservation work will be carried out by a suitably-experienced and suitably-qualified conservator.

In order to try and prevent further graffiti, signs at cave entrances are proposed to explain the importance of the caves, and there is an ongoing programme of maintenance, plus routine condition monitoring monthly as part of general site monitoring. There will be a specific detailed check once a year.

The Mission Evaluator, Professor Cooney, had the opportunity to discuss this matter at first hand with the Conservator, Manuel Jaén, during a site visit to the caves on the Mediterranean Steps walk on 19th September, and may be able to add further detail if required.

Conservation 2

Could the State Party explain how are the Europa Advance Batteries to become viewing platforms overlooking the main caves? There is also a need to clarify how does the present and future state of the location of the Batteries relate to earlier Moorish and Spanish fortifications on the site. How will all layers of archaeological remains be preserved.

State Party Response

Two viewing platforms are proposed: in 2015-6 the 1st & 2nd Batteries will be cleared of the current use as a recycling centre now that this facility has been moved to the north end of Gibraltar. The 3rd Europa Advance Battery will come into operation once its current tenants have been moved to a new site in 2017. Despite their proximity the batteries give quite different views of the nominated property and wider area. Although the 1st and 2nd Batteries are considered sufficient to view the property adequately, the inclusion of the 3rd Battery is seen as part of a continuing strategy of adding to existing facilities.

All recycling material and temporary portakabin structures will be removed, as will three small structures (see plan GNCE EAB 01-001 LR) and the site left clear as a tarmac-covered area. The surface is in good condition and will be left as is.

A general record of the site is being made during the weekly condition monitoring photographic survey of the property boundary. The site was also included in the baseline condition survey (June-July 2015). An archaeological watching brief will be carried out by the Museum's archaeological team during clearance of the site.

Once clearance is complete, a full archaeological record of the site, and structure will be made (including detailed building record as there is good stratigraphy in the walling, showing the phases of development). A condition assessment will also be made to determine the best method of repairing some of the walling/parapets.

Plans for the site were drawn up in 2014 and are attached as separate pdf files. It is proposed to construct a small two-storey office and toilet facilities along the west wall slightly north of centre. Care has been taken to ensure that this facility has no visual impact on the nominated property from the sea or from the caves themselves. Information panels are proposed along the back wall and around the sea wall of the battery, and there will be additional information in the office. The site will be accessed on foot and by car/small coach, and there is parking on site.

The construction of the office will entail excavation into the tarmac to approximately 200mm and the laying of concrete raft over an area of the building; narrow wall footings are likely to be a further 300mm deep, though details are being revised at present.

It is probable that archaeological levels or structural details relating to the later 18th and 19th century batteries have been removed. But in order to ensure that such levels are protected as far as practicable (if extant), an archaeological watching brief will be carried out during preliminary geotechnical works. The results will feed into the final design and construction. As a minimum response a further archaeological watching brief would be kept during the excavation for the raft and footings to record any subsurface remains. Preservation of remains will be *in situ* where possible. Where this is not feasible or the remains are very fragmentary, preservation will be by record. Any significant results will be published.

Site history

There is no evidence of the use of the site during the Moorish or Spanish periods, as defences at these times concentrated on the more vulnerable northern and western sides of Gibraltar. But the British considered this an important area to protect against vessels approaching from the Mediterranean and they sited cannon here from before 1720. Most surviving structural evidence (the walls) is 19th century. A more detailed description is attached as Appendix 1.

Conservation 3

On page 165 the nomination dossier states: 'This infrastructure is mainly of historical military origin and cannot be realistically moved or buried; it is part of the heritage of the Rock.' Could the State Party clarify this point and illustrate it with photos or drawings.

State Party Response

This statement was made with reference to small areas of the buffer zone.

In this context historical infrastructure' means utilities - water pipes, electrical pipes and so on, which cannot be buried due to the rock, and which sit on, for example, brick piers. It is difficult to define exact spatial areas occupied by such infrastructure, but it is limited and estimated as well under 1% of the buffer zone. Most of the area of the buffer zone and nominated property are free of such items.

Some are still in use (either military or civilian – eg there are two water supplies, one military-run, one civilian, both supplying salt water and de-salinated water). But much of this utility infrastructure is not in use and is being removed gradually.

In terms of 'Any maintenance or replacement taking account of the importance of the site', this means (i) reducing any adverse visual impacts of existing pipes and piers as far as possible (eg paint them), (ii) not installing pipes/other utilities which have an adverse visual or physical impact, (iii) removing redundant pipework/cables as far as practicable and (iv) ensuring any works do not damage any attributes of OUV and leave no detritus behind.

The counterbalance is that much of this infrastructure is part of the history and development of the Rock and its fortifications and it has been in place for some time.



The photograph shows water pipes and brick piers running down across Martin's Path near the beginning of the Mediterranean Steps walk at Jews' Gate, within the buffer zone. The steps have been provided to ease access for walkers and to protect the pipes which are still used. This is the only place on the walk where such steps are needed.

Tourism

Could the State Party clarify whether one of the existing or planned visitor centres functions as the orientation and overall introduction and narrative to the whole nominated site to assist visitors to grasp the totality of the site and to direct them to its various components. It seems from the nomination dossier that the narrative and interpretation is fragmented by the different centers and routes (eg Parson's Lodge, five million year transect, the Moorish Castle, the Gibraltar Museum etc).

State Party Response

It is important to remember in this context that Gibraltar is a small territory (roughly 5km long and 500m to 1.5km wide) and everything is close – in effect within walking distance. That does not remove the need to have a coherent, consistent and clear interpretation strategy and narrative, but it does mean that full advantage can be taken of available sites and options to explain the different attributes of the cultural and natural heritage of the property and the heritage of wider Gibraltar. In addition, many visitors to Gibraltar come on day trips, short trips from cruise liners and on repeat visits, and can be on a very tight timeframe. It is therefore thought best to ensure that there are different locations where the 'Neanderthal message' can be experienced. This will ensure that the maximum number of visitors benefit if they are unable to go to the main visitor centre. As with the Europa Advance Batteries, these facilities are considered to cover the site interpretation well, but the aim is to have them as part of a continuing strategy of adding to existing facilities.

The main interpretation centre is the Museum, which pulls together information on the Neanderthals, their environments, geology and natural history as well as being a rich source of information on the later history of the Rock. The Museum is in the heart of the City and is a focal point for visitors to Gibraltar. It is also a major location for the local community and schools' visits (both Gibraltarian and Spanish). Close to 1000 people visit the Museum in a single day during the annual open day.

There are at least two phases to the interpretation strategy:

Phase 1 (which will be in place before the nomination considered by the World Heritage Committee) comprises:

- An enhanced Museum display and interpretation on the Neanderthal heritage, including new gallery space.
- Viewing platforms with information and guides at the 1st and 2nd Europa Advance Batteries. These give good views of the sea caves and of the whole southern part of the nominated property – showing the geological sequence, topography, vegetation and the wildlife, and overlook the submerged coastal plain – the Neanderthals environments. It is a good location from which to explain about the drowned landscape, but also to look at the effects of climate change. The batteries also provide a wide vista towards the north, east and south towards Morocco. It is also important to explain the history of the batteries themselves. There will be parking, a small office and toilet facilities and there will be on-site guides to talk to visitors.
- Tours by boat, initially run through the existing Dolphin Tours operators. Viewing the property from the sea gives the best views for understanding the whole. On land the verticality of the site makes it challenging for people to appreciate the scale and nature of the site, and the inter-relationship of attributes and particular features. Boat tours also give an opportunity to see the birds and the sealife that were exploited by Neanderthals.
- Improved signage within the nominated property and its buffer zone. The main path through the nominated property is Martin's Path/the Mediterranean Steps which provide a walk for visitors to experience directly and at close quarters the environment of the Neanderthals. The narratives will focus on the natural environment and resources, as well as the geology and topography. Visitors can also enter caves which have evidence of early humans.
- People at all sites guiding visitors – the human dimension is considered important.
- Information on the whole site and options offered would be in place at all Tourist Board offices and information centres, at hotels and other visitor attractions.
- Parson's Lodge will be an additional interpretation centre with its main focus on education of young people locally and internationally. Parson's Lodge will have one dedicated person, already in post, plus the Team's Palaeolithic archaeologist who ran an education facility abroad, which provided hands-on experience,

experimental archaeology and a range of other experiences for young people. It is proposed to expand these facilities and resources at Parson's Lodge, and the site is due to open shortly after December 2015.

- Training for the 400 existing licensed guides and new guides starts 29th October.

Phase 2 includes:

- The opening of a second viewing platform on the 3rd Europa Advance Battery, currently timetabled for 2017.
- Further enhancement to the Museum as the central interpretation point once staff offices have been re-located to the Moorish Castle.
- The Castle is intended to function principally as offices for Museum staff and an archive & research centre for work on the Neanderthals, early modern humans and other aspects of the Museum's work. However, an additional benefit of this move will be to open up more areas of the Castle to visitors (currently only parts of the keep, the Tower of Homage, are accessible). This enables the Castle to be used as an additional interpretation facility for the Moorish, Spanish and British [military] history of Gibraltar.

Management

Could the State Party clarify how does the Ministry of Defence relate to the management of the site? Are there any conflicts between the defence issues on the one hand and the conservation, management and accessibility to the site on the other hand? For example are there any restrictions on photographing the site.

State Party Response

Relations with the Ministry of Defence (MOD) are very good. The Senior Officer (SO1, Commander level) has been a member of the World Heritage Site Bid Steering Group from its start, and the Defence Infrastructure Liaison Officer also now sits on the Steering Group. To date the MOD has been entirely co-operative in all matters to do with the nominated property. The Commander British Forces has taken a personal interest and has visited the Gorham's Cave Complex. He also chairs the Conservation Forum which meets at different MOD locations around the Rock; and Museum Staff are members of the Forum, working from time to time on ecological surveys.

The MOD control the access gate from Europa Advance Road (at the southern entrance to the Dudley Ward Tunnel) to the Gorham's Cave complex. Approximately 150m of the road along the cliffs to the Monkey's Cave Convalescent Hospital is in military ownership and along here, only, there are standard restrictions on photography (of the facility). This has no bearing on the conservation or management of the nominated property.

There have been no problems over access to the Gorham's Caves Complex. There is a protocol in place whereby the WH Team notifies the MOD in advance of parties visiting (including names) and of excavation dates and teams, but all WH Team Museum Staff have MOD access permits, and can visit without notice. Numbers are restricted to 20 people at any one time on MOD property, but this is advantageous in terms of protecting the caves and fragile deposits in any case, and the general security is useful. The MOD has been very flexible and helpful in opening access for Museum staff at variable times including weekends and out-of-hours.

There is no conflict between defence issues and the conservation, management and accessibility; the MOD has no adverse effect on what WH Bid team do, or on attributes of OUV. The MOD has also been very co-operative in, for example, revising its maintenance schedules to paint its buildings in a less obtrusive colour, improving the environment of the access road and improving safety. There have been no issues during the extensive conservation and renovation at the Gorham's Cave Complex over the past 12 months (cliffs stabilisation, provision of access platforms and protective matting in the caves, repairs to access steps down to the sea caves, refurbishment to Monkey's Cave Hospital). When matters are raised (for example water leakage from tunnels) they have been dealt with expeditiously.

Management – additional comment from State Party

During the ICOMOS Mission, the expert evaluator Professor Cooney had the opportunity to attend a [pre-planned] Steering Group Meeting, listen to the presentation and discussions, and then talk over matters with a range of stakeholders.

Professor Cooney had noted that the Nomination Dossier proposed to reduce the number of meetings of the Steering Group (or Advisory Forum as it would become if the Nomination were to be successful) to one per year rather than the current four, quarterly meetings. As it seems to be working well, Professor Cooney suggested that the Forum should continue to meet quarterly. This feedback and suggestion was welcomed by the WH Bid Team and quarterly meetings will continue.

Appendix 1: Conservation Q2

Gibraltar Neanderthal Caves and Environments: EUROPA ADVANCE BATTERIES

Phil Smith, Senior Guide and Site Manager, Gibraltar Museum

The Europa Advance Batteries are located along the coastal cliff-top of south-east Gibraltar, within the nominated property.

There is no evidence of their use during the Moorish or Spanish periods, as defences at these times concentrated on the more vulnerable northern and western sides. But the British considered this an important area to protect against vessels approaching from the Mediterranean and they sited cannon here from before 1720.

The batteries are roughly triangular in shape, maximising firing field and minimising potential impact. The gun platforms were constructed of roughly-shaped limestone blocks and mortar, with a low parapet around the outer edge. First and 2nd batteries were located close together on the same outcrop, with 1st battery covering south and east, and 2nd battery north. Third battery was built as a separate platform approximately 150 metres further north. Early smooth-bore cannon on the sites were as small as three- or four-pounders, but towards the end of the 1700s 18-pounders became the norm and by the mid-1800s 32-pounders were the standard armament. Around this time, a store and guard room were constructed between 1st and 2nd batteries and a 4th battery constructed 250 metres to the north (by Monkey's Cave). The largest cannon mounted here were two 64-pounder rifled-muzzle loaders, which were on 1st battery in 1885, but all guns were removed in 1889.

Europa Advance Batteries (1st and 2nd in foreground; 3rd centre left) looking north to the nominated property's sea caves. Photograph mid-19th century.



A 1906 proposal for mounting two 4-inch quick-firing guns on one of the batteries was not acted on, so the batteries remained out of use until the Second World War, when a German invasion of the Rock was feared following the fall of France in June 1940. A 6-pounder Hotchkiss gun was deployed to 2nd battery that same month, but in August was replaced by two 4-inch guns, supported by a range finder and later two searchlights, one to the north and one south. In September 1942 the battery was further strengthened with the addition of two Z Projector anti-aircraft rocket launchers, which would protect the Rock in the run up to Operation Torch, the allied invasion of North Africa, which began in November. These and one 4 inch gun were removed in 1944, with all remaining

equipment being taken away at the end of the war.

After the war, the batteries were taken over by local government and used for various purposes, with 3rd battery being used by the clay target shooting club and the area of 1st and 2nd batteries eventually becoming a recycling collection point.

Later modifications to the platforms have covered a lot of the original battery structure, but sections of the original outer wall are still visible and the gun positions for 2nd battery remain uncovered, although currently in a rather dilapidated state.



The Europa Advance Batteries from the Mediterranean Steps (north at the bottom end of the photograph). The batteries at the top are the 1st & 2nd Europa Advance where work to create viewing platforms is planned for November 2015 onwards.

The batteries (1st & 2nd, and 3rd) are both intended to become viewing platforms for the nominated property. They have the best land views of the sea cave, but also have an excellent view of the whole height of the nominated property and its tectonic units.

The recycling facility will be completely removed shortly, and a planning application will be submitted for conversion to a viewing platform. A small office for staff, with toilet facilities for visitors is proposed, along with a series of explanatory panoramic panels along the seaward edge of the site. The interpretation will include information on the nominated world heritage site and on the military history of the batteries.

Parking is available on site. All areas will be fully-recorded archaeologically before any changes, and an HIA carried out.

Plans for the 3rd Europa Advance Battery, currently a clay target shooting area, will be developed during 2016, as the shooting range is to move once new facilities are available. This is planned for 2017.

Gibraltar Neanderthal Caves and Environments (United Kingdom)

Additional Information requested by ICOMOS on the 21st December, 2015 (ICOMOS reference GB/MA 1500), arising from the ICOMOS World Heritage Panel meeting of the 28th November, 2015

Question 1 - Confirm that the property boundary presented in the nomination dossier includes not only the caves above the current sea level, but also the caves that are part of the cliffs but are now located below sea level.

State Party Response

H. M. Government of Gibraltar and the United Kingdom as State Party confirm that the property boundary extends to the base of the cliffs where morpho-tectonic Unit 5 (dated 250,000 years ago to present) meets the seabed, and includes all caves with evidence or potential evidence for Neanderthal occupation that are part of the cliffs above and below sea level.

There are 46 caves in total within the nominated property, of which 28 are at the base of the southern peak of the Rock between sea level and +60m AOD in the 'Gorham's Cave Complex' (Nomination Dossier Volume 1, page 24). These would have been occupied or visited by Neanderthals as they have similar topographic characteristics and are close to the sea caves with exceptional extant archaeological deposits. The submerged and part-submerged caves (one and 11 respectively) are listed in Table 2.1 of the Nomination Dossier (Volume 1, page 23), and discussed briefly on pages 24-5.

There are very eroded sea caves to the north of the Property (between the Eastside/Ammunition Jetty and the exit to the Dudley Ward Tunnel approximately), but these are tectonic breccia caves (in effect hollows in the breccia) dating to the last glacial maximum, c 20,000 BP and hence post-date Neanderthal occupation of the area.

Question 2 - Strengthen the protection provided by the buffer zone by expanding the eastern extent to include further sea waters immediately adjacent to the nominated property.

State Party Response

As requested, H. M. Government of Gibraltar has extended the eastern buffer zone to include sea waters immediately adjacent to the Nominated Property. The extension of the buffer zone out to sea by approximately 300 metres will have the effect of providing extra protection for the OUV and attributes of the property. The buffer zone now extends out to sea to the edge of the Town Plan Zones, so the same principles apply to the sea as to land (see also response to Question 5). Existing protected area boundaries (Town Plan Zones and the Marine Special Area of Conservation) have been used to derive the new boundary for the buffer zone. This revision extends the buffer zone to include approximately 300 metres width of sea waters. This new boundary is also approximately coincident with the -10 metre contour (Nomination Dossier, Volume 1, Figure 2.20).

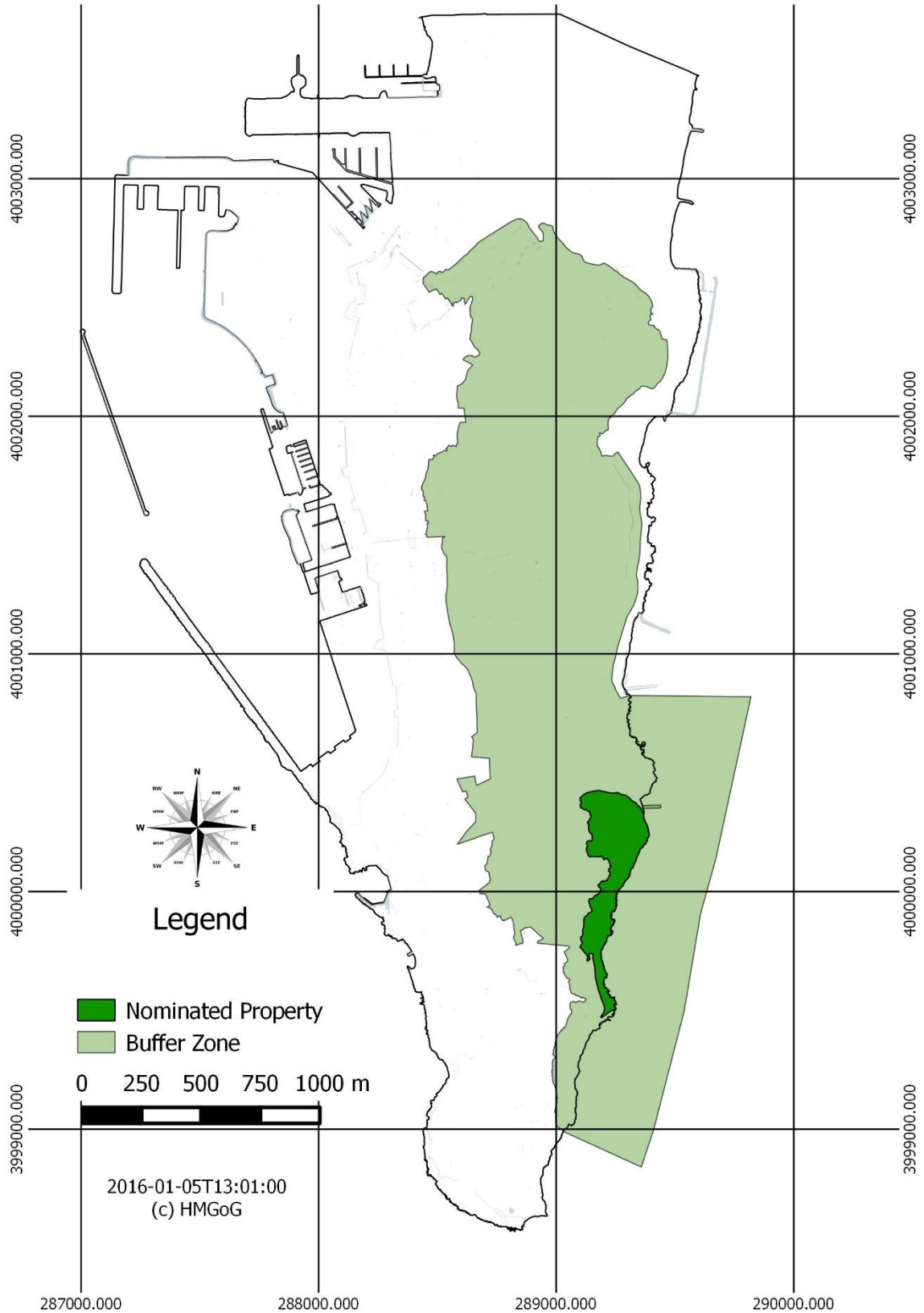
The northern edge now of the sea buffer zone runs from where the land buffer zone boundary reaches the sea to the eastern boundary of Town Plan Zone 4 (Eastside). This line is also the northern boundary of the Marine Special Area of Conservation (Nomination Dossier, Volume 1, Figure 2.53).

The eastern edge of the new buffer zone now coincides with the eastern seaward boundary of Town Plan Zones 4 (Eastside) and 7 (Europa). **Note** that these Town Plan Zone boundaries were revised and extended out by the Gibraltar Planning Department after the Nomination was submitted and are larger (ie further out to sea) than those shown in the Nomination Dossier, Volume 1, Figure 4.4.

The southern edge of the buffer zone extends seawards from where the land boundary of the buffer zone meets the sea to the edge of the Town Plan Zone 7.

This map will be the revised official large-scale map of the Nominated Property, and a full-size version (including key features as shown in Volume 1, Figure 1.1) will be forwarded to UNESCO as soon as we are informed that ICOMOS accepts the proposed expansion of the buffer zone to include the sea.

GIBRALTAR
Nominated property and buffer zone
EPSG:25830 - ETRS89 / UTM zone 30N



Question 3 - Consider the preparation of a detailed five year archaeological research strategy to assist the annual reviews by the International Research and Conservation Committee to ensure a sufficient balance between excavation processes and conservation needs at Gorham's and Vanguard Caves and provide a timetable for its implementation.

State Party Response

Volume 4 of the Nomination Dossier submitted in January 2015 is the over-arching Research and Conservation Strategy developed in 2014-5. Volume 4 as submitted contains the context, guiding principles, outline operating procedures, and a set of objectives for a five-year programme of archaeological investigation.

A draft of Volume 4 was approved for submission as part of the full Nomination by the World Heritage Bid Steering Group in December 2014. This Strategy was formally approved and adopted by the International Research and Conservation Committee (IRCC) in March 2015.

The Volume 4 Strategy does not detail archaeological excavation/post-excavation analysis methodology, as it is considered that such detail is more appropriate to an 'action plan'. Nor did it set out an indicator for monitoring the balance between research and conservation. The development of this indicator was intended to be completed within the five-year period of the strategy (see Nomination Dossier, Volume 3 Management Plan, page 97, Indicator 5, last 'Measurement Method').

We now attach a detailed five-year 'Action Plan', which is a new Appendix to Volume 4, and which describes the detailed methodology to be used in the cave investigations in the period 2016 to 2020. The Action Plan also sets out an indicator for measuring the balance between research excavation and conservation of deposits. This document is intended to assist the IRCC in its annual reviews and more general advisory role, as the ICOMOS Panel suggested. The Action Plan has been agreed by the excavation co-directors and ratified by the IRCC.

The key points to note are:

- In order to ensure a proper balance between research and conservation, the Action Plan quantifies the volume of extant resources (sediments and deposits) as currently understood and proposes a maximum volume for removal during the five-year period of 0.082% of the Palaeolithic deposits at Gorham's and Vanguard Caves combined and 0.081% of all the Palaeolithic deposits within the property. At least 50% of each identified archaeological level will be retained *in situ*, with sections through the deposits left standing for future reference. It should be noted that the current volume of deposits, on which the calculations are based, is likely to be an underestimate as the full extent of the deposits is not known in detail. This means that the proportion of deposit to be removed is likely to be even less than estimated but it is considered preferable to err on the side of caution.
- The risk to the attributes of OUV from the research investigations (Volume 3 Management Plan, Appendix 2) has been re-evaluated in the attached Action Plan (Risk Assessment and Scale of Impact, page 4) in the light of these specific excavation proposals. The risk is now considered to be 'Low' rather than 'Medium': whilst the excavations are certain to occur, the severity of impact is minimal and there will be a clear positive benefit in terms of information on the Neanderthals gained and understanding of their behaviour and environments enhanced.
- This quantified approach is the proposed indicator for ensuring an appropriate balance between excavation and conservation. It will be monitored by the co-directors and reviewed annually by the International Research and Conservation Committee.
- An annual programme of investigation is proposed, commencing June 2016. There is, and will continue to be, a rolling programme of post-excavation assessment and analysis, and publication. The publication strategy will continue with scientific articles in appropriate academic journals and monographs, and this will be supplemented by the development of popular science books including a series for children. These will be supplemented by regular public lectures and the web site.

- The research work will be monitored by the excavation co-directors (listed in the Action Plan) and by the IRCC. Specific areas of responsibility are set down in the Action Plan. The effectiveness of the indicators for assessing the balance between research and conservation will be reviewed annually. The World Heritage Bid Steering Group will be kept informed of the results of indicator monitoring.

In the context of the research programme, the project's rich publication record in high impact journals over a sustained period is an indication of the importance of the continuing research activity within the site. The aim is to sustain this high quality publication record into the future. In doing so, it is anticipated that the site will gain even further through our knowledge of its values. This long-term, inter-generational, research potential is very much a key feature of the site's values and one which will guarantee it high profile scientific status for many years to come. In this context, the parallel application of a conservation strategy for the deposits and other attributes of OUV, as outlined here, presents the unique opportunity of making this an exemplary site which could become the norm for future nominations of this type.

Question 4 - Further explain measures that will be taken to establish and communicate clear requirements for the long-term retention of some areas of the archaeological deposits within Gorham's and Vanguard Caves as part of the longer-term management, research and conservation planning for the property.

State Party Response

The retention of areas of archaeological deposits in the longer term is absolutely fundamental to the safeguarding of the Nominated Property's Outstanding Universal Value and conservation of attributes which carry that OUV. H. M. Government of Gibraltar is clear on its responsibilities and has made public commitments to fulfil those responsibilities (in the Nomination Dossier, in stakeholder meetings and in the press). Substantial capital investment has been made in conservation measures (eg access platforms to protect archaeological deposits, cliff stabilisation, security gates and so on).

The requirements so far identified are:

- To retain a minimum of 99% of known archaeological deposits after 100 years of scientific investigation.
- To restrict the removal of archaeological deposits during five-year cycles of annual excavations in Gorham's and Vanguard Caves to a maximum of 0.081% of all the known Palaeolithic deposits within the property (0.082% of known deposits in Gorham's and Vanguard Caves). [The probability is that the estimated volume of Palaeolithic deposits in Vanguard is significantly underestimated as the full shape and depth of the cave is not yet known.]
- To retain *in situ* at least 50% of each archaeological level investigated.
- To ensure that the archaeological and conservation strategy and its implementation are scrutinised and agreed by an independent committee of international experts.
- To ensure that all archaeological investigations are carried out by ethically and to agreed professional standards by appropriately experienced and qualified staff, and to ensure the training and development of newer staff and volunteers.
- To ensure that the partnership approach (of multinational institutions and specialists from multiple disciplines) continues and the project benefits from the knowledge and expertise of as wide a range of experts as possible.
- To maximise data retrieval and enhance current understanding of the behaviour of the Neanderthals, by question-driven selective investigation (agreed by an independent committee of international experts)
- Regular, robust annual review of the balance of volume of material removed against conservation of deposits and knowledge gained, by the project team and the independent experts.
- Regular, robust review of the efficacy of protective measures already installed.
- Regular monitoring of the condition of deposits, caves and all attributes of OUV.
- [This review will include the evaluation of the physical condition of the deposits which are conserved and ensuring that the attributes of OUV are not adversely affected to an unacceptable extent. It will include an analysis of the impacts of visitors and the efforts to present the nominated property to the wider public.]

- To review and set down the results in a revised conservation plan after two years, if the International Research and Conservation Committee consider this appropriate.

The communications strategy is:

- To ensure that all directly-involved stakeholders (the Steering Group, associated departments, partners) have sufficient information to carry out their roles and monitoring through the provision of regular reports, information documents, departmental briefings and presentations at meetings.
- To encourage debate on matters raised and to listen to ideas, experts and the local community.
- To ensure regular and appropriate publication of results of the investigation works as soon as practicable, in peer-reviewed scientific media and through a range of scientific conferences and lectures.
- To ensure regular publication of results in a wide range of local and international popular media, via the internet and virtual reality experiences, community lectures to local societies and organisations, schools and university meetings.
- To offer programmes for young people on natural and cultural heritage matters, including workshops and practical archaeological experience, talks and participation in the investigations
- To provide of up to date information at key visitor locations, including the Gibraltar Museum, viewing platforms and selected points within and without the nominated property.
- To survey visitors and the local community regularly to test the effectiveness of the communications strategy.

Question 5 - Provide additional detail about the mechanisms that will be used to ensure the visual integrity of the property as seen from the sea.

State Party Response

The principal mechanism for protecting the visual integrity of the Property is the Planning System which takes account of the other protective legislation including the Nature Acts, the 1989 Heritage Act and Marine Protection Acts.

All potential developments, repairs, signage, etc., have to have planning permits, including proposals by the World Heritage Team. Applications are scrutinised by relevant Government Departments including Heritage and Environment, by a series of statutory consultees including the Gibraltar Heritage Trust. Applications are also subject to public consultation and any member of the public may present comments, positive or negative. Decisions are made by the Development and Planning Commission normally in open meeting (minor proposals, such as shop signs, are sometimes delegated to a sub-committee), and there is an appeals system which is chaired by an independent Minister.

Environmental Assessment Regulations stipulate that applications which might affect sensitive sites must be accompanied by a full environmental impact assessment. Heritage Impact Assessments will be required in cases where proposed development/other activity has the potential to impact adversely on OUV.

The Town Planner has been an active and supportive member of the World Heritage Site Bid Steering Group and the Executive Management Group from the outset, and is fully aware of the responsibilities to safeguard the site. The Town Planner has facilitated access to the new online system of planning applications for the WHS Team, which is now in effect a statutory consultee.

Potential developers are advised by the Planning Department to consult the World Heritage Team at an early stage of any proposals, and this has been carried out for land-based proposals to the north. The whole property is in the protected Nature Reserve, and no development would normally be allowed, except proposals for enhancing visitor facilities (as outlined in the Nomination) or for health and safety (eg cliff stabilisation).

The buffer zone now extends out to sea by approximately 300 metres, to the edge of the Town Plan Zones, so the same principles apply to the sea as to land.

The Environment Department is responsible for enforcing the Marine Protection legislation and regulations, and the Nature Reserve Act. This department has powers to include planning conditions on proposals.

The sea adjacent to the property is a Marine Special Area of Conservation (and is now also in the nominated site's buffer zone), so no proposals which impact adversely on the sea/seabed can be implemented. This protects against potential developments such as wind farms (which would be unlikely in any case). There is in place an agreed strategy with the Ministry of Defence for reducing the visual impact of buildings within Property by re-painting visible buildings in a suitable shade of paint which blends in with the cliffs. The refurbishment of Monkey's Hospital is used as a benchmark.

The general setting of the nominated property to the south (along Europa Advance Road) has been improved by the removal of redundant plant (incinerator), new planting regimes using native species and regular cleaning of the cliffs.

Question 6 - Clarify the reasons why Ibex Cave was not included in the nominated property.

State Party Response

Ibex Cave is situated at the base of the cliff which forms the ridgeline of the Rock at the top of the Catalan Bay Sand Dune, roughly in the centre of the Dune. It is in the nominated buffer zone (Nomination Dossier Volume 1, Figure 1.1).

The 'cave' is better described as a small rock shelter which is located at the highest point of the dune where it meets the cliff; it is c 1 metre high and <1 metre deep, and was accidentally discovered in 1985. It was subsequently excavated archaeologically in 1994 (Volume 1, Figure 2.28). The excavations revealed the site was used by the Neanderthals for butchering ibex, before carrying the meat down to the sea caves.

Ibex Cave was not included in the nominated property because at present it represents an isolated site with very little archaeological deposit. Its inclusion would not add to the property's OUV; and its location, away from the 'community' of caves with significant extant deposits at the heart of the property, would present difficulties in terms of its integration (in terms of presentation and overall coherence) within the current property. Protection of the site is guaranteed by appropriate legislation and its location within the Buffer Zone.

Question 7 - Provide an update on the detailed archaeological and conditions surveys of buildings which was due to be completed by the end of 2015. ICOMOS would be pleased to receive a copy of the report once it is completed.

State Party Response

A copy of the archaeological and conditions surveys of buildings within the Property as cited in the Nomination Dossier is attached.

Volume 4, Appendix 2: Archaeological Excavation Action Plan 2016-2020

1 Introduction

This Action Plan should be read in conjunction with the main text of Volume 4 of the Nomination Dossier (Research and Conservation Strategy). It details the work that will be undertaken in the period 2016-2020 in order to meet the research objectives set out in Volume 4, Section 7.3. It focuses on the methodology to be applied in the context of maximising the research potential of the caves while ensuring the long-term conservation of significant deposits to be available for future generations of researchers. It gives a formal structure to the implementation of a philosophy which has been paramount from the very beginning of excavations at the site in 1989 by the team under the direction of the Gibraltar Museum: *To maximise the information retrieved from the deposits within the caves using a targeted approach based on specific and clear scientific questions, framed within a wider scientific paradigm, while ensuring that the minimum amount of deposit is disturbed to answer the research questions. In doing so, the highest regard will be placed on the conservation of significant volumes of deposits in situ for the future while taking into account potential loss through natural erosion.*

From the very outset, the caves have been treated as natural laboratories. Wherever possible, the latest techniques have been applied for such areas as dating, micro-analysis of sediments and residues. The detailed and thorough manner with which the materials have been retrieved is reflected in the range of high quality scientific publications which have resulted from the work. These have included, for example, detailed taphonomic analysis of bird bones, growth rings in intertidal molluscs or pollen in hyaena coprolites; these all testify to the high level of conservation of micro-elements within the deposits, reflecting the unique preservation qualities of the sites and also of the methods of retrieval. Underlying this philosophy and approach is the active development of partnerships with cutting edge international scientific institutions that allows the participation of leading world specialists and their laboratories in this project (Nomination Dossier Volume 1, Appendix 3).

The Plan has been prepared with reference to professional standards and guidance including those promoted by the United Kingdom's Chartered Institute for Archaeologists and by Historic England.

2 The Team

For the period 2016-2020, the direction of the project will continue under the Gibraltar Museum with a licence under the Gibraltar Heritage Act 1989 issued by H. M. Government of Gibraltar's Minister for Heritage. Overall responsibility rests with the Director of the Gibraltar Museum, Professor Clive Finlayson, a biologist who has been directing the project since its commencement in 1989. He has an established international professional team co-directing the excavations and the team will remain in place for at least the period of this Action Plan. The Co-Directors are divided into two categories. Chief Co-Directors have been selected because of their professional credentials, experience and long-term involvement in the project. Associate Co-Directors have been selected because of their professional credentials and experience; they include young but experienced persons who are expected to take over the project once the Chief Co-Directors retire, and who have been directing aspects of the project on the ground for a number of years. They also include specialists who contribute to covering the wide range of disciplines required in a project of this magnitude. The specializations and affiliations of the Chief Co-Directors and Associate Co-Directors are detailed in Table 1.

Table 1. Details of Project Co-Directors

Name	Institution	Discipline
<i>Chief Co-Directors</i>		
Professor Clive Finlayson, MBE, DPhil, MAE, FLS	Director and Chief Scientist, The Gibraltar Museum and Member of the <i>Academia Europaea</i>	Evolutionary Ecology, Human Evolution, Stratigraphy, Project Management, Cultural Heritage Management and Conservation, Collections Management
Dr Geraldine Finlayson, GA, PhD	Managing Director, The Gibraltar Museum, and Director Underwater Research Unit	Biogeography, Underwater Archaeology, Stratigraphy, Project Management, Cultural Heritage Management and Conservation, Collections Management
Mr Francisco Giles Pacheco	Emeritus member of Project Team	Palaeolithic Archaeology
Professor Joaquín Rodríguez Vidal, PhD	Head of Department of Geodynamics and Palaeontology, University of Huelva, Spain	Geomorphology, Palaeontology, Stratigraphy, Dating Techniques
<i>Associate Co-Directors</i>		
Dr Ruth Blasco López, PhD	Centro Nacional de Investigación sobre la Evolución Humana, Burgos, Spain	Zooarchaeology, Stratigraphy
Ms Susan Davies, OBE, BA, FSA, HonMCIfA	Head of Cultural Heritage Department, The Gibraltar Museum	Cultural Heritage and Conservation Management; Archaeological Standards Monitoring
Professor José Sebastian Carrión, PhD	Head of Department of Plant Biology, Universidad de Murcia, Spain	Palynology, Palaeoecology; Evolutionary Plant Biology, Stratigraphy
Dr Darren A. Fa, PhD	Academic Director, University of Gibraltar	Marine Biology
Mr Stewart Finlayson	Head of Natural History Department, The Gibraltar Museum and Department of Life Sciences, Anglia Ruskin University, Cambridge, United Kingdom	Conservation Biology, Palaeoecology
Mr Francisco Giles Guzman	Senior Archaeologist, The Gibraltar Museum	Palaeolithic Archaeology, Stratigraphy and site records, Post-excavation Assessment and Analysis; Collections and Archive Management
Mr José María Gutierrez López	Director, Museo de Villamartín, Cádiz, Spain	Palaeolithic Archaeology, Stratigraphy
Dr Richard Jennings, PhD	School of Archaeology, University of Oxford, United Kingdom	Palaeolithic Archaeology, Geographical Information Systems, Heritage Management and Conservation
Dr Jordi Rosell Ardevol, PhD	Istitut Catala de Paleoecologia Humans i Evolucio, Universitat Rovira I Virgili, Tarragona, Spain	Zooarchaeology, Stratigraphy

The Chief Co-Directors will meet once a quarter. Associate Co-Directors will be invited to these meetings but it is understood that all may not be able to attend. In such cases any specific questions arising will be discussed with the Associate Co-Directors, as pertinent, via Skype. All Co-Directors participating in excavation will meet beforehand to confirm all practices and arrangements.

The quarterly meeting of Co-Directors will review all aspects of the Research and Conservation Strategy and the Action Plan and will approve the Annual Report to be submitted to the International Research and Conservation Committee (IRCC, Volume 4, Section 5). The Annual Report will be submitted a minimum of three months before the commencement of the next annual excavations. The Co-Directors will review the response from the IRCC and will implement their specific excavation recommendations during the annual excavations. Other recommendations will be implemented as soon as practicable.

The annual excavations will normally be staffed by a team of between six and ten excavators in addition to the Co-Directors and supervisors. Where practicable, volunteers from the local community will also be offered the opportunity to participate in the excavations and processing works.

3 The Sites: investigation and conservation strategy

The four sea caves and the rich archive of Neanderthal material (including palaeo-environmental remains) are the main attribute which gives the nominated property its Outstanding Universal Value (OUV). The research work carried out over the last 26 years has provided new and unique insights into the world of the Neanderthals, their environments and behaviour, as well as insights into climate change. Such research could itself be regarded as an attribute of OUV (though it was not formally included in the Nomination Dossier); without it the significance of the site would be unknown. It is therefore of paramount importance that the caves and their deposits are protected and conserved, and also that the research itself is carried on to gain a greater understanding of this crucial period in the human story. But the latter must be at a level that does not destroy the attributes or the site's OUV. As a basic principle, it is expected that no more than 0.06% of archaeological levels will be removed in Gorham's Cave and 0.75% in Vanguard Cave during the period 2016-2020 (Table 2); at least 50% of each archaeological horizon will be preserved. A full profile of all levels will be preserved for future reference. Archaeological investigations will also continue to use a 'whole-earth' excavation and recovery strategy (collection and processing of entire sediment), and an unprocessed sample of all levels will be retained as part of the archive (see Methodology section below).

Excavations will only be undertaken in Gorham's and Vanguard Caves (Volume 4, Section 7.3.1 a). All other sites will be kept in reserve and will not be excavated during the period of this Action Plan (Table 2).

Gorham's Cave has an estimated minimum volume of ~80,000 m³ of deposits. It is estimated that approximately 95% of the deposits contain archaeological and palaeo-environmental material of Middle Palaeolithic, Neanderthal date (~76,000 m³); the remaining 5% contain material dating to the Upper Palaeolithic or later.

The nature of deposits in Vanguard Cave is different, containing significant amounts of Aeolian (wind-blown deposits). The *minimum* estimate for the extant volume of deposits is of ~12,200 m³. The 17-metre deep sequence is entirely Middle Palaeolithic Neanderthal. But it is likely that the volume is substantially underestimated as the full extent of the deposits remains to be determined. Within the Vanguard sequence there are layers of natural, wind-blown, sand which are sterile in terms of archaeological or palaeo-environmental material and which may be removed more rapidly.

The deposits in both caves are in a good state of conservation. The deposits in Gorham's Cave have been given additional protection in 2015, by the installation of defined access paths and access steps and a platform which sits above archaeological layers. The platform base has removable panels to facilitate excavations as needed. These features provide better access for both researchers and for visitors while preventing erosion. The Neanderthal engraving and deposits at the back of the cave, first reported in 2014,

have also been protected by the installation of a security gate. Access to the archaeological levels at the back of Vanguard Cave has been facilitated by the installation of protective matting to prevent erosion of fragile sand deposits during excavations.

The total volume of sediment expected to be removed by research excavation in the period 2016-2020 is 35 m³ from Gorham's Cave and 40 m³ from Vanguard Cave, approximately seven and eight cubic metres per year respectively. In the case of Vanguard Cave it should be noted that the entire volume of deposits is probably currently underestimated on account of a lack of information on the extent of the chamber at the back of the cave. Judging by the estimated volume of deposit in the sister cave – Gorham's – the additional volume may be significant. For the purposes of this plan, a conservative approach has been taken.

Therefore, the research excavations 2016-2020 will only take out 0.082% of the Palaeolithic deposits at Gorham's and Vanguard Caves combined and 0.081% of all the Palaeolithic deposits within the property (Table 3). It should be noted that at least 50% of each archaeological horizon will be left untouched except in exceptional circumstances, and only after approval from the IRCC. This can be easily estimated as each section is uncovered and its potential extent estimated from that of the level immediately above it. As the cave behaves like a cone, the lower the deposit the greater its surface area, thereby always erring on the side of caution.

But, excavations are, by their very nature, unpredictable, and decisions may sometimes have to be taken to modify the excavation plan. Such modifications might be caused by, for example, exceptional and/or unforeseen discoveries or to preserve sediments (e.g. to prevent a profile collapse), or for Health and Safety reasons. Therefore, an exceptional upper limit – a contingency – has been set for Gorham's and Vanguard Caves for additional excavation not needing prior approval from the IRCC. This upper limit raises the volume of potential material to be excavated from Gorham's Cave to 48 m³ in five years and the equivalent at Vanguard to 91.5 m³ in five years. These upper limits represent 0.06% of the Palaeolithic deposits at Gorham's Cave and 0.75% of those in Vanguard Cave. In all cases falling between the estimated volume to be excavated and the upper limit permissible without prior approval, a detailed report will be prepared explaining the reasons why the actions were undertaken. To emphasize the point, at this upper rate of excavation, it would take around 5,000 years to fully excavate Gorham's Cave and almost 670 years to fully excavate the present knowledge of the extent of the deposits (probably well underestimated) at Vanguard Cave. Furthermore, future investigation techniques are likely to be more sophisticated, requiring less physical excavation.

Risk Assessment and Scale of Impact

The Nominated Property's Management Plan (Volume 3 of the Nomination Dossier) includes a 'Risk Preparedness Plan' (Volume 3, Appendix 2, page 105ff) with a risk register. The initial evaluation of risk to the Nominated Property's attributes of Outstanding Universal Value (OUV) in 2013 categorized the risk to attributes a, b and d (Gorham's & Vanguard Caves Neanderthal Occupation; Bennett's and Hyaena Caves; Gorham's Cave evidence of the first modern humans in the area; and pollen and charcoal evidence from Gorham's and Vanguard Caves respectively) as 'medium' – excavations likely to happen and of negligible to major severity. Medium is defined as 'low risk to life, posing a degree of risk to attributes of OUV, but damage recoverable and attributes not destroyed'. The risk score and evaluation is derived from the likelihood of the hazard occurring multiplied by the severity (or scale) of the occurrence (Volume 3, page 113).

In the current re-evaluation in this document, the 'hazard' of excavation is certain for the next five years. The scale of direct physical impact on the deposits and finds within them from research excavations (the severity of impact) as described above is minimal, the upper limits represent 0.06% of the Palaeolithic

deposits at Gorham's Cave and 0.75% of those in Vanguard Cave. This is negligible in terms of severity. The risk to the attributes of OUV is therefore re-classified as Low.

It is considered that this low impact is clearly balanced by the gain in knowledge and understanding of the Neanderthals and their way of life, the contribution to the study of human evolution at a critical juncture in that evolution, and the nature of the deposits which will provide detailed information with regards to their long-term conservation.

The estimates will be reviewed annually against information gained, and an assessment will be made of the impact on the site's OUV, using the risk evaluation methodology. In 2020 there will be a full review as a new five-year plan is prepared for approval by the IRCC. The starting point for the 2020-2024 programme will be that no excavation will be permitted other than that approved by the IRCC after detailed justification is presented. This justification will include the basis for further excavation in the light of results obtained during 2016-2020 and an assessment of remaining deposits and their state of conservation.

Table 2 Predicted and Quantified Physical Impact of Archaeological interventions at Gorham’s and Vanguard Caves in the period 2016-2020

Cave Name	Archaeological/Palaeontological Potential	Research Objectives and Interventions 2016-2020
Gorham’s Cave	<p>An 18-metre sequence with an estimated minimum volume of ~80,000 m³ of deposit. Of this, 99% is Palaeolithic</p> <p>This sequence is dominated by Middle Palaeolithic Neanderthal deposits which take up approximately 95% of the whole sequence - ~76,000 m³.</p> <p>The remainder of the deposits represent the Upper Palaeolithic (Solutrean and Magdalenian), Neolithic and Phoenician/Carthaginian.</p>	<p>1. Gaining a better understanding of the use of space by Neanderthals, Opening access to Inner Chamber via passage to south-east of engraving (Objective 7.3.1 c); and assessing the extent and potential of deposits (Objective 7.3.1.d) It is estimated that excavation in this part of Gorham’s Cave will be very slow. Estimating an excavation rate at an annual depth of 0.5 m and a surface area of 2 m², the total estimated volume of excavated sediment for the period 2016-2020 will be 5 m³. This will represent 0.007% of the entire deposit in five years. The slow estimated rate reflects the confined conditions in this area, which will permit a maximum of two excavators at any one time, and its archaeological richness.</p> <p>Excavation will include Upper Palaeolithic Level III as well as the Middle Palaeolithic (Neanderthal) Level IV. The actual volume excavated each year will be assessed against this estimate. At the most extreme case, excavation of no more than 0.01% of the entire deposit will be permitted in the period 2016-2020 without prior approval from the IRCC. At all times a minimum of 50% of the deposit of each representative archaeological horizon will be left untouched. In the case of the Inner Chamber it is expected that the proportion left will exceed this figure substantially.</p> <p>2. Furthering our knowledge of Neanderthal behavioural ecology (Objective 7.3.1 b). It is estimated that the excavation rate in the Middle Area of Gorham’s Cave will proceed at a maximum annual depth of 1 m over a broader surface area than the Inner Chamber, estimated at 6 m². The total estimated volume to be excavated in the period 2016-2020 will therefore be 30 m³. This will represent 0.038% of the entire deposit in five years. All archaeological horizons are representative of the Neanderthals. The actual volume excavated each year will be assessed against this estimate. At the most extreme case, excavation of no more than 0.05% of the entire deposit will be permitted in the period 2016-2020 without prior approval from the IRCC. At all times a minimum of 50% of the deposit of each representative archaeological horizon will be left untouched.</p>
Vanguard Cave	<p>A 17-metre sequence with an estimated minimum volume of ~12,200 m³. The sequence is entirely Neanderthal. The depth of Vanguard Cave may be much greater as the back is sealed by deposits. One challenge during this period will be to better estimate the cave depth using non-intrusive methods, such as geophysics.</p>	<p>3. Improving our understanding of stratigraphy and chronology (Objective 7.3.1 a): continue the excavation down the 17m of deposits to establish a complete chronology for this cave). Estimating an excavation rate at an annual depth of 1 metre and a surface area of 8 m², the total estimated volume of excavated sediment in the period 2016-2020 will be 40 m³. This will represent 0.328% of the entire deposit in five years. The actual volume excavated each year will be assessed against this estimate. At the most extreme case, where volumes of sterile deposits allow for a rapid excavation process, excavation of no more than 0.75% of the entire deposit will be permitted in the period 2016-2020 without prior approval from the IRCC. At all times a minimum of 50% of the deposit of each representative archaeological horizon will be left untouched.</p>

Bennett's Cave	A ~5-metre sequence with an estimated minimum volume of 420 m ³ . The sequence is almost entirely Neanderthal although protohistoric artefacts have been recovered from the surface.	No intervention: 100% of the deposits will remain untouched.
Hyaena Cave	A ~5-metres sequence with an estimated minimum volume of 200 m ³ . The sequence is entirely Middle Palaeolithic Neanderthal.	No intervention: 100% of the deposits will remain untouched.
Goat's Hair Twin Caves	The first cave has an estimated 1-metre sequence with an estimated minimum volume of 43 m ³ . The second cave also has an estimated 1-metre sequence with an estimated minimum volume of 42 m ³ . The sequences, as far as are known, are mainly Neolithic with some Upper Palaeolithic elements. There is no evidence of Middle Palaeolithic Neanderthals.	No intervention: 100% of the deposits will remain untouched.
Martin's Cave 1	This has an estimated 5-metre sequence with an estimated volume of 1,155 m ³ . The sequence, as far as known, is Neolithic and Upper Palaeolithic. There is some newly-discovered evidence of traces of Upper Palaeolithic Art, which is under study. There is no evidence of Middle Palaeolithic Neanderthals.	No intervention: 100% of the deposits will remain untouched. Study of the art will be non-intrusive.

Table 3 Summary of expected impact of proposed Archaeological interventions at Gorham's and Vanguard Caves in the period 2016-2020

Cave Name	Estimated volume of deposit m ³	Estimated volume of Palaeolithic deposit (m ³) at 1 January 2016	Estimated volume of Palaeolithic deposit to be excavated in period 2016-2020 (m ³)	Proportion (%) of Palaeolithic deposit to be excavated in period 2016-2020	Estimated volume of Palaeolithic deposit (m ³) remaining at 1 January 2021
Gorham's Cave	80,000	79,200*	35	0.044	79,165
Vanguard Cave	12,200	12,200	40	0.328	12,160
Bennett's Cave	420	420	0	0	420
Hyaena Cave	200	200	0	0	200
Goat's Hair Twin Caves	85	4.25**	0	0	4.25
Martin's Cave 1	1,155	577.5***	0	0	577.5
Total for Entire Property	94,060	92,601	75	0.081	92,526.75

*Estimated at 99% of the deposit in this cave (95% of the total deposit estimated to be Middle Palaeolithic, associated with the Neanderthals)

**Estimated at 5% of deposit in this cave

*** Estimated at 50% of deposit in this cave

4 Annual Timetables

Annual excavations, normally up to six weeks' duration, at Gorham's and Vanguard Caves will take place during the time window of the summer months (June-August). At least one Chief Co-Director will be present in Gibraltar and in overall charge of the fieldwork throughout the period of excavation. Each site and the laboratory will be directly supervised at all times by a Co-Director. At least one Palaeolithic Archaeologist Co-Director will be present at each excavation site.

Minor interventions may take place, in keeping with the established objectives, at other times of the year. Such interventions may involve, for example, specialists sampling for dating, stable isotopes, phytoliths, aDNA, sedimentology, etc. In such circumstances at least one Chief Co-Director will be present in Gibraltar and in overall charge of the fieldwork throughout the period of excavation. Each site and the laboratory will be directly supervised at all times by a Co-Director and at least one Palaeolithic Archaeologist Co-Director will be present at each excavation site.

Material from the annual excavations will be assessed after fieldwork is finished and an annual report prepared.

A specific work plan and timetable will be produced for each year ahead of the excavations. The previous year's excavation reports will accompany the plan for the year. The annual programme will be approved in advance by the IRCC.

5 Methodology

Excavations

Excavation works are carried out with proper regard to relevant professional, ethical and technical standards. Members of the core project team, the Co-Directors, have appropriate experience, knowledge and qualifications, and membership of archaeological or scientific professional bodies. They also have a wide experience of Palaeolithic sites in Eurasia, including excavations (e.g. at the World Heritage Site of Atapuerca, Spain) and extensive digital surveys (e.g. in the deserts of Saudi Arabia). The Co-Directors also have demonstrable and extensive publication records.

All excavators are briefed at the start of their participation and are given a copy of the current excavation manual for the site, which includes a set of standard instructions on site procedures. These procedures cover health and safety, welfare and expected standards of behaviour (code of conduct), as well as a very detailed explanation of what should be recorded and how. There are also regular (normally daily) update talks for all participants during the excavations. Training is normally on-the-job, but where (for example) there are archaeological students gaining experience, the Co-Directors will encourage students to prepare and keep up-to-date their own Continuing Professional Development (CPD) log and where practicable will provide specific training (for example in surveying or identification of animal bone).

All excavation is by hand. Archaeological levels are carefully excavated stratigraphically and recorded in spits within the stratigraphic layer (in effect single-context recording), based on metre squares subdivided into four parts. The positions of metre squares are set using a Total Station. A standard form-based context recording system is used, and records made using palm-top computers backed up by paper records (in case of wi-fi failure in the caves). Registers of all artefacts and palaeo-environmental material, photographs and survey data are kept. Excavators are responsible for compiling records of their own part of the excavation; all records are then checked on site by the site supervisor at the time. Digital data is backed-up every night onto a USB memory stick and transferred to the Museum laboratory computer.

Each spit is recorded graphically showing the position of all artefacts and ecofacts. All artefacts (lithics) and ecofacts (bone, etc.) are 3D-recorded and, where appropriate, the angle of repose or inclination is also recorded. Larger artefacts and ecofacts are given a unique number and removed by hand, bagged and

labelled. A photographic record of spits, specific distributions or clusters of material or special artefacts is made using digital cameras.

A one-litre sample from all archaeological layers will be kept in the site archive in perpetuity. Subsamples (< 5cc) may be taken from here as and when research questions arise.

There will be a need, during and after excavation, to sample particular levels for purposes of dating, stable isotope analysis, etc. These samples, causing minor impact on the sediments, are taken always from the same sector of each level to minimize disturbance across the entire horizon.

If fragile material is discovered, then arrangements for the immediate conservation of the material will be made with the Team Conservator in the first instance.

Exceptional or unforeseen discoveries are dealt with on a one-off basis, discussed and agreed by the Co-Directors.

All excavated spoil is collected by context and wet-sieved on site using a series of two graded sieves (5mm and 1mm). Material from the 5mm and 1mm sieves is sorted on site, bagged & labelled according to material category and context. The flot (residue of sample) is dried, bagged & labelled for transfer to the laboratory in the Gibraltar Museum for further examination. Large samples (<10 litres) from each context are also taken for laboratory sieving down to 300 μ , where the deposit allows.

All further immediate post-site processing (all materials) takes place in the laboratory at the Gibraltar Museum where the material is rinsed in fresh water, dried, catalogued by material and re-bagged and labelled. It is stored by material category. Any unsorted flot or residues are sorted using a binocular microscope to identify microfauna, etc., before cataloguing and storage by context and material category.

Hand-collected, 3D-recorded and larger sieved material is not normally washed, but is dried, catalogued by material and re-bagged and labelled, and then also stored by material category.

No material from the excavations will be disposed of before examination by the relevant expert members of the team during post-excavation assessment or analysis. No material will be disposed of without the consent of the project Chief Co-Directors.

Once fieldwork is completed, the archive including all finds and records will be held in the Gibraltar Museum. The field records will be checked and if necessary (if not already completed on site) will be entered onto the project's database.

[Public Awareness during the Excavations](#)

Providing information to the public on the current works is done via the local press and media (regular articles and interviews), via the project web site (including possibly live video coverage), and via Twitter. The Team will also arrange for visits if this is practicable, for the local community and for scientific colleagues.

[Post-fieldwork assessment and analysis of project data](#)

The relevant Co-Director, normally the Palaeolithic Archaeologist responsible for site works will draft an interim stratigraphic report, including information on material finds and preliminary recommendations for further analysis, dating, etc. This preliminary report will include a quantified assessment of deposit removed during the investigations to monitor that the planned amounts to be excavated have not been exceeded.

Material recovered will be identified, quantified and assessed (and cleaned as required) by the relevant expert who will make recommendations for further analysis to the chief Co-Directors. The Palaeolithic Archaeologist will then collate a report to the Co-Directors.

The Co-Directors, will review the findings and recommendations and draft an annual summary report for the IRCC, including an updated post-excavation and publication proposal if appropriate.

Annual Report

The annual report will include as a minimum:

- Non-technical summary
- Summary description of the stratigraphic sequence investigated
- Summary narratives, accompanied by quantified data, on all finds' categories and scientific specimens
- A quantified assessment of deposit removed against material collected and potential and information gain
- A summary of new or potential new information gained
- Preliminary recommendations for the next annual programme of archaeological interventions
- Photographs, plans, sections or other illustrations as merited.

The Annual report will be circulated to the Co-Directors, to the IRCC, and (once approved) to the World Heritage Site Bid Steering Group.

A short update will be published on the web site.

Archive

The project archive (all finds and scientific specimens, digital and hard copy records) is deposited in the Gibraltar Museum, which curates the collection on behalf of H. M. Government of Gibraltar.

Long-term curation of the digital archive is currently being considered as part of the integrated database for the candidate site. The main purpose of the site's database is as an information vault, from which information for research, management, trend analysis & eventual publication and annual/five-year reports (including maps) can be extracted. Most of the data will be used by the Museum WH Team, Museum Staff and Researchers, and by other Government Departments. The intention is to include the heritage data as layers in the Government's GIS system. Some datasets or information will be made publicly available via the Museum web site in due course.

The major elements (database groups) are: Conservation Management; Natural Heritage; Archaeology and built heritage; Geology and Landscape; Research and publication; Public understanding and education; Museum Collections; Museum Displays. The GNCE project is reviewing the utility of the 'Arches' heritage inventory and management system, an open source product developed to incorporate internationally-adopted standards for information technology, heritage inventory and heritage data management. It is the system used by Historic England and the British Museum *inter alia*. It needs adaptation (including vocabulary development) for Gibraltar as there are more natural elements.

6 Publication strategy

The strategy for publication of the results of the investigations is normally to publish through a series of academic articles in appropriate scientific journals, such as PLoS and Quaternary Science Review. Major discoveries will be submitted to Nature, Science or Proceedings of the National Academy of Sciences, USA, in the first instance. This is supported by monographs on the excavations (including for example, Barton *et al* 2012) and academic books on specific topics (such as Finlayson 2009). In addition there are books intended for a non-specialist audience (such as Finlayson 2009 *Humans who went Extinct*; and 2014 *The Improbable Primate*). The variety of lead authors demonstrates the partnership approach to publication.

It is proposed to continue this strategy, through a mix of academic articles and books and more popular books, and to add a series of books for a young audience, with one currently in preparation.

7 Health and Safety

The requirements of health and safety, and welfare are paramount and take precedence over any archaeological or palaeontological processes. Project risk assessments are carried out for all activities; all staff and volunteers are briefed on requirements and there are regular project updates throughout the field work. The Co-Director responsible for Health and Safety is Dr Geraldine Finlayson.

8 Environmental protection

Archaeological activities have the potential to affect the environment and professional archaeologists have ethical responsibilities to care for the environment. Conscientious protection of people and the environment is an integral part of the Gibraltar Museum's working practice. It is our intention that all work be carried out in accordance with the relevant statutory provisions and should seek to exceed them where possible. All reasonably practicable measures will be taken to avoid and/or ameliorate potential damage or nuisance to people and impact on the environment. Avoidance of nuisance or damage is the first objective. Where this is not practicable, the second objective is to ameliorate the impact by appropriate methods. In particular, we seek to minimise our impact on the environment by reducing waste, pollution and emissions, by promoting recycling and by taking into account environmental and ethical considerations when sourcing products, supplies and equipment wherever possible. This organisation's management and supervisory staff are responsible for implementing this environmental policy and must ensure that, subject to requirements of Health and Safety, environmental protection has a high priority in planning and day-to-day supervision of work. All employees, sub-contractors and visitors are expected to co-operate with the Gibraltar Museum in carrying out this Policy, and ensuring their own work, in so far as is reasonably practicable, is undertaken without risk or nuisance to themselves or others, or to the wider environment.

Mr Stewart Finlayson has particular responsibility for environmental matters, and reference should be made to him in the event of any difficulty arising in the implementation of this Policy. Appropriate external advice will be sought where necessary. The operation of this Policy will be kept under review and monitored by the management and staff of the Museum at all permanent and temporary workplaces.

9 Monitoring

There is in place a hierarchy of monitoring the effectiveness of policy objectives and work plans for the Nominated Property. Since December 2014 there has been a series of indicators and measures (Volume 3, Section 22, page 96ff) in place to monitor the effectiveness of the Management Plan's implementation against the agreed eight Policy Objectives (Volume 3, Section 10, page 59). These indicators are monitored overall by the World Heritage Bid Steering Group which meets quarterly and receives updates and reports on progress. Table 4 below shows the objectives and indicators relevant to the investigations.

Policy Objective 2, to foster the gathering and dissemination of scientific information about the Site, is also kept under review by the International Research and Conservation Committee (IRCC). As described in Volume 4 of the Nomination, the IRCC's role as an independent, international committee of experts, is to assess the archaeological research at Gorham's and Vanguard Caves and in particular to ensure a balance between excavation and conservation of deposits commensurate with the property's current status and its potential inscription as a UNESCO World Heritage Site. The Chair of the IRCC is also a member of the Steering Group, and receives the updates on wider matters.

The IRCC is consulted on the draft strategies and objectives and has to agree them before implementation. It approved the draft Research and Conservation Strategy including the five-year objectives for the continuing scientific investigation in March 2015:

- a) Improving our understanding of the stratigraphy and chronology of the sequences at Gorham's and Vanguard Caves

- b) Furthering our knowledge of Neanderthal behavioural ecology over large timescales, using information from terrestrial and sub-marine deposits
- c) Gaining a better understanding of the use of space by Neanderthals within the caves
- d) Assessing the extent and potential of the caves' deposits
- e) Modelling quantitative ecological reconstructions by using present-day biological proxies
- f) Ensuring an effective and integrated archive, available for future researchers and for the management of the nominated project

The Heritage Licence which is required for the research works under the Gibraltar Heritage Trust Act 1989, is issued by HM Government of Gibraltar's Ministry of Sports, Culture, Heritage and Youth, and signed by the Minister for Heritage. This licence authorises the Gibraltar Museum to carry out the works subject to formal conditions, including that the research undertaken is within the limits agreed by the World Heritage International Research and Conservation Committee and set out in the 2015-2020 Research and Conservation Strategy for the Gibraltar Neanderthal Caves and Environments candidate World Heritage Site. If the IRCC is not satisfied with the work carried out by the Museum, the Chair is able to advise the Minister for Heritage, who will take appropriate action in consultation with all relevant stakeholders.

Table 4 Relevant Overarching Management Plan Indicators (Agreed by Steering Group December 2014; Nomination Dossier Volume 3, section 22, page 96ff)

Policy Objective	Indicator	Measurement	Periodicity	Comments
1 Safeguard the site's Outstanding Universal Value	5 List and number of features at risk within the WHS	Development of an indicator[s] for volume of deposits excavated during the five-year period	Annually; full review every five years	This Action Plan sets down an indicator. To be reviewed annually
2 Foster the gathering and dissemination of scientific information about the Site	12 Research strategy	Research Strategy	Annually or as needed	Completed March 2015; due for review 2020 (moved from 2019)
	13 Fieldwork and surveys	Fieldwork Guided by research strategy, each with specific research questions	Annually	March 2015; six objectives for the period 2016-20
	14 Partnership working	Monitor team composition	Annually	In place, but under ongoing review
	15 Publication Records	List of all academic publications by year	Every five years	List in preparation for 2015 annual report to Steering Group due 10 th March 2016 (see also attached bibliography)
5 Provision of high quality range of educational information and services about the Site	28 Conferences and lectures	Calpe Conference	Major conference every three years	Calpe 2015, 24-27 September, on 'Redefining the Neanderthals'

Routine activities and progress are monitored through the monthly departmental meetings (Executive Management Group). Day to day activities and routine management are controlled and monitored by the Gibraltar Museum Team led by Professor Clive Finlayson. In the case of the excavations at Gorham's and Vanguard Caves, Table 5 shows the monitoring arrangements.

Table 5 Responsibility for monitoring elements of research excavations and analysis

Item	Prepared by	Checked by	Agreed by	Monitored by	Frequency
Research Strategy	WH Team;	Director WHS	IRCC	IRCC and Steering Group	Review every five-years
Detailed 5-year Action Plan	WH Team: Director, WHS Co-ordinator; Head Cultural Heritage (CH)	Director WHS	Co-Directors and IRCC	Chief Co-Directors; IRCC	Review every five-years
Annual Action Plan	WH Team: Palaeolithic Archaeologists	WHS Coordinator and Director WHS	Co-Directors and IRCC	Chief Co-Directors; IRCC	Annual; three months before any further field work
Post-excavation Assessment/Interim Report and Updated project design	WH Team; Palaeolithic Archaeologists	WHS Co-ordinator; Head CH	Co-Directors and IRCC	WHS Co-ordinator; Head CH	Weekly or monthly as needed
Archive and collections	Palaeolithic Archaeologists	WHS Co-ordinator; Head CH	Co-Directors	WHS Co-ordinator; Head CH	End excavations, plus once a year
Archaeological Practice Standards	WH Team; Palaeolithic Archaeologists	WHS Co-ordinator; Head CH	Co-Directors	Head CH; Co-Directors	Weekly during excavations; monthly during office and lab work
Health and Safety	Risk assessment Palaeolithic Archaeologist	WHS Co-ordinator	Co-Directors	WHS Co-ordinator; Co-Directors	Weekly during excavations; monthly during office and lab work. External advice as needed.
Environmental Protection	Annual Plan: Palaeolithic Archaeologist	WHS Co-ordinator	Co-Directors	WHS Co-ordinator; Director Natural Heritage	Weekly during fieldwork
Condition monitoring during excavation (Photo Survey)	Palaeolithic Archaeologists	Head CH	Co-Directors	WHS Co-ordinator; Head CH	Daily during fieldwork

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Gibraltar Neanderthal Caves and Environments

CONSERVATION MANAGEMENT REPORT

ARCHAEOLOGICAL & CONDITION SURVEY OF BUILDINGS WITHIN THE NOMINATED PROPERTY

Document Number	CM15.1	Status	Draft
Version Number	1	Date	15.02.16
GNCE Policy Objective	1	GNCE Indicators	5
Author	Sue Davies and Phil Smith	Head of Cultural Heritage, Gibraltar Museum Senior Guide and Site Manager, Gibraltar Museum	
Checked by	Clive Finlayson	Director, Gibraltar Museum	

ARCHAEOLOGICAL & CONDITION SURVEY OF BUILDINGS WITHIN THE NOMINATED PROPERTY 2015

INTRODUCTION AND BACKGROUND

The Gibraltar Neanderthal Caves and Environments Property has been submitted to UNESCO for inscription on the World Heritage List (January 2015; decision July 2016). The property covers an area of 28 hectares (ha), with a land buffer zone of 341 ha and a sea buffer zone of 70 ha. The site rises from sea level, where two caves, Gorham's and Vanguard form the principal components of the site, to the highest point of the Rock at 426m AOD by O'Hara's Battery. Topography and abrupt relief make it remarkably remote and well-protected. It retains its authenticity and integrity, a testament to its natural resilience.

The property is essentially a Neanderthal occupation site that retains features and functions which have persisted to the present day. The coastal plain which, along with the cliffs, was the hunting ground of the Neanderthals is currently submerged but would have been dry land for long periods except in high-level sea stands during inter-glacial periods, and during the past 10,000 years. The landscape today, with the current sea level position and the submerged shelf, would have been similar to the inter-glacial Neanderthal landscape of 125,000 years ago. The property provides a unique opportunity for people to experience the environments that were present when the Neanderthals lived and to appreciate the landscape and way-of-life of the Neanderthals. A 26-year international, multi-disciplinary research project has revealed the vital importance of the site in our understanding of a critical juncture in human evolution and of the Neanderthals in particular. Of special importance is the evidence for their behaviour and of their landscapes. The physical features which give the property its potential Outstanding Universal Value (OUV) include the caves and their deposits which contain much of the evidence for the Neanderthals, the cliffs, raised beaches and scree slopes and the vegetation.

There is evidence for use of the site by early Modern Humans, as well as a modest amount of evidence for Neolithic usage. The sea caves also provide evidence of use by Phoenicians and Carthaginians from the 8th to the 2nd Centuries BCE but there are no known features of substance in the property before the development of British fortifications after 1704. This part of the east side of Gibraltar is relatively remote with its steep slopes and vertical cliffs, and is unsuitable for residential settlement.

However there are several minor fortifications within the nominated property. They mirror major fortifications located outside the property that represent the evolution of the fortress, but the ones within the site only cover the period from the 18th Century to the years following World War II. The majority are World War II structures built within a relatively short time span for the purposes of supporting the defence of the Rock. These were commonly modified or adapted during the Cold War years and became obsolete thereafter. No fortifications from the 12th – 17th Centuries are located within the property. Sites include observation posts, gun batteries and related structures such as range finders and fire control positions (Rollo, 1990). Some sites remain in the ownership of the Ministry of Defence (MOD), others have been adapted for civilian purposes. Sites identified in the Nomination Dossier (Volume 1, section 2.1.15) and reported here are:

- (a) Europa Advance Batteries – 18th Century to World War II. The complex consists of four batteries, three of which (1st to 3rd Batteries) are in the process of conversion into viewing platforms for the property. The fourth was sited near Monkey's Cave;
- (b) Mediterranean (or Martin's) Battery – 19th Century to World War II;
- (c) Advance Light anti-aircraft (LAA) Site – World War II; and
- (d) AROW Street sites:
 - AROW Street DEL Sites – World War II;
 - Sandy Cave DEL Site – World War II;

- AROW Street Gun Position – World War II; and
- Scree AASL Site – World War II

In addition Monkey's Cave Convalescent Hospital (World War II) is adjacent to the entrance to AROW Street, and is located above the sea caves by the access steps down to sea level.

Though these fortifications do not contribute to the nominated property's OUV, as identified in the Nomination Dossier, they do have intrinsic historical, evidential and social value and are a part of the heritage of Gibraltar. The 1st and 2nd Europa Advance Batteries and Mediterranean Battery are Category A-Listed, designated and protected under the Gibraltar Heritage Trust Act 1989. All these cultural heritage assets (listed or not) have to be managed, both to understand and protect their own values and, where practicable, to provide suitable information and interpretation for visitors.

This report brings together the results of the surveys of individual structures carried out between August 2015 and January 2016. It also draws on the property-wide baseline condition surveys (photographic surveys) carried out during 2015. The report is not intended to be a comprehensive detailed gazetteer and history. It is a summary of general condition and will be used to develop priorities for further conservation management actions.

AIMS

Following basic conservation management principles, the aims of the archaeological and condition surveys were:

- to make a baseline record of the structures;
- to gain an understanding of the fortifications, their history, scale and present condition;
- to identify issues affecting the structures, individually and collectively;
- to assess whether individually or collectively they might adversely affect the property or its attributes of OUV;
- to assess potential for interpretation and explanation; and
- to recommend appropriate management actions.

METHODOLOGY

The historical background was researched using easily-accessible secondary sources, principally Rollo 1990, *Guns on the Rock: The British Artillery Defences of Gibraltar 1704 to 1989* (unpublished report); Hughes and Migos 1995, *Strong as the Rock of Gibraltar*; Fa and Finlayson 2000 *Fortifications of Gibraltar*; mapping held by the Gibraltar Museum; and UK National Archive material.

All sites were inspected, typically by two people: measured sketch diagrams were made, supported by a photographic record. Condition was recorded and assessed using a standard form devised for the purpose of general condition monitoring of built structures (Appendix 1). Individual elements were evaluated using a descriptive rating system, and then combined to give an overall assessment of condition as follows:

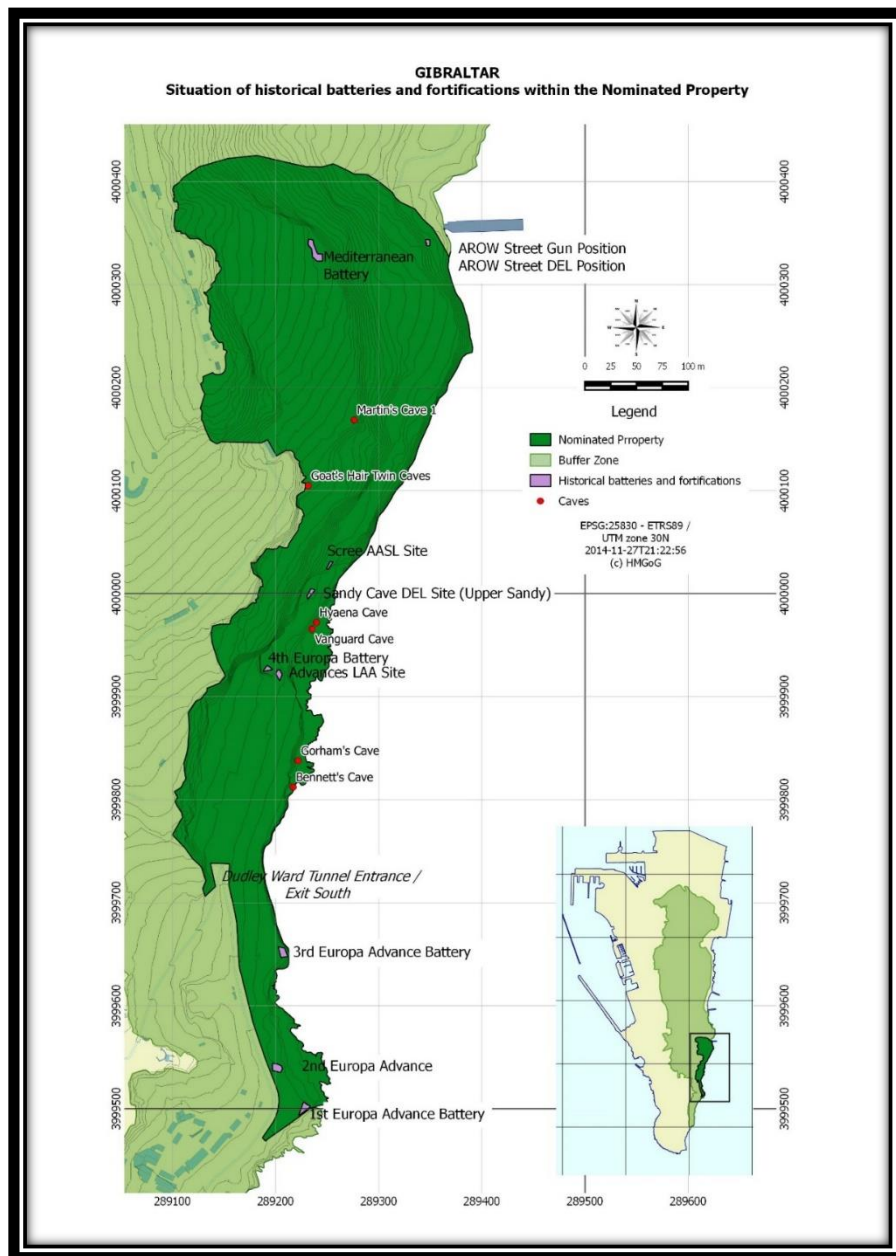
Score/Rating	Description
1 Poor	High to very high risk of loss or major damage, some irreparable damage to structure values (e.g. most or all key elements missing) or site very unsafe for access; in need of urgent conservation or other work.
2 Fair	Medium degree of risk to structure. Some damage but recoverable, <40% of structure attributes present. Risk of decay or loss, or damage to structure in medium term (<5 years), in need of conservation, or other work in medium term.
3 Good	Low risk of decay or loss, possibly negligible to structure values in longer term (>5 years) but reparable. Most key attributes of site present and understandable. Site safe and accessible, but elements (e.g. interpretation, minor repairs) could be improved.
4 Very good	No risk of decay or loss to structure values. Site safe and accessible.

Individual elements recorded include condition of the actual structural parts, floors, roofs, walls, interior and exterior, effects of vegetation, animals, birds or insects, natural effects such as rock falls, effects of visitors, health and safety, and any conservation measures.

The archive records are similar to a 'Level 2' Historic England building record, but focus more on condition. A Level 2 record is a descriptive record used to gather basic information for management and planning purposes, or to identify buildings requiring more detailed attention at a later date. The drawn record is not comprehensive, but is supplemented by the photographic record. The record presents conclusions about the structure's development and use, but does not detail the evidence on which those conclusions are based.

LOCATION

With the exception of Mediterranean Battery on Mediterranean Steps, all sites lie along Europa Advance Road or Lower Burma Road into the AROW Street Tunnel.



Note: the location plan above is taken from the Nomination Dossier Volume 1, Figure 1.1. Since the Dossier was produced the buffer zone has been extended to include the sea waters immediately east of the property, to the boundary of the Town Planning Zones. This extends the buffer zone out eastwards by some 300 metres.

CONDITION AND ISSUES

Europa Advance Batteries (Batteries 1-3: Scores 3/4; Battery 4: Score 2)

The four batteries are in good condition, the walls are the key attributes of the site present and understandable, and in good condition, but there are no internal structures visible. Some earlier remnants from the 18th and 19th Centuries may survive under the later, historical, remodelling as part of military restructuring. The 1st and 2nd Batteries are in very good condition and will be used as viewing platforms for the property.

The 3rd Battery has been renovated to reduce the visual impact of the minor modern structures from land and sea. The overall condition is good, but removal of these structures is desirable in the medium term, and is scheduled when the battery becomes a second viewing platform.

The 4th Battery walls survive in good condition, but all interior features were historically removed by the military as part of their process of restructure. The site is in MOD ownership and use but is not threatened.

Mediterranean Battery (Score 3)

Mediterranean Battery is in good condition. The two range finder positions are in good condition, with fairly sound and renovated structure and some internal features remaining. The site and its development are still understandable, and it is well positioned as a potential interpretation point on the walk along the Mediterranean Steps. A viewing platform has already been put in place with seating. The site provides an opportunity to have information about the nominated property and its OUV as well as about the military history of the area. The range finders would provide a sheltered area for interpretation boards.

World War II Sites – AROW Street and associated sites (Score 3)

The Advance Light Anti-Aircraft Site is in good condition, but remains only as a platform with no visible remains of the gun position. The site is the entrance to the military facility and not publically accessible.

Monkey's Cave Hospital façade has been renovated to merge it with the cliff background. The façade is now in good condition. The lower floors of the building are used for storage of museum items. The structure requires medium-term monitoring.

The AROW Street Tunnel complex is in good condition. The complex is understandable and the surviving documentation is good. Within the 700 metres of the tunnel are four roving gun positions and four Defence Electric Light Sites.

RECOMMENDATIONS

Europa Advance Batteries

1st and 2nd Batteries:

- Removal of recycling centre – this has been agreed and is in the process of being removed;
- Installation of viewing platform for sea caves with small office and parking. Planning permission has now been granted; timescale for building March to July 2016.
- Archaeological recording before and during works (see gazetteer entry).

3rd Battery:

- Conversion to viewing platform when site available (expected 2017).
- Removal of current modern structure at front of platform, possible conversion western building. Detail plans during 2016.

4th Battery:

No recommendations.

Mediterranean Battery

- Installation of information and interpretation panels (currently in hand).
- Refurbishment of Range Finders for interpretation centre, covering the property and its values and the wider military history, as well as detailed history of the Battery itself (medium term).
- If funding allows, further renovation of remaining buildings (long term).

World War II Sites – AROW Street and associated sites

Monkey's Cave Hospital:

- Use as store for archaeological investigations and biological monitoring (in hand).
- Monitor stability regularly (Technical Services Department).
- Regular maintenance programme (in hand).

AROW Street Tunnel Sites:

- Consider installation of information board with summary information at southern tunnel entrance (by access to sea caves – in hand).
- Work with MOD on maintenance programme to buildings in AROW Street/Upper Sandy.
- Annual inspection if practicable.

General

- Continue process of research and surveys within the property.
- Feed information into interpretation and information boards around site.

GAZETTEER

EUROPA ADVANCE BATTERIES



The 1st to 4th Europa Advance Batteries are located along the coastal cliff-top of south-east Gibraltar, east of Europa Advance Road, within the nominated World Heritage Property. There is no evidence of their use during the Moorish or Spanish periods, as defences at these times concentrated on the more vulnerable northern and western sides, but the British considered this an important area to protect against vessels approaching from the Mediterranean and they sited cannon here from before 1720.

The gun platforms were initially constructed of roughly shaped limestone blocks and mortar, with a low parapet around the outer edge. First and 2nd Batteries were located close together on the same outcrop, with the 1st Battery covering south and east, and 2nd Battery north. The 3rd Battery was built as a separate platform approximately 150 metres further north.

Early smooth-bore cannon on the sites were as small as 3- or 4-pounders, but towards the end of the 1700s, 18-pounders became the norm and by the mid-1800s 32-pounders were the standard armament. Also around this time a fourth battery constructed 250 metres to the north of the 3rd Battery.

A 1906 proposal for mounting two 4 inch quick-firing guns on one of the batteries was not acted on, so the batteries remained out of use until the Second World War, when a Nazi invasion of the Rock was feared following the fall of France in June 1940. 1st, 2nd and 4th batteries were armed again, but all equipment was removed at the end of the war. Fire control and other gun positions are extant west of Europa Advance Road (outside the Nominated Property).

←1st to 3rd Europa Advance Batteries from the Mediterranean Steps path, looking south (3rd Battery at bottom of photograph)

After the war, the batteries were taken over by local government and used for various purposes, with the 3rd Battery being used by the clay target shooting club and the area of 1st and 2nd Batteries having several minor uses.

1ST AND 2ND EUROPA ADVANCE BATTERIES

<i>Legal status</i>	Category A Listed (Gibraltar Heritage Trust Act 1989 as amended, Schedule 1)		
<i>Approximate date</i>	Early 18 th Century (built before 1720) to 1960s	<i>Condition</i>	Very Good
<i>Stability</i>	Stable	<i>Sensitivity/Value</i>	High
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	No
<i>Current usage</i>	Recycling facility which has now been closed down as part of the improvements to the site		
<i>Proposed usage</i>	Viewing platform for Nominated Property including sea caves, with interpretation panels, small office facility and on-site guide. Planning permission granted 28.01.16. Method Statement for Archaeological Recording mitigation submitted with application (below).		

The 1st and 2nd Europa Advance Batteries lie at the southern end of the Nominated Property on the cliff edge adjacent to Europa Advance Road. The site is roughly triangular with the two batteries joined up, with a single entrance to the south. Originally there were two roads down to the individual batteries reflecting the steep slopes and difficult access. The south wall of the 1st Battery (southernmost) is some 60 metres long to the gun position and some 30 metres deep (Europa Advance Road to the sea wall central gun position). The 2nd Battery seaward parapet wall is a similar length, but a section of the original early 18th-Century 2nd Battery survives immediately to the north.

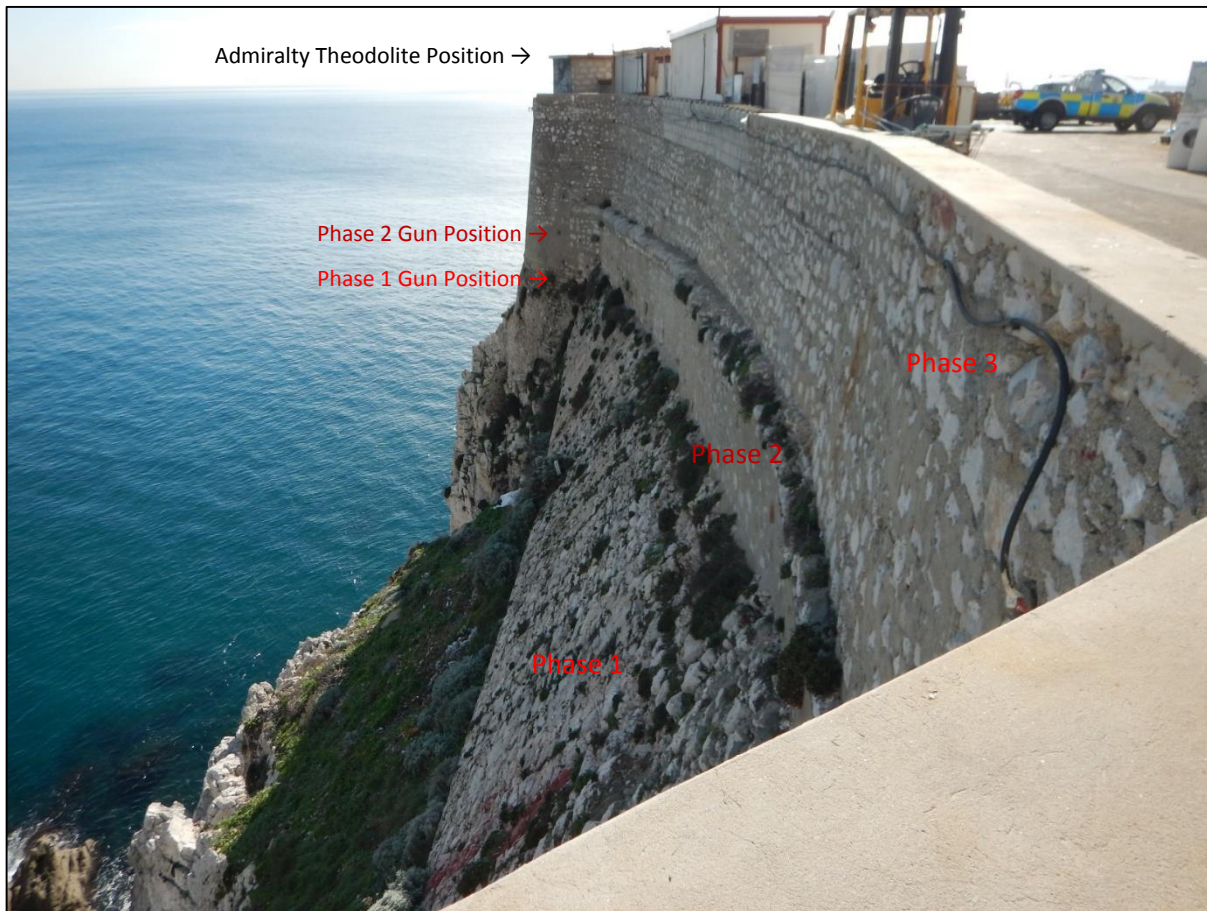
There appear to be three main phases of build and refurbishment, one main phase of demolition and one phase of 20th Century temporary build:

Phase 1 c 1705-1720: 1st and 2nd Europa Advance Batteries were constructed on a north-south sloping cliff-edge site before 1720;

Phase 2 Mid-19th Century: parapet walls and floor levels raised, ground strengthened and site slope reduced probably to accommodate and manoeuvre heavier (32 and 64lb) guns. The shape of the original battery was followed;

Phase 3 World War II: site raised by approximately 2.8 metres at north end by 2nd Battery upper gun position, and by some 5 metres at south end; site levelled to accommodate 4" Naval guns; and

Phase 4 post-World War II: demolition of all buildings, but installation of an Admiralty Theodolite structure on 1st Battery between 1950 and 1967.



1st (top of photograph) to 2nd Europa Advance Batteries northern parapet and retaining walls showing construction phases.

Phase 1 c 1705-20

The original 1st and 2nd Europa Advance Batteries were constructed between 1705 and 1720 on a north-south sloping cliff-edge site. The original squared rubble walling is clearly visible at the base of the current wall along the south-east side of the 1st Battery; there is a substantial inclining retaining wall on the north-east side between 1st and 2nd Batteries at the base of the wall, and a stone buttress on the gun position. The original opening for the firing position is still visible on the north side of the mid-19th Century gun position approximately 6 metres below the present ground surface of the battery. The foundations of this retaining wall are some 8 to 12 metres (south end) below the current ground level; the top about 4-6 metres below current ground level.

The base of the retaining seaward wall to Europa Advance Road has early 18th-Century build at its base from approximately the north edge of the proposed visitor facility building northwards.

The northernmost part of the original 2nd Battery built in the early 1700s still survives at a lower level (at approximately 32.8 metres AOD). The area is covered in scree and part of the original parapet wall has fallen or been pulled down, but the firing position is still clear. A cliff-edge wall leads from this battery north towards Coptic Cave.

The condition of the Phase 1 structures that can be seen from above looks to be good. There are stone/earth rubble deposits covering some areas of the walls and inside the north part of 2nd Battery, and parts of the parapet walls in the northernmost part require attention. Surviving parts of the early 18th Century retaining wall to Europa Advance Road (2nd Battery) are in good condition.

Phase 2 Mid-19th Century

The Phase 2 strengthening followed the same plan as that of Phase 1, except in the northernmost part of 2nd Battery. The ground level of the batteries was raised over the proposed viewing platform area and the slope reduced probably in the 1850s to take heavier guns, though there was still a 4-metre drop from north to south. 18-pounder guns became the norm towards the end of the 18th Century and by the mid-1800s 32-pounders were the standard armament. The changes at 1st and 2nd batteries reflect these developments. Around this time, a store and guard room were constructed between 1st and 2nd Batteries. The largest cannon mounted here were two 64-pounder rifled-muzzle loaders, which were on 1st Battery in 1885. A new parapet wall was constructed which can be clearly seen above the earlier retaining wall. The top of that Phase 2 wall is about 2.8 metres below present ground surface adjacent to the central gun position.

The 1865 Rock Model (in the Gibraltar Museum) shows the defensive parapet wall with [rifle] firing loops between 1st and 2nd Batteries, gun positions, a storehouse behind 1st Battery firing position, and a smaller building at the south end of 1st Battery. The model also clearly shows the slope down to the south from 2nd to 1st Battery.

The Phase 2 walling has been re-pointed, but its condition looks to be good.

Phase 3 World War II and Phase 4 post-World War II

The site was raised and levelled again during World War II and Europa Advance Road seems to have been widened at the same time. Remnant cliffs/rocky outcrops behind the rectangular stores building were levelled and a single access from the southern edge of the site was constructed. A 6-pounder Hotchkiss gun was deployed to 2nd Battery in June 1940, but in August was replaced by two 4-inch guns, supported by a range finder and later two searchlights, one to the north and one south. In September 1942 the battery was further strengthened with the addition of two Z Projector anti-aircraft rocket launchers, which would protect the Rock in the run up to Operation Torch, the allied invasion of North Africa, which began in November. These and one 4-inch gun were removed in 1944, with all remaining equipment being taken away at the end of the war. The whole complex extended to the west of Europa Advance Road, and remnants are still extant to the west.

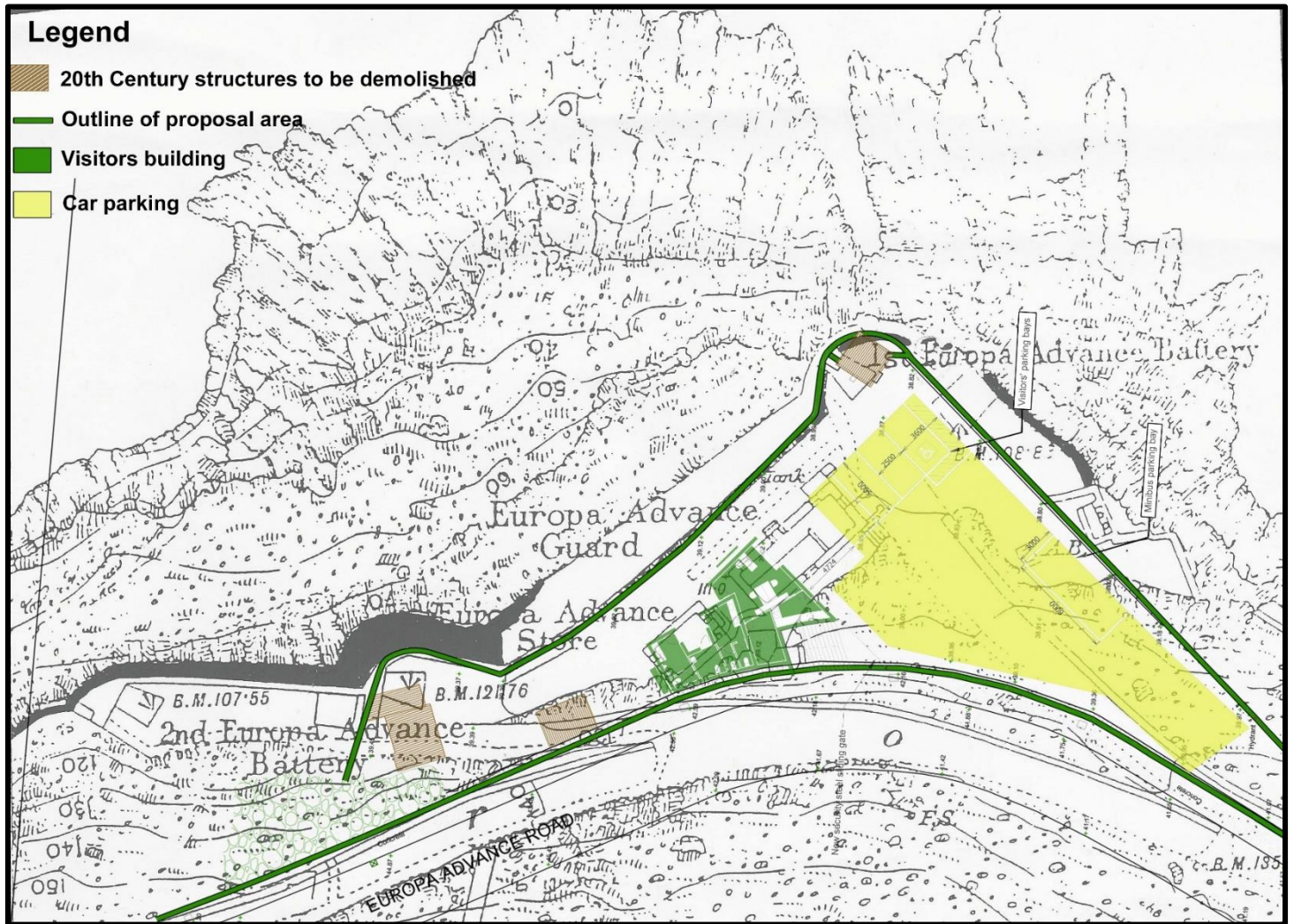
All buildings on the 1st and 2nd Batteries were demolished after World War II, though an Admiralty Theodolite position is shown on a 1967 map and photograph. That building is still extant.

It is unclear what, if any, remains of the internal layout of the 1720s and mid-19th Century re-build survive beneath the later infill phases.

Overall condition

The external walling of Phases 1-3 appears to be in good condition, but more detailed examination and recording is needed to establish the extent of survival of 18th Century work. This is planned to coincide with the minor works related to the development of the site for viewing platforms.

Proposed Viewing Platform for the Nominated Property's Sea Caves – Archaeological Mitigation



1890s map of Europa Advance Batteries, showing outline proposals for visitor centre.

The proposed viewing platform will involve the demolition or removal of existing modern structures used by the old recycling facility, the construction of a small office and toilet facilities and the installation of information boards around the site. Foundations will be cut down to a depth of c 0.5 metre, but it is unlikely that any surviving internal detail from Phase 3 (World War II) survives so that these works will not have any impact on extant historical structures. Earlier levels are protected under substantial build-up during World War II raising of all site levels. As a general principle, preservation of archaeological and historic remains will be *in situ* where possible and practical. Where this is not feasible or the remains are very fragmentary, preservation will be by record. The following measures are proposed:

1. Watching brief during any geotechnical works. The results will feed into the final design and construction. As a minimum response a further archaeological watching brief would be kept during the excavation for the raft and footings to record any subsurface remains.
2. Desk study of accessible documents, cartographic sources, photographs and books.
3. Level 2-3 record of site after clearance **
4. Level 2-3 inspection to include wildlife survey, e.g. for bats.
5. Watching brief during excavation foundations and removal car park surface.
6. Define appropriate conservation measures for retaining wall to Europa Advance Road after survey.
7. Define appropriate conservation measures for repair to seaward parapet walls after survey.
8. Monitor implementation of conservation measures.
9. Clear loose rubble from north part of the 2nd Battery, repair parapet wall.
10. Continue weekly photographic condition monitoring with full review annually.

11. Produce report on above, suitable for publication in an appropriate medium.
12. Produce archaeological archive for above to comply with professional standards.
13. Results to be integrated, where relevant, into information panels on site to interpret the historical military remains.

All works to comply with professional Standards and Guidance, Chartered Institute for Archaeologists and Archaeological Archives Forum. Works to be overseen by a full Member of the Chartered Institute for Archaeologists.

** A Level 2 Record is descriptive. It includes inspection, formal description and photographic record, supplemented by some plans but not a comprehensive measured and drawn record, for example there would be no detailed elevation drawings. The record will present conclusions regarding the structure's development and use, but not the detailed evidence. A Level 3 record is analytical; a systematic account of the structure's origins, development and use, including an account of the evidence on which conclusions are based (eg documentary sources.), allowing the validity of the record to be re-examined in details. It will include all drawn and photographic records which might be required to illustrate the structure and its development and support an historical analysis.

3RD EUROPA ADVANCE BATTERY

<i>Site Name</i>	3rd Europa Advance Battery		<i>Location</i>	Europa Advance Road
<i>Legal status</i>	Category A Listed (Gibraltar Heritage Trust Act 1989 as amended, Schedule 1)			
<i>Approximate date</i>	1720s to 1960s	<i>Condition</i>	Good	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	No	
<i>Current usage</i>	Clay target shooting position (used intermittently)			
<i>Proposed usage</i>	Viewing platform for Property including sea caves, with interpretation panels, small office facility and on-site guide; to be installed 2017.			

The 3rd Europa Advance Battery was constructed around 1720. It was a parapeted platform approximately 25 by 40 metres, made of rough-shaped stone, held together with mortar. The outer edge of the original 18th Century battery wall is still visible from the south and from seaward (Photograph 1). It appears in good condition.

There were originally embrasures for four guns, but in 1771 only one small 4-pounder gun was mounted there. By 1781 two 12-pounders were added and in 1834 there were two 18-pounders, the standard armament for all the batteries in the area. By 1859 the standard armament was increased to 32 pounders and these remained here until 1889, when the then obsolete guns were removed from all the batteries.

Unlike 1st and 2nd Batteries, which were re-armed in WWII, there is no further record of guns being positioned here, although the site has undergone considerable later modification. The level of the 18th-century platform has been raised by some 6 metres, creating a much larger flat platform. This appears to be contemporary with similar works carried out at 1st Battery around 1940, and would have involved substantial work but its wartime function is currently unknown.

In the post-war era, the site was handed over to local government and for over 20 years has been home to the Gibraltar Clay Target Shooting Association. They added a structure along the front of the battery from where the targets are launched, and at the rear, a raised firing platform with a small clubhouse on it. These modern buildings have recently been clad in stone and wood, to help them blend in with their surroundings (Photographs 2 to 5). The Association are due to be re-located elsewhere in 2017, after which an additional viewing platform for the Nominated Property is planned.

The higher modern wall is also in good condition and contrasts distinctly in colour and construction method with the older wall below. The platform appears to be coated in modern concrete and the parapet wall has undergone some later modification.

The two modern buildings, although very basic and functional in style, are structurally sound.



←Photograph 1 from the south clearly shows the early 18th Century rubble and mortar build of the first phase battery at the base of the 6-metre high 1940's raising of the platform.



↑Photograph 2: View of 3rd Europa Advance Battery, from 1st & 2nd Europa Advance Batteries before remedial works, showing the sea caves of the candidate World Heritage Site.



↑Photograph 3: View of 3rd Europa Advance Battery, from 1st & 2nd Europa Advance Batteries after remedial works to reduce visual impact from land and sea.



↑Photograph 6: 3rd Europa Advance Battery from the north before refurbishment, in 2014, with 1st and 2nd Batteries to the top.



↑Photograph 7: 3rd Europa Advance Battery from the north after refurbishment in early 2015, with 1st and 2nd Batteries to the top.

4TH EUROPA ADVANCE BATTERY

Site Name	4th Europa Advance Battery		Location	Burma Road
<i>Legal status</i>	Not listed			
<i>Approximate date</i>	Earlier 19 th Century (first mentioned 1834)	<i>Condition</i>	Fair to good.	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	Yes	
<i>Issues</i>	Measured survey and detail photographs not feasible due to continuing military use			
<i>Current usage</i>	Military			
<i>Proposed usage</i>	Military			

Situated on a rock promontory immediately south of Monkey's Cave, this is the only structure within the area that pre-dates World War II. First recorded in 1834, it was a wide gun platform, or terreplein, added to augment 1st to 3rd Europa Advance Batteries which had previously been constructed to the south. Their role was to protect against vessels attacking the Rock from its Mediterranean side. The battery originally supported three 18-pounder smooth-bore cannon, one pointing north and two pointing east. These were later upgraded to 32-pounders. All of these guns were removed in 1889, after which there is no further recorded use of the battery.

The platform, built of chiselled limestone blocks mortared together, is still present. A modern office structure sits on the southern part of the platform. The parapet wall appears to have been later re-built probably during the Second World War, and possibly re-shaped, using the original limestone blocks, but held together with modern cement.



4th Europa Advance Battery from the north. The battery wall is visible on top of the Second World War tunnel cut through to Monkey's Cave Hospital and AROW Street. The access steps to the sea caves descend from just below the battery behind the railings.

MEDITERRANEAN [OR MARTIN'S] BATTERY

Site Name	Mediterranean Battery		Location	Mediterranean Steps Path
<i>Legal status</i>	Category A Listed (Gibraltar Heritage Trust Act 1989 as amended, Schedule 1)			
<i>Approximate date</i>	1834 to 1958	<i>Condition</i>	Good	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low to medium	<i>Restricted Area</i>	No	
<i>Current usage</i>	Viewing point.			
<i>Recommended use</i>	Interpretation point along Mediterranean Steps walk, inside and outside buildings, information on the Nominated Property and the military history.			

Mediterranean Battery is located on the cliff face on the south-east slope of the Upper Rock close to the northern boundary of and within the nominated property. It lies on the Mediterranean Steps Path. It consists of a group of assorted military structures and their remains which were built between 1834 and 1942. It was still operational as late as 1958. Its military use includes being at various times a coastal defence battery, fire control position, range finder position and anti-aircraft battery.

The site is spread along and above a naturally-occurring terrace which has been artificially widened and the path for the Mediterranean Steps walk passes directly through it. The site is some 100 metres north-south and 50 metres wide. At the north end there is a wider, flat area with two natural caves in the cliff on its west side. As the ground falls away steeply to the north and east, this gives excellent views of the east side of the Rock especially of the cliffs below the ridgeline and the Catalan Bay Sand Dune which formed between 130,000 and 95,000 years ago during the Neanderthals' occupation, and also of the Costa del Sol and Mediterranean Sea. A viewing point lies at the north extremity of the site, and there is a small gravelled viewing point at the extreme south of the site (former searchlight position).



Aerial view looking west (south to the left of the photograph) of the Mediterranean Battery Complex. The site sits on the cliff edge above the former Ammunition Jetty (which is immediately outside the boundary of the nominated property). It commands excellent views to south, east and north. The photograph also shows the Mediterranean Steps Path constructed to facilitate military operations in the mid-19th Century. Lower centre is the WWII Southern Range Finder, with the Northern Range Finder on the right close to the north end. These are both in good condition. Between and around them remains of searchlight positions and gun positions remain as foundations only. The structures just off the path leading up from the Northern Range Finder (to the south) are in poor condition and are blocked off. Photograph from Apple Satellite view.

The Gun Battery (c 1834)

With the technological advances brought about by the industrial revolution, the 1800s saw Gibraltar's defences regularly being improved and increased. This was to protect against faster, steam-powered vessels carrying increasingly more powerful and longer range weapons. The first record of armaments in this area is in 1834 when Mediterranean Battery was established at the north end of the site. With its excellent arc of fire, it could engage vessels approaching from the Mediterranean and counter any attempts by an enemy to land on the east side of the Rock. Due to the steep nature of the terrain, it was difficult to site batteries covering the east side of Gibraltar and installing this battery would have been a challenge. The guns could be transported most of the way to the site along Mediterranean Road, to where the MOD pump house 200 metres to the south, is located today. It then seems likely that the tunnel to its north (shown on the 1865 Rock Model in the Gibraltar Museum) was dug out and the terrace widened, to allow the guns to be hauled into position at this time.

Recorded armaments for the battery are as follows:

- 1834 – One 10 inch brass howitzer and one 24 pounder cannon
- 1859 – One 10 inch brass howitzer and one 32 pounder cannon
- 1863 – One 7 inch rifled breech loader and one 8 inch cannon
- 1885 – Two 7 inch rifled breech loaders, which were removed by 1892
- 1892 – 1940 – Unarmed
- 1940 – Two 4 inch naval guns, removed some time shortly after 1958
- 1942 – Two single Z projectors (anti-aircraft rocket launchers)

The use of a howitzer in the early days is interesting. The howitzer was a powerful weapon, but was designed to fire shells in a high arc to drop on top of an enemy. Here it was sited to provide direct plunging (downwards) fire on any vessel approaching the Rock from the east.

The Fire Control/Searchlight Position (late 19th Century)

Between 1895 and 1897, the area south of the battery was developed as a fire control position. To the south-east and below the area is a large natural cave called Martin's Cave, and the two small caves immediately by the battery (at the north end) were named Martin's Guard Caves 1 and 2 after this. The fire control position took the Martin name, which is why the area is often referred to by both the Mediterranean and Martin's titles.

Because of the peculiar topography of Gibraltar, many positions were required to give coverage all around the Rock, and this was only one of at least ten fire control positions which were built around this time. The Mediterranean Battery site consisted of six concrete structures which housed position-finding apparatus which could give accurate bearings on potential targets. By triangulating the data from the six units, the position of the target could be fixed and artillery fire directed. The central structure had an additional telephone room on the side, so that it could communicate directly with the guns. Each structure had a protective blast wall behind it and an area of the surrounding cliff was concreted over to create a catchment which would collect water for the site.

Later on, two of the position-finding buildings were demolished and replaced with much larger structures to house more advanced range-finding apparatus (Photographs 10 and 11). It is also thought that searchlights were mounted on the site before, or during, the Second World War.

Late 19th Century Searchlight Positions

At the south end of the site are the foundations only of one of the original 1897 position-fixing buildings and its protective rear blast wall. The idea that it was later used as a searchlight position is supported by the fact that a few metres south is a concrete bedding block similar to others found elsewhere in Gibraltar which had searchlight generators mounted on them during WWII.

The northern position (between the two surviving Range Finder buildings) has also been turned into a viewing platform looking east. It also has a concrete bedding block, designated Northern Generator, lying a few metres to its north.

Southern Range Finder (SRF)

This is one of the larger structures which replaced an original 1897 building. It has thick concrete walls and a concrete roof, supported internally by large iron girders, with a wide aperture at the front of the structure. It measures 6.4m x 5.2m x 2.7m. It is intact and in good condition, with only minor concrete damage and rusting of a metal plate. It has been painted internally and the base for the range finder is still in place. Access is down a set of steps.



↑ Southern Range Finder (WWII) looking north



↑ Interior of the Southern Range Finder showing the remaining base of the range finder



↑ Northern Range Finder (WWII)



↑ Interior of the Northern Range Finder

Northern Range Finder (NRF)

This building has same dimensions as the Southern building; and it is in a similar condition, but there is no range finder base here. Access is at ground level, so there are no steps.

Four Inch Gun Foundations (1834-WWII) and Associated Caves

This is the site of the original 1834 battery, but nothing of the original structure is visible today. On the now concrete floor can be seen the mounting bolts for the two 4" naval guns installed in 1940, with the base of a protective wall between them. A plaque on the wall reads:

'These guns, foundations and wall were put up by the men of 4th Heavy Battery, Royal Artillery, September 1940'

The two caves have brick buildings with corrugated iron roofs inside them, appearing contemporary with the 4" guns. They were probably used as troop shelters and ammunition stores.

The area to the north and east of the gun mounts has been turned into a viewing platform, with a bench and a wooden and rope fence round the outside. This gives magnificent views of the east side of the Rock, the Catalan Bay Sand Dune and southern Spain.



←Gun-mount footings and the north viewing platform. The bricked up caves are on the left of the fenced viewing platform.

Northern Upper Structure

This was the central building for the original 1897 fire control position, with one room which held the position finder and the telephone room on the side. Although the walls appear in good condition, the thick metal and concrete roof has collapsed. As a result access has been blocked off but is reversible in the event of a future restoration of this structure.



↑General view of the late 19th-Century Upper Fire Control Structures looking south-east.



↑Northern Fire Control Position.

Southern Upper Structure

This is the only other surviving structure from 1897 and shows what the Southern and Northern Searchlight positions would have looked like when complete. It has thick concrete walls and a concrete roof overlying a thick corrugated metal plate, with an aperture at the front of the structure. It measures 5.1m x 3.9m x 2.4m. The walls are in good condition, but parts of the metal plate in the roof have rusted. As a result access has been blocked off but is reversible in the event of a future restoration of this structure.

Overall Condition

The overall condition of the site is fair to good. The southern structure does have the potential to be repaired and made accessible to visitors in the future, adding to the buildings which have already been renovated at this site.

The searchlight positions and generator blocks are low-lying foundations, so are only noticeable from close range.

The two range finder buildings, although very plain and functional in style, are good, solid structures, which could easily be adapted to provide sheltered rest areas where interpretation material could be displayed.

ADVANCE LIGHT ANTI-AIRCRAFT SITE

Site Name	Advance Light Anti-Aircraft Site		Location	Burma Road
<i>Legal status</i>	Not listed			
<i>Approximate date</i>	WWII	<i>Condition</i>	Good	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	Yes	
<i>Current usage</i>	Military			
<i>Proposed usage</i>	Military			



Following completion of ground works by the Royal Engineers in September 1942, a Bofors 40mm light anti-aircraft (LAA) gun was mounted here on 5th October. The site was further augmented shortly afterwards with the addition of a Z-projector anti-aircraft rocket launcher. The intention was to protect the Rock against air raids during the build-up to Operation Torch, the allied invasion of North Africa in November of that year. The site remained manned until February 1944 and the equipment was removed shortly after, but a gun was later installed post-war and carried out practice-firing in 1953.

The likely position for this site is a platform just outside the entrance to REME Chambers, but there are no visible remains of the battery itself.

← *General view of the likely site of the WWII Advance Light Anti-Aircraft Gun, with circular limestone and mortar walling.*

MONKEY'S CAVE CONVALESCENT HOSPITAL

Site Name	Monkey's Cave Convalescent Hospital		Location	Above sea caves
<i>Legal status</i>	Not listed			
<i>Approximate date</i>	WWII	<i>Condition</i>	Fair to Good	
<i>Stability</i>	Unstable	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	Yes	
<i>Current usage</i>	Gibraltar Museum artefact store			
<i>Proposed usage</i>	Gibraltar Museum artefact store			

Monkey's Cave Convalescent Hospital sits 60 metres above the sea caves (Gorham's and Vanguard Caves), at the top of the access steps down to the caves. It was built in 1942 by the 732nd General Construction Company Royal Engineers, and as also used to access a series of tunnels behind the Hospital. The building was never used as a hospital but was used as a base for the engineers.

It is a four-storey brick structure with concrete floors and a rendered façade, and originally had suspended concrete balconies with steel beam supports on the first and second floors. The building had been disused for some time, and was in a poor condition. The structure is unsafe for permanent use as a public facility but its stable climate makes it a perfect storage facility for museum artefacts.

The appearance of the Hospital façade was considered detrimental to the setting of the nominated Property, and in particular presented a poor visual setting for the sea caves. As a result in 2015 it was decided to carry out safety works and to improve the appearance of the façade. The façade was cleaned and re-rendered and painted in two shades of grey to blend in with the surrounding cliffs. The positions of windows were retained and painted a darker grey to give the appearance of structure rather than a blank façade, with lower floor door in pale grey. The principle of reducing the adverse impact of buildings and infrastructure on the nominated property has been carried through, and now forms part of the MOD's maintenance strategy.



↑ *Monkey's Cave Convalescent Hospital before and*



↑ *after renovation of the façade*

AROW STREET COMPLEX

<i>Site Name</i>	AROW Street Tunnel		<i>Location</i>	East Side above Vanguard Cave
<i>Legal status</i>	Not listed			
<i>Approximate date</i>	WWII	<i>Condition</i>	Good	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	Yes	
<i>Current usage</i>	Military and Civilian (extreme north end)			
<i>Proposed usage</i>	Military and Civilian			

In 1940, there was the very real threat of a Nazi invasion on the strategically important Rock of Gibraltar. To protect the Garrison, a team of military and civilian engineers drilled and blasted out a series of protective tunnels and chambers within the Rock. These would house stores for equipment and ammunition, water and fuel storage tanks, hospitals, kitchens and canteens, plus accommodation for up to 17,000 troops. Between May 1940 and March 1943, over 30 kilometres of tunnels and chambers were built.

In the south-east of Gibraltar, tunnels and chambers were constructed to store ammunition and to provide workshops for mechanical and electrical engineers. Completed on 6th March 1942, this system takes its name from the second Commanding Royal Engineer of Number 3 Tunnelling Group, Lieutenant Colonel A. R. O. Williams, hence the spelling of AROW with a single 'R'.

The tunnel's southern entrance is immediately north of Monkey's Cave Hospital, from where it runs north just inside the cliff for some 700 metres. The tunnel slopes down to the north by some 35 metres over its length. On the seaward side of the main tunnel are a series of apertures, some man-made and others natural caves. During the war, some of these were adapted to house buildings, searchlights and artillery pieces. Galleries to the landward side housed workshops, generators, and access points to other tunnel systems.

AROW Street is mainly Ministry of Defence property though the northern end has been given back to the H. M. Government of Gibraltar and is used by civilian companies for storage.



General views of the AROW Street Tunnel, left looking south towards the entrance by Monkey's Cave Hospital; right looking south in the middle of the tunnel at a passing place for vehicles; the iron cable holders running from the Generator Room show clearly.



Original WWII sign, south end of AROW Street

AROW Street Defence Electric Lights (Archive ID Sites 9, 14 and 16)

Site Name	AROW Street Defence Electric Light Sites – DEL (Survey ID Sites 9, 14 and 16)		Location	East Side
Legal status	Not listed			
Approximate date	WWII	Condition	Good	
Stability	Good	Sensitivity/Value	High	
Vulnerability	Low	Restricted Area	Yes	
Current usage	Military			
Proposed usage	Military			
Description/Notes	The defence electric light (DEL) was a coastal searchlight designed to illuminate and track attacking vessels, so they could be targeted by artillery. It was first developed in the 1890s and was powered by a heavy oil, then later diesel, generator. The 90-centimetre dish produced a 200 million candlepower beam with a range of 5 kilometres. In October and November 1942, three DEL positions, numbered A2, A3 and A4, were completed			

along AROW Street. These were to provide fighting lights for the Caves 6 inch Gun and the Europa Advance 4-inch Gun Batteries. These lights remained in service until 1956.

A2 in Site 16 (number 7 adit): flat concrete floor, blockwork walling, corrugated iron roof remnants in squared-off chamber. Entrance 3.4m wide; length 8m, height 4m. Condition fair, but substantial spalling of concrete. No internal detail features.

A3 in Site 14 (number 5 adit): flat concrete floor, block walling, remnant corrugated iron roof. Iron runners/beams set into floor and extend out over seaward edge. Aperture has 3.8m wide entrance, and is 4m deep and 4.5 to 5m high. Condition fair.

A4 in Site 9 (number 2 adit): flat concrete floor with iron runners for DEL, remnant corrugated iron roof, blockwork walling. Condition fair.



↑ AROW Street entrance to DEL A3 Site 14



AROW Street DEL A3 Site 14



DEL A4, Site 16



DEL A4, Site 16

Sandy Cave DEL Site (Archive ID Site 21)

Site Name	AROW Street Sandy Cave Defence Electric Light Site – DEL (Survey ID Site 21)		Location	East Side
Legal status	Not listed			
Approximate date	WWII	Condition	Good	
Stability	Good	Sensitivity/Value	High	
Vulnerability	Low	Restricted Area	Yes	
Current usage	Military			
Proposed usage	Military			
Description/Notes	<p>The defence electric light (DEL) was a coastal searchlight designed to illuminate and track attacking vessels, so they could be targeted by artillery. It was first developed in the 1890s and was powered by a heavy oil, then later diesel, generator. The 90-centimetre dish produced a 200 million candlepower beam with a range of 5 kilometres. In October and November 1942, three DEL positions, numbered A2, A3 and A4, were completed along AROW Street. These were to provide fighting lights for the Caves 6 inch Gun and the Europa Advance 4-inch Gun Batteries. These lights remained in service until 1956.</p> <p>This is a wide natural cave which opens out on the east of AROW Street towards its southern end. A DEL was positioned here in August 1942. It was a fighting light for the Europa Advance Batteries. Its search arc was from 50 to 180 degrees and it could also be used as an observation light. Numbered A1, It was described as a bombproof light, due to its position inside the cave. At the southern end of the cave is a concrete platform with brick walls on either side. It is thought that this may have been used to test early experimental RADAR on targets over towards Ceuta on the far side of the Strait. The aperture is c 30 m wide and 8 m deep. Brick walls stand up to 6 m high at south end around concrete platform.</p>			



Sandy Cave DEL (upper centre) looking north-east from the platform in front of Monkey's Cave Hospital.



Sandy Cave DEL looking north along AROW Street.



Sandy Cave DEL looking south from the northern part of the position.

AROW Street Gun Positions (Archive ID Sites 10, 11, 13 and 20)

Site Name	AROW Street Gun Positions (Survey ID Sites 10, 11, 13 and 20)		Location	East Side
<i>Legal status</i>	Not listed			
<i>Approximate date</i>	WWII	<i>Condition</i>	Good	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	Yes	
<i>Current usage</i>	Military			
<i>Proposed usage</i>	Military			
<i>Description/ Notes</i>	<p>Introduced in 1910, the 4.5 inch Howitzer was a field gun designed to fire explosive shells in a raised arc. It was used to great effect during WWI, so remained in service afterwards. During WWII, the northern end of AROW Street was a roving gun position for two of these pieces. They could be moved to different apertures to bring fire upon any attacking vessels. Their range was over 6 kilometres.</p> <p>Four apertures which look suitable for these:</p> <p>Site 10 (GR 89480056): Located outside the northernmost aperture on AROW Street is a reinforced concrete block with a flat roof and large window openings on its front and sides. It closely resembles range finder and fire control positions found elsewhere on Gibraltar, but is likely to be a post-war addition, replacing a roving gun position of World War II. The structure is reasonably intact and in fair condition, but there is evidence of rusting of iron beams, plus cracking and spalling of the concrete. Low block work wall to seaward edge.</p> <p>Site 11 (GR 89490049): north end</p> <p>Site 13 (GR 89490047): adjacent to Ammunition Jetty; gated and no access. Water mains present. Fair condition.</p> <p>Site 20 (GR 89390027): narrow aperture, 2m high and 3m wide; low block work to seaward side. Fair condition.</p>			



Roving Gun Position (Site 13)



Roving Gun Position (Site 20)

UPPER SANDY

Scree Anti-Aircraft Searchlight Site (Archive ID Site 4)

Site Name	Scree Anti-Aircraft Searchlight Site		Location	East Side
<i>Legal status</i>	Not listed			
<i>Approximate date</i>	WWII	<i>Condition</i>	Good	
<i>Stability</i>	Good	<i>Sensitivity/Value</i>	High	
<i>Vulnerability</i>	Low	<i>Restricted Area</i>	Yes	
<i>Current usage</i>	Military			
<i>Proposed usage</i>	Military			
<i>Description/ Notes</i>	This site is described in the Royal Engineer's war diaries as being located in Baird's Cave in the Upper Sandy Cave Area, although the exact area is not known. Works for a searchlight in a tunnel were completed in September 1942 and the light itself positioned in November. The light was similar in size and power to a DEL, but was on a completely different mounting. It was mobile, so could be moved inside the tunnel when not in use, but pulled out for action, so it could be elevated up to near-vertical. The dish was also more manoeuvrable, so it could track fast-moving aircraft. A number of sites in the Upper Sandy area were examined and two looked suitable for this equipment although the exact location could not be identified with certainty			

ARCHIVE

The archive comprises completed forms and photographs and is held in the Gibraltar Museum

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Hughes, Q and Migos, A, 1995, *Strong as the Rock of Gibraltar*

Rollo, D, 1990, *Guns on the Rock: The British Artillery Defences of Gibraltar 1704 to 1989*, unpublished report based on the 1958 typescript by Major C B A Hire

APPENDIX 1: EXTRACT FROM GNCE CONSERVATION MANAGEMENT GUIDANCE 1: CONDITION MONITORING AND SURVEYS

SURVEY 19: CONDITION MONITORING FORM: BUILT STRUCTURES

Sheet 1 of

Read the guidance notes before completing the form!

Site Name in full		HER Number
Date	Time	Location/GPS coordinates
Weather conditions		
Inspected by		Signature

Survey type
Purpose

Brief Site Description (add further information and sketch plans on additional sheets)
--

Condition Assessment – overall state (Tick)	1 Poor	2 Fair	3 Good	4 Very Good
Average score from relevant indicator ratings	1.1 to 1.4	1.5 to 2.4	2.5 to 3.4	3.5 to 4
Justification and comments (summarise from indicators on sheets 2-3)				

Recommended conservation or management actions (continue on additional sheet if necessary)	By whom	When

Photographs			
ID number	Fixed point ref.	Direction	Description

Survey 19: Condition Monitoring Form: Built Structures

Sheet 2 of

Survey type	Date	Time	Inspector
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Indicator	Rating (tick appropriate box for each relevant element; use continuation sheets if needed)	
A. Condition of roof or covering structure. To include integrity (completeness, scale) and authenticity (truthfulness/originality)	4	None or very few signs rotting, crumbling, cracking, spalling, corrosion, damage etc. Paint or other finishes in sound condition. No sign of negligence, complete and original features, little or no modification
	3	Small areas rotting, crumbling etc; some evidence failure of paint or other finishes, most key elements present, some signs negligence or damage. 10-40% modified.
	2	Large areas rotting, crumbling etc. Substantial failure paint or other finishes. 50% or more elements, modified, missing or irreparably damaged
	1	Significant loss of fabric, widespread areas of rotting, crumbling etc or heavily modified. Beyond repair, almost totally destroyed or removed
B. Condition of exterior structure - platforms, floors, walls, openings. To include integrity (completeness, scale) and authenticity (truthfulness/originality)	4	None or very few signs rotting, crumbling, cracking, spalling, corrosion, damage etc. Paint or other finishes in sound condition. No sign of negligence, complete and original features, little or no modification
	3	Small areas rotting, crumbling etc; some evidence failure of paint or other finishes, most key elements present, some signs negligence or damage. 10-40% modified.
	2	Large areas rotting, crumbling etc. Substantial failure paint or other finishes. 50% or more elements, modified, missing or irreparably damaged
	1	Significant loss of fabric, widespread areas of rotting, crumbling etc or heavily modified. Beyond repair, almost totally destroyed or removed
C. Condition of external fixtures, fittings or armaments. To include integrity (completeness, scale) and authenticity (truthfulness/originality)	4	None or very few signs rotting, crumbling, cracking, spalling, corrosion, damage etc. Paint or other finishes in sound condition. No sign of negligence, complete and original features, little or no modification
	3	Small areas rotting, crumbling etc; some evidence failure of paint or other finishes, most key elements present, some signs negligence or damage. 10-40% modified.
	2	Large areas rotting, crumbling etc. Substantial failure paint or other finishes. 50% or more elements, modified, missing or irreparably damaged
	1	Significant loss of fabric, widespread areas of rotting, crumbling etc or heavily modified. Beyond repair, almost totally destroyed or removed
D. Condition of interior structure. To include integrity (completeness, scale) and authenticity (truthfulness/originality)	4	None or very few signs rotting, crumbling, cracking, spalling, corrosion, damage etc. Paint or other finishes in sound condition. No sign of negligence, complete and original features, little or no modification
	3	Small areas rotting, crumbling etc; some evidence failure of paint or other finishes, most key elements present, some signs negligence or damage. 10-40% modified.
	2	Large areas rotting, crumbling etc. Substantial failure paint or other finishes. 50% or more elements, modified, missing or irreparably damaged
	1	Significant loss of fabric, widespread areas of rotting, crumbling etc or heavily modified. Beyond repair, almost totally destroyed or removed
E. Condition internal fis/fittings/armaments	4	None or very few signs rotting, crumbling, cracking, spalling, corrosion, damage etc. Paint or other finishes in sound condition. No sign of negligence, complete and original features, little or no modification
	3	Small areas rotting, crumbling etc; some evidence failure of paint or other finishes, most key elements present, some signs negligence or damage. 10-40% modified.
	2	Large areas rotting, crumbling etc. Substantial failure paint or other finishes. 50% or more elements, modified, missing or irreparably damaged
	1	Significant loss of fabric, widespread areas of rotting, crumbling etc or heavily modified. Beyond repair, almost totally destroyed or removed
Notes		

Survey 19: Condition Monitoring Form: Built Structures

Sheet 3 of

Survey type	Date	Time	Inspector
F. Effects of animals, birds	4	No sign of animals or birds damage to site	
	3	Occasional or old signs of animal or bird damage	
	2	Common or fresh signs of animal or bird damage	
	1	Abundant signs of animal or bird damage	
G. Effects of vegetation	4	No sign of vegetation incursion or damage	
	3	Occasional or old signs of vegetation incursion or damage	
	2	Common or fresh signs of vegetation incursion or damage, site partially obscured	
	1	Abundant signs of vegetation incursion or damage, site obscured	
H. Effects of rock falls, landslides, flooding, erosion or subsidence	4	No sign of any effects	
	3	Occasional signs of damage	
	2	Common signs of damage	
	1	Abundant signs of damage	
I. Effects of visitors	4	No sign of visitor impact (trampling, vandalism, graffiti, litter, fossicking etc)	
	3	Occasional localised signs of visitor impact	
	2	Common signs of visitor impact	
	1	Abundant signs of visitor impact	
J. Interpretation on site	4	Interpretation facilities in place, good quality and good condition	
	3	Interpretation facilities in place, could be improved or occasional damage	
	2	Interpretation facilities in place but poor quality and in poor condition	
	1	No interpretation facilities	
K. Health & Safety measures	4	Site safe for visitors without safety measures	
	3	Site safe, with minimal and non-intrusive safety measures in good condition	
	2	Site only safe with care, high level safety measures, in average condition	
	1	Site completely unsafe for visitors (eg structure failing, dangerous access or risk from location)	
L. Management or conservation impact	4	Conservation or management work visible that has improved the condition and integrity of the site or area	
	3	No conservation work or management visible	
	2	Conservation or management work has caused limited, localised damage to site	
	1	Conservation or management work has caused widespread damage or destroyed the site	
M. Impact of structure on property's OUV, directly on attributes (eg physical impact) or indirectly (eg perception or setting)	4	No adverse impact; actual beneficial impact (eg for access or appreciation of elements of OUV; interpretation or viewing platform/point)	
	3	Neutral impact on attributes of OUV or setting, no beneficial impacts	
	2	Minor adverse impact on attributes of OUV or setting (eg obscures viewpoints, minor effect on setting)	
	1	Major adverse impact, major physical or indirect impact on attributes of OUV	
N. Other effects on site or area			

Have management or conservation works recommended in previous visit been undertaken?	Yes		No	
Comments and notes				

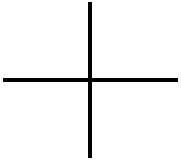
Survey 19: Condition Monitoring Form: Built Structures

Sheet of

Continuation Sheet - sketch plans and elevations

Survey type	Date	Time	Inspector
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Orientation



Notes: