
SITE NAME: **Natural System of Wrangel Island Reserve**

DATE OF INSCRIPTION: 7th July 2004

STATE PARTY: RUSSIAN FEDERATION

CRITERIA: N (ii) (iv)

DECISION OF THE WORLD HERITAGE COMMITTEE:
Excerpt from the Report of the 28th Session of the World Heritage Committee

Criterion (ii): The Wrangel Island Reserve is a self-contained island ecosystem and there is ample evidence that it has undergone a long evolutionary process uninterrupted by the glaciation that swept most other parts of the Arctic during the Quaternary period. The number and type of endemic plant species, the diversity within plant communities, the rapid succession and mosaic of tundra types, the presence of relatively recent mammoth tusks and skulls, the range of terrain types and geological formations in the small geographic space are all visible evidence of Wrangel's rich natural history and its unique evolutionary status within the Arctic. Furthermore, the process is continuing as can be observed in, for example, the unusually high densities and distinct behaviours of the Wrangel lemming populations in comparison with other Arctic populations or in the physical adaptations of the Wrangel Island reindeers, where they may now have evolved into a separate population from their mainland cousins. Species interaction strategies are highly-honed and on display throughout the island, especially near Snowy owl nests which act as protectorates for other species and beacons for migratory species and around fox dens.

Criterion (iv): The Wrangel Island Reserve has the highest level of biodiversity in the high Arctic. The island is the breeding habitat of Asia's only Snow goose population which is slowly making a recovery from catastrophically low levels. The marine environment is an increasingly important feeding ground for the Gray whale migrating from Mexico (some from another World Heritage site, the Whale Sanctuary of El Vizcaino). The islands have the largest sea-bird colonies on the Chukchi Sea, are the northernmost nesting grounds for over 100 migratory bird species including several that are endangered such as the Peregrine falcon, have significant populations of resident tundra bird species interspersed with migratory Arctic and non-Arctic species and have the world's highest density of ancestral polar bear dens. Wrangel Island boasts the largest population of Pacific walrus with up to 100,000 animals congregating at any given time at one of the island's important coastal rookeries. Since Wrangel Island contains a high diversity of habitats and climates and conditions vary considerably from one location to another, total reproductive failure of a species in any given year is practically unheard of. Given the relatively small size of the area, this is very unusual in the high Arctic.

BRIEF DESCRIPTIONS

Located well above the Arctic Circle, the site includes the mountainous Wrangel Island (7,608-km^2), Herald Island (11-km^2) and surrounding waters. Wrangel was not glaciated during the Quaternary Ice Age resulting in exceptionally high levels of biodiversity for this region. The island boasts the world's largest population of Pacific walrus and the highest density of ancestral polar bear dens. It is a major feeding ground for the gray whale migrating from Mexico and the northernmost nesting ground for 100 migratory bird species, many endangered. Currently, 417 species and sub-species of vascular plants have been identified on the island, double that of any other arctic tundra territory of comparable size and more than any other Arctic island. Some species are derivative of widespread continental forms, others are the result of recent hybridization, 23 are endemic.

1.b State, Province or Region: Chukot Autonomous Area

1.d Exact location: N71 11 20.0 W179 42 55.0

WHC Registration
26/02/2004
N 1023 Rev
#01

Nomination

«NATURAL SYSTEM OF «WRANGEL ISLAND» RESERVE»

For inscription into the

WORLD CULTURAL AND NATURAL HERITAGE LIST OF UNESCO

Prepared by:

Directorate of «Wrangel Island» Reserve

In cooperation with:

Management of Protected Territories and Animal World of Chukotkski Autonomous Region Administration

With support of:

World Wild Fund (WWF)

Greenpeace Russia

2003

Contents:

1. Identification of the Property

A) Country Russian Federation

B) Region Chukot Autonomous Area

C) Name of the site Natural system of «Wrangel Island» Reserve

D) Geographical position Proposed area includes State Nature Reserve «Wrangel Island». The Reserve includes Wrangel Island (70°28'12''- 71°21'02''N.; 178°45'59''E- 177°15'52''W), Herald Island (71°12'53''- 71°N; 175°19'16''- 175°27'47''W), as well as a strip of water in the Chukchi Sea and East Siberian Sea areas 12 marine miles around each island. Location of the proposed area and its boundaries are depicted on maps enclosed in attachments A1 and A2.

E) Maps and/or schemes, indicating boundaries of the area proposed for inscription and the buffer zone

Attachment A contains the following maps:

1. «Wrangel Island» State Nature Reserve location.
2. «Wrangel Island» State Nature reserve Zones.
3. Geography and infrastructure of Wrangel Island.
4. Landscape units of Herald Island.
5. Most important flora and vegetation areas of Wrangel Island.
6. Wrangel and Herald islands birds important habitats.
7. Wrangel and Herald islands mammals important habitats.

F) Size Total area of the proposed site amounts to 19,163, km^2, including: terrestrial part – 7,620 km^2 (7608.7 km^2 – Wrangel Island and 11.3 km^2 – Herald Island), marine water area – 11,543 km^2.

2. Justification for Inscription

A) Value of the object Wrangel and Herald Islands represent an anomaly of biodiversity and display the most extensive variety of flora and fauna species in the whole Arctic, having no analogue in numbers of vegetation, insect and bird species, as well as in its diversity of plant communities.

At the same time they appear as the largest contemporary refuges for Pleistocene floral and fauna elements, previously widespread on drained shelf areas of the Bering region and having migrated through them from Asia to America and back. The Island flora and fauna are characterized by the blending of typically Arctic and relatively more southern Asian and American taxons, with considerable share of elements of Central Asian origin. Among plant communities of the Islands relic sub-species are represented that are supposed to have been dominating in the North of Bering Dry Land in Pleistocene. In some places these communities are dominating in the landscape which makes these islands appear as the most similar to ancient Pleistocene landscapes of all the present day ones.

The flora and fauna account for about 40 endemic species and

subspecies of vascular plants, insects, birds and mammals (lemmings). Some of them are relic species and are indicated on the list of species of the Earth (See Description) which are on the verge of extinction. Also, unique endemic plant communities and even unique soil types are found here.

Landscapes of the island are exceptionally diverse and embrace almost all of the landscape types characteristic of the islands of the Arctic basin (with the exception of glacial), including both intrinsic Arctic tundra and unique Arctic shrub tundra and steppe tundra landscapes.

The Islands and the adjacent waters represent a key area for a whole range of rare and endangered animal and bird species. The area embraces the highest concentration of polar bear family dens, feeding grounds of the main part of the Pacific walrus population, as well as its largest terrestrial rookeries north from the Bering Strait, and the largest colonies of marine waterfowl in the Eastern Arctic. Wrangel Island hosts the biggest colony of the snow geese in Asia. It is also one of few areas of concentrated presence of Pacific Brent geese and nesting grounds for Sabine's gull.

Particular value is added to the Islands by the fact that during the whole Cenozoic Era these lands were never completely underwater and did not experience glaciation, which means that the natural systems of this land are the results of continuous, uninterrupted evolution since the late Mesozoic times. Never being subjected to serious human impact, the Islands have been well preserved as an integral natural complex. And finally, the Islands have extremely rich paleontology and also retain unique archaeological monuments (see Description).

B) Comparative analysis

Compared to other territories of the Arctic basin the Wrangel and Herald Island are marked by incomparably higher diversity of flora and fauna, a large number of endemic and relic elements therein, as well as a high diversity of landscapes and plant communities.

C) Authenticity / Integrity

Being isolated Island systems, the Wrangel and Herald Island are completely integral natural systems, including all of the forming key elements and interrelations. Integrity of the object is increased due to inclusion of vast tracts of water area adjacent to the Islands. The land and water areas are used by multiple bird and mammal species that breed on the island. As an outcome of the re- introduction to two species of Arctic hoofed animals which used to populate the islands in the recent past, the natural complex of Wrangel Island has become even more "comprehensive".

D) Criteria, according to which the object is nominated for inclusion

The natural system of «Wrangel Island» Reserve is nominated on the basis of the following criteria:

- **N (ii)** Proposed object represents an outstanding example of evolutionary development of various Arctic natural systems (mountainous, valley, coastal) during the whole Cenozoic Era, in the circumstances of periodical isolation and contact with two continents, Eurasia and North America.
- **N (iv)** The territory possesses an exceptional biological diversity for an Arctic area, as well as all the conditions required to ensure its actual protection. The above area also

contains habitats of rare, endangered and specially protected species of global importance (over 40 endemic species and subspecies of plants and animals, including relic and extremely rare ones: polar bear, pacific walrus, marine waterfowl, Brent goose etc.- see Description).

3. Description

A) Description of the object

In line with contemporary understanding of natural zones of dry land, the climate, landscape and vegetation features of the Wrangel and Herald Island allow classifying the two as being a part of the Arctic tundra sub-zone, the northernmost sub-zone of tundra. It is the only area belonging to this sub-zone in the entire Bering region of the Arctic, including the Chukchi Peninsula in Asia and Alaska in North America.

Geology

In geological perspective, the Wrangel and Herald Island are parts of the epi-Baikalian Hyperborean platform, formed by Cimmerian (Mesozoic) folding. In Precambrian times this platform was a part of the Canadian Shield, while presently it is noted through relic platform structures, shaped as unevenly lifted blocks characterized by continental type of Earth crust. One of them corresponds to Wrangel Island, and another one correlates with the uplift of Herald Island. The territory of the Island is composed by rocks belonging to three different stratigraphical units: a) ancient metamorphic, described as “Wrangel complex” and consisting of crystalline shales of Proterozoic and Early Paleozoic age; b) Paleozoic terrigenous and carbonate complex, consisting of various sedimentary rocks (limestones, marlstones, sandstones, siltstones, etc.) and metamorphic products of the aforementioned; c) Upper Tertiary terrigenous complex, represented by mudstones, siltstones and dark shales. Moreover, evidence of magmatism (igneous rocks) is noted. Both basic (gabbro) and siliceous (granite) rock bodies, most of them correlated to metamorphic complex, which stands for their fairly old age, are present. Quaternary deposits, largely resulting from cryogenesis largely overlay the bedrock.

Relief

In geomorphologic aspect, the central part of Wrangel Island terrain is shaped as eroded and denuded middle mountains with obvious traces of nivation and cryogenic processing. This part overlooks the whole island and reaches heights of 1096 m above sea level. The slopes of middle mountains from top to foothills are enveloped with detritus, forming screes, consisting of heterogeneous detritus. The middle mountain massif is strongly dissected by multiple valleys. Mountaintops are shaped as plateaus, except for a few higher Alpine type structures. On the West, North and South the middle mountains are surrounded by a belt of eroded low mountains and hills, which basically are strongly dissected peneplains from 200m to 600m above sea level. The low mountains are also strongly dissected by valleys, with the largest valleys forming spacious intermontaine depressions. From North to South, the mountain structures of the Island are framed with constructional plains, predominantly composed by alluvial sediments, with gently sloped ridges reaching 15 m above the general level. Abundance of sand and pebble-

composed spits and bars mark the flat lagoon-type shores of the Island. In places where mountain structures are on the seacoast, various abrasive banks characterized by rock escarpments and cliffs a few tens of meters high are formed. General features of Wrangel Island's macro relief are depicted on the appended map (Attachment A3). Herald Island is a high granite and gneiss residual mountain with sheer cliffs up to 250 m high facing the sea on any side of the Island (attachment A4). Various cryogenic micro relief and nano relief forms, dominated by polygons and spot-like forms, are typical for both islands. Thermal karst basins are developed within the low part of plains of the Wrangel Island and cemetery mounds, formed as a result of thawing of polygonal ground-ice wedges are formed in intermontaine depressions.

Hydrography

The hydrographic network of Wrangel Island consists of approximately 1400 rivers of over 1 km in length and 5 rivers are over 50 km long. The Island accounts for 900 lakes with a total surface water area of 80 km^2. The majority of the lakes are concentrated within the northern plain of the Island. Most lakes have originated through thermal karst processes, at the same time some larger lakes have developed from lagoons and through coastal damming.

The waters of the East Siberian Sea and the Sea of Chukchi surrounding the Wrangel and Herald Island are classified as a separate Wrangel chemical oceanographic region. These waters are characterized by their specific type of surface waters that have almost the lowest salinity in the Arctic basin combined with high oxygen content and increased content of biogenic elements. Warm Pacific waters delivered from the Bering Sea form a distinct layer at a depth of 75 m to 150 m. At a depth of 150 m the northern part of the water area receives warm waters from the Atlantic.

The ice regime of the water area adjacent to the Islands is described by almost constant presence of ice during the summer period. The distribution line of drifting ice during their minimum distribution period is located either in direct proximity of the Islands or little bit further towards the northeast (in exceptional cases much further north). An ice massif known as the Wrangel Massif is preserved in Longa Strait throughout the entire warm period. In summer an offspur of the Ajon oceanic ice massif is situated in the East Siberian Sea not far from Wrangel Island. Zavrangelevskaya stationary lead is located north or northeast of the Island throughout the winter season.

Climate

The Arctic climate of the Island is largely formed at an Arctic front. Arctic air masses, characterized by low temperatures and low moisture and dust content travel over the Islands' most of the year. In summer they are displaced by warmer and wetter Pacific air masses and sometimes by dry and dusty continental Siberian air masses. Substantial thermal differences exist within the Islands and are preconditioned by terrain features. This way, in different points of the southern coast, the average July temperature varies from 2.4 to 3.6°C, which is typical for the sub-zone of Arctic tundra. On the north coast similar indicator varies from 1°C (as found in polar deserts), while in intermontaine hollows of the central part of the Island the temperature reaches 8 -10°C, a typical value for southern outskirts of the tundra region. The peculiar thermal regime

of the intermontaine hollows is preconditioned by their protection from cold and wet winds, as well as by frequently recurring foehn winds causing sharp temperature increases.

The frost-free period on the island is very short, usually not exceeding 20-25 days, and more often totals up to about two weeks. Strong and continuous northeast winds with speed often exceeding 40 m/s are typical for winter periods. Annual precipitation on the Island is around 200 mm, usually accumulating as snow, and a considerable part of the snow is blown away by winds in the absence of incoming wind-brought snow. As a result, the amount of moisture received by the Islands does not exceed 115-200 mm, which is close to a minimum value for the Arctic region.

Mezoclimatic differences, manifested through stronger continental features of the climate of the central part of the Island (especially interior parts) compared to west and east coast sectors, are well developed on the territory of the Wrangel Island. The western and eastern parts of the Island are described by lower summer temperatures, later snow melting and much more frequent occurrences of overcast and foggy days.

Soils

Soil covers on the Islands are fairly well developed. The arctic tundra sod and tundra soils or arctic gleysolic soils are dominant in better drained and more hydromorphic landscape elements. Along with this feature, and, completely unusual for Arctic Islands are the appearance of cryoarid steppe and tundra steppe soils. These soils are normally characteristic of continental regions of Siberia and northern areas of the Russian Far East, and are widespread in the more continental central parts of the Island. Under the name of arctic tundra are saline soils that are typical solonchaks of lithogenic origin, which means emergence due to an existing exudational regime. These soils are typical for arid areas and completely non-typical for the Arctic. And finally, descriptions of arctic tundra carbonate soil types, which are fairly widespread in the central parts of the Island and appear as endemic for the Wrangel Island.

It should be noted that extremely well developed zoogenic peaty humus soils are formed in places of marine waterfowl colonies in some parts of Herald Island. These soils facilitate strikingly lavishing vegetation cover, very unusual at the 100-200 m elevation level on a small arctic island.

Flora

The flora of the Ostorov Vrangelya is unique in its richness and level of presence of endemic plants. Presently 417 species and subspecies of vascular plants (Appendix B1) have been noted on the Island, which is more than in the entire Canadian Archipelago and about 2-2.5 times more than on any other arctic tundra territory of a comparable size. By the number of noted moss species (331) and lichen species (310) the Island occupies a leading position in the arctic tundra sub-zone and, as in the case with vascular plants, is approaching the regions qualified as typical tundra.

Among the vascular plants 23 taxons (species and subspecies) are endemic for the island (Appendix B5). Such an abundance of endemic plants is unmatched by other Arctic islands, including Greenland. Some of endemic plants which are quite typical for the Island (Oxytropis ushakovii, Papaver multiradiatum, Papaver chionophilum) are derivatives

of widespread continental forms. Some other plants are more or less scarce and likely represent products of recent hybridization, like Potentilla ushakovii, noted in only one place, as well as a few poppy species. Alternatively, these species may be relics of previous epochs widespread on the shelf areas in the past. The most interesting among the relics include Potentilla Wrangelli, Oxytropis uniflora and Hierochloe wrangelica which grow in one restricted area only (upper reaches of the river Neizvestnaya), where each of them is represented by a few micro populations. Hierochloe wrangelica, for which only 6 micro populations with an area ranging from 3 to 20 m^2 are known, can certainly be referred to as one of the rarest plants of the world. Endemic environmental races, identified as separate taxons and replacing the environmentally different continental forms (Senecio hyperborealis ssp. wrangelense) on the island or growing together with them, but in new ecotype conditions (Trisetum wrangelense), are also interesting. Aside from endemic plants, flora of the Island accounts for a few subendemic forms, that are typical for the Island and in small quantities are found in individual points of the continental Chukchi Peninsula (Oxytropis wrangelii).

Another interesting trait of the Island flora is the presence of a series of American species unknown in continental Asia (Cardamine purpurea, Gentiana arctophila) and of relatively southern, hypoarctic and boreal species that, as a rule, are not encountered on the Arctic Islands (Ledum decumbens, Pyrola rotundifolia, Eleocharis acicularis etc.). The area also includes meadow-steppe and steppe plants (Potentilla arenosa, Festuca lenensis etc.), as well as a number of mosses penetrating northeastern Asia, but absent in other arctic tundra areas. Among the latter plants Carex duriuscula is of particular interest. It is presently the dominating species in the dry steppes of Central Asia and Yakutia and is found in three remote areas of the Island (Appendix A5). Two of the last groups can be considered relics of preceding epochs with a warmer and more continental climate that has been maintained to present day along with relic endemic forms due to the special mezoclimate of southern parts of the Island (mainly its intermontaine hollows with continental climatic conditions).

Vegetation

Vegetation of the islands is very diversified and combines traits that are typical for arctic tundra sub-zones and completely unique features. Various types of spotty and polygonal tundra that are considered to be an arctic tundra subtype of the tundra vegetation belt are dominant on the Island. More or less dispersed low shrub, herbaceous and lichen communities of talus and scree slopes are widespread in the mountains, and on plateau surfaces phytocoenoses similar to the ones of polar deserts are formed. Altogether it makes up a complex of plant communities that are typical for the arctic tundra subzone, the peculiar traits of which include domination of relatively dry, low shrub and herbaceous-meadow-low shrub vegetation varieties over mossy hillock communities. Aside from that, the peculiar nanorelief of dryad hummock communities, having no analogy to their composition and structure in the Arctic and endemic to the Island, have been noted there.

Aside from typical arctic tundra some plant communities with a much more southern appearance, similar or identical to subarctic communities, are represented on the Island. The latter communities

embrace a variety of tundra meadows, Cassiopeia dominated tundra, swamp with hypoarctic sedge and rush species, as well as true shrub tundra communities and thickets of flood plain bushes absent on any other arctic islands of the arctic tundra subzone. Mountains restrict the vegetative community in central and western parts of the Island. In these areas they occur in large intermontaine hollows and valleys.

One other complex of plant communities, non-typical for arctic tundra, is spread in the mountain areas and on southern macroslopes of mountain structures. These are various phytocoenoses with large participation of xerophilous and mesoxerophitic species of the meadow and meadow-steppe environments. So-called tundra-steppe communities are co-dominated by arctic shrubs (dryads, willows) and xerophilous herbs are most common.

Aside from that, fairly variable groups encountered in the warmer regions could be referred to as steppe-like meadows. Also, entirely unique for the Arctic are xerohalophitic plant communities which are attached to solonchaks. And finally, limited areas of true steppe communities are represented on the island. This makes the Wrangel Island different from all other arctic islands. Isolated steppe communities belong to two main types: herbaceous-grass communities, dominated by meadow grass (Poa arctostepporum), and steppe communities dominated by steppe sedges (Carex obtusata) and (Carex duriuscula), the latter are domineering elements of present-day steppe phytocoenoses of Mongolia, Buriatia and Yakutia. Unique plant communities dominated by fabaceous with a large variety of the former including xerophilous forms, also belong to this complex and have been noted and described only in the upper reaches of the Neizvestnaya river.

The last two complexes described are considered to be relics of the Island, where they supposedly dominated during the cryoxerophitic epochs of the Pleistocene (the second xerophilous complex) and the relatively humid warm periods of the Holocene (the first subarctic complex). Just like the relic species, the complexes have been preserved here due to exclusively favorable circumstances in the central areas of the Island. Appearance of the landscapes of internal parts of the Island is considered to be the most similar to landscapes that dominated in the Pleistocene on the vast spaces of drained continental shelf. The area of the upper reaches of the Neizvestnaya river is noted specifically as the most representative area of the relic plant communities and complexes and this is where the majority of populations of relic and endemic species is concentrated. This makes the area a unique refuge of Pleistocene and Early Holocene vegetation and flora.

Fauna

The fauna of terrestrial invertebrates, which requires further study and analysis, manifests the same regularities as those of vascular plant flora. Firstly, there is an unusual diversity of species. There are 31 spider species, 58 beetle species and no less than 42 butterfly species noted in the area (Appendix B2), which is considerably richer than the same groups of other arctic tundra areas, including the continental part. The outstanding variety of leaf beetles (7 species) and snout beetles (11 species) is noted in particular. Secondly, the arthropod fauna of the island, as well as the flora, includes the elements of relatively southern groups, that are normally absent in arctic tundra. These include the various

Orthopterous of Delphacidae, Aphalaridae, Aphididae families, Melyridae, Coccinellidae, Lathiridae beetles etc. Furthermore, the insect fauna of the area is characterized by the same unusually high endemicity. Presently there is no other place where 12 taxons (species and subspecies) of the island insects are noted (Appendix B6), including 3 leaf beetle species, 2 snout beetle species, the soft-winged flower beetle (Melyridae) and psylla (Aphalaridae). Just like among endemic plants, among the insects there are some fairly common ones (Apion wrangelianum, Chrysomela blaisdelli wrangeliana), and extremely rare ones, discovered from single biotopes (Aphalara arctica, Troglocollops arcticus). And finally, the fauna of terrestrial invertebrates, as well as the flora, is vividly traced with American and/or Central Asian relations that are manifested through a number of endemic forms very similar to either American or Central Asian species. Among them there are species still populating the steppe regions of Central Asia (Coniocleonus astragalli, etc.).

At the same time, as in the case with flora, all of the typical arctic forms and taxons are well represented in the fauna and sometimes are dominant, providing for quite an arctic make-up of the fauna.

The fauna and invertebrate population of coastal water areas of the islands leaves plenty of room for further studies. However, even the most preliminary research has shown that benthic communities in the lagoons of the southern coast of Wrangel Island differ from typical ones for the arctic basin due to their warm-watered character, which has to do with pacific water masses penetrating this area.

Avifauna

There are 169 known bird species for the Islands and adjacent water areas (Appendix B3). Most of them are migratory birds. As well, 62 nesting bird species have been identified, including 8 marine bird species. This is an impressive number for an Arctic island. The basis of avifauna is made up by tundra species, most of them having circumpolar distribution areas and appearing as background elements of the Arctic tundra. These include the Lapland longspur (Calcarus lapponicus), (Plectrophenax nivalis), grey plover (Pluvialis squatarola), (Arenaria interpres), robin sandpiper (Calidris canutus), and others. At the same time, there is nesting of non-arctic species such as Philomachus pugnax, the curlew sandpiper (Calidris ruficollis), Fratercula corniculata, the puffin (Lunda cirrhata) and the arctic willow warbler (Phylloscopos borealis) for which Wrangel Island appears to be their northernmost nesting point.

Wrangel Island is the location of the only large permanent snow goose (Chen caerulescens) colony in the Arctic. Aside from the colony, during favorable years the snow geese nest on other parts of the Island. Some small numbers of Brant goose (Branta nigricans) also nest on the Island, while every year several thousands of non-nesting or unluckily nested birds are concentrated on the Island as they fly to the Island from continental Chukchi Peninsular and from Alaska to spend mew time there. The common eider (Somateria mollissima) and king eider (Somateria spectabilis) are common on the island and limited numbers of Steller's eider (Polysticta stelleri) are also encountered.

The largest bird colonies in the Chukchi Sea with total numbers of up to 250-300 thousand nesting birds are situated on the Island. Among the nesting birds the following are prevailing: thick-billed guillemot (Uria

lomvia), short-billed guillemot (Cepphus grylle) and kittiwake (Rissa tridactyla). Also, typical representatives of North Pacific marine avifauna, such as pelagic shag (Phalacrocorax pelagicus), (Fratercula corniculata), puffin (Lunda cirrhata) and common guillemot (Uria aalge) also nest there.

Among other rare and endangered species nesting on Wrangel and Herald Islands are arctic falcons (Falco rusticollus) and peregrine falcons (Falco Peregrinus), as well as the North American buff-breasted sandpiper (Tryngites subruficollis). For the latter the Islands represent one of a few famous nesting grounds in Asia. Sabine's gull (Xema sabini) is a common bird on the flood plains that are abundantly pierced with small lakes. Regular migratory movement or temporary concentrations of Ross's gull (Rhodostethia rosea) and ivory gull (Pagophila eburnea) is noted near the Island coasts during the fall. An overwhelming majority of the world's population of Ross's gull migrates along the south coast of Wrangel Island in September-October.

Specific traits of the Island avifauna include the fact that local populations of Plectrophenax nivalis and the short-billed guillemot (Cepphus grylle) are described as independent species (Appendix B6), while the robin sandpiper (Calidris canutus) is referred to as a subspecies distributed in a limited area of west Alaska.

Terrestrial mammal fauna of the Islands is quite scarce and consists of only 3 common aboriginal species, namely the arctic fox (Alopex lagopus) and two lemming species (Appendix B4). Nevertheless, the latter two appear as species and subspecies endemic to the Island (Appendix B6) and are quite different from the continental population in terms of both morphology and genetic features. Wrangel Island is habituated by a limited number of wolverines (Gulo gulo) and is periodically visited by wolves (Canis lupus).

Aside from these species, in the 1940s domesticated reindeer were introduced to Wrangel Island. By present time, the species has fully integrated into the wilderness. At the end of the 1970s, the musk ox was introduced and it's present numbers account for a few hundreds of heads. According to paleontological data, both species habituated the area in the late Pleistocene, and reindeer even later (2-3 thousand years ago).

Together, Wrangel and Herald Islands comprise an area with the highest concentration of ancestral dens of the polar bear (Ursus maritimus). Every year the dens are occupied by 300 to 600 females of the above species, including 100 ancestral dens situated on Herald Island. During the winter-spring period polar bears are very numerous on the ice and waters of areas abundant in Pinnepedia. And in the fall in case of free water they often form large concentrations on the coast near the walrus rookeries, and in areas where dead whales are washed ashore. In these areas, up to 120 animals of both sex can be found simultaneously.

Ichthyofauna

Among the Pinnepedia, the pacific walrus (Odobenus rosmarus) is the most numerous habitant of the water area adjacent to the Islands. These waters represent a critical summer feeding grounds, where an overwhelming majority of the females and youth of the walrus population can be found from July to September-October. Where possible, walruses stick to the ice, but in its absence the largest coast rookeries are formed where 80-100 thousand animals can be found at any given time. Aside

from walrus, ringed seal (Phoca hispida) and bearded seal (Eregnatus barbatus) are common in the coastal water area.

During the summer-fall period the waters surrounding Wrangel and Herald Island act as feeding grounds and migration areas for the whales, among which the gray polar whale (Eschrichtius gibbosus) is the most abundant and the white whale (Delphinapterus leucas) is less so. The great polar whale (Balaena mysticetus), humpback whale (Megaptera novaeangliae) and the finback whale (Balaenoptera physalus) are also found in this area.

Wrangel Island is also an interesting and important area due to its paleontology. The plains in particular are abundant in the remnants of the Pleistocene and Holocene mammals such as the furry mammoth (Mammuth primigenius), the primeval bison (Bison priscus), Prjewalski's horse (Equus caballus) and other species. The Island also has shown evidence of bones and horn of the furry rhinoceros (Coelodonta antiguitatis), earlier unknown to be found any further east than the westernmost point of the Chukchi Peninsular. The most interesting finding has to do with the pigmy mammoth, described as a new and to date unknown subspecies (Mammuth primigenius wrangelensis). The remnants of the pygmy mammoth have been dated to 7 to 3.6 thousand years ago, meaning the Holocene time period, which is some 6 thousand years after the official extinction of the species.

Archaeological sites are also present on Wrangel Island. There is a Neolithic camp of marine hunters that dates back to 3.4 thousand years ago. It is located on the bank of the Krassin Bay, by the so-called Devil's Ravine.

B) History and Development

The territories of Wrangel and Herald Islands, with the exception of the low plains areas of Wrangel Island, have remained in a dry land state throughout the entire Cretaceous period and Cenozoic Era. During powerful Pleistocene transgressions, the Islands were separated from the continent more than once. During regression periods, coincident with glaciation epochs, these areas were part of a vast Bering Continent, which used to unite the shelf of the East Siberian, Chukchi and Bering Seas and formed a land bridge between Asia and North America. The area of the contemporary Islands was almost in the center of Arctic part of the Bering continent, and was situated north of the present-day Bering Strait. It is critical that the Islands were not covered by glaciers in the Pleistocene, although a few traces of mountain valley glaciation only are found in the central part of Wrangel Island. As well, they were not been completely flooded either (transgressions only covered the plains and occupied a little less that half of their space). It means that the organic world of the Islands has been evolving uninterrupted since the end of the Mesozoic Era.

During periods of the Bering Continent's existence, the territory of the present Islands was located at the crossroads of plant and animal migration streams directed from Asia to America, from America to Asia and from Central Asia to the Arctic area. This was due to the existence of an integrated "tundrasteppe" hyperzone stretching all the way from arid central regions to areas in the high latitudes of Eurasia and North America. As it is viewed nowadays, this was the center of the largest area

of evolution of contemporary Arctic biota. During transgressions, when much of the continental shelf was covered by water, the Islands functioned as refuges for many species and communities spread on previously drained shelf area. Furthermore, periodic isolation facilitated species-forming processes on the islands themselves. All of the above factprs contributed to the initially high biodiversity of the area.

The latest separation of the Islands from the continent took place about 10,000 years ago and coincided with the global restructuring of Arctic landscapes and the massive expansion of hypoarctic flora and fauna towards the North. Due to the isolation of the Islands, the latter change was weakly expressed on their territory, and, together with their physical and geographic peculiarities (landscape diversity along with continental conditions in refuges) it ensured the survival both of multiple relic elements of some species and entire communities in others. Along with that, due to the biodiversity, relatively more heat-loving elements have survived here, which had penetrated the Island and other similar areas during the transitional times between the Pleistocene and Holocene, but in most cases had disappeared as a result of a late Holocene cool spell. Large mammals had been preserved on the Island until the middle of the Holocene, including local mammoth subspecies extinct over the course of the last 5-2 thousand years only.

About 3.5 thousand years ago marine hunters that were considered to be a part of the Paleoeskimo culture populated the island. The results of the studies of the only Neolithic camp found on the south coast of Wrangel Island contain evidence of the use of exclusively marine resources by the ancient population (no remnants of terrestrial animals were found in the cultural layer). By the time Wrangel Island was discovered by the Europeans there was no aboriginal population. No traces of the presence of large terrestrial animal were found either.

Wrangel Island was actually discovered by the American whale hunter Thomas Long, in 1867. However, the first debarkation to the Island did not take place until 1881. It was the crew of another American ship, the “Corvin”, which was under the command of Lieutenant Berry that set foot on Wrangel Island (Captain Kellet had disembarked to Herald Island in 1849 while searching for the lost expedition of Sir John Franklin). The first Russian expedition reached the Island on the ship “Vaigach” in 1911 and established the Russian flag there, and in 1916 the Tsar’s government declared that the Island belonged to the Russian Empire. In 1924 a military ship, the “Krasnyi Oktiabr”, established a Soviet flag on the Island and two years later a resolution by the Soviet Government included the claim of sovereignty for Wrangel Island. In turn, this led to the establishment of a meteorological station and the first permanent settlement on the Islands.

The first residents moved to the island in order to establish hunting areas were the indigenous people from the Eastern Chukchi area. Hunting for arctic fox, walrus, polar bear, snow geese, Pacific Brant geese and other animals had been opened up from the time of their arrival. In 1948, a small herd of domestic reindeer was introduced and a branch of a reindeer-herding farm was set up as well. Aside from the main settlement in near Rogers Bay (Ushakovskoe) in the 1960s, a new settlement named Zvezdnyi was established in the Somnitelnaya Bay area, where ground runways reserved for military aviation purposes were constructed (these

were abandoned in the 1970s). Moreover, a military radar installation was buitd at Cape Hawaii. Rock crystal mining had been carried out for a number of years in the center of the Island near Khrustalnyi Creek. At the time, a small settlement had been established nearby to house the miners, but later on it was completely destroyed.

In 1953 the Administrative Authorities adopted a resolution on the protection of the walrus rookeries at Wrangel Island. In 1968, a reserve for the protection of walrus, polar bear, and snow geese nesting sites, as well as the Pacific Brant goose and other sea bird colonies was established on the Island. When the musk ox species from the Nuniwak Island was introduced to the Island in 1975, the Executive Committee of the Magadan Region allocated the grounds of Wrangel Island for the future establishment of a Reserve (Appendix C3).

Resolution of the Council of Ministers of the RSFSR #189 was adopted on March 23, 1976 for the establishment of the state Reserve "Wrangel Island" for the purpose of conserving the of unique natural systems of Wrangel and Herald Islands (Appendix C4). On December 26, 1983 the Resolution of the Magadan Regional Executive Committee on establishment of 5-kilometre protective belt around the Island was signed (Appendix C5). By the 1980s, the branch of the reindeer-herding farm on the Island had been abolished and the settlement of Zvezdnyi was virtually abandoned. Hunting had already been stopped, except for a small quota of marine mammals for the needs of the local population. In 1992, the radar installation was closed and only the settlement of Ushakivskoe remained occupied on the Island.

In 1997, following a joint proposal by the Governor of Chukchi Autonomous Region and the State Committee for Environment of the Russian Federation (Appendix C6), the Reserve area was enlarged by means of incorporation into its territory a 12 marine mile wide water area adjacent to the Islands. This was in line with governmental provision #1623 dated November 15, 1997 (Appendix C8). And around the water area of the Reserve, a 24 mile wide protective zone was established according to Resolution #491 by the Governor of the Chukchi Autonomous Region, dated May 25, 1999 (Appendix C7).

C) Format and date of the latest site data

The latest records regarding the site are provided in a book format register of the Reserve (see "Monitoring" section) named "Nature Chronicles" for 1988. Copies of this book are kept in the Reserve and in the Administration for Conservation of Goskomecology, RF.

D) Present-day status of the site

The contemporary condition of the natural complex of the site is described in paragraphs a) and b) of this section. Administration of the Reserve has been transferred to the settlement named Mys Shmidta on the continental coast. Only one settlement is left on Wrangel Island and this is where a meteorological station, frontier post and Reserve quarters are concentrated. There are large areas of local contamination that need to be cleaned up, but these areas pose no threat for adjacent areas. The ruins of buildings and metal scrap dumps are left in places such as the Zvezdnyi settlement and the radar installation facility at Cape Hawaii.

E) Policy and programs

Since the beginning of the 1990s, the Reserve has been signing agreements with leading television and movie companies (BBS, Survival

related to presentation and advertising of nominated object

Anglia, NHK) on shooting of films about the nature of the Reserve. These films are presently being shown on television in many countries worldwide. In order to draw attention to the Reserve, a booklet dedicated to Wrangel Island was published in 1999. Translation of the booklet into Russian is presently underway. There is also work-in-progress on a book about the nature of the Islands, which is intended for the general public and it is expected to be published in 2001 to mark the 25th anniversary of the Reserve. In the future, shooting of Reserve profile films will be continued. To aid in developing tourism on the Island, a brief guide and a series of leaflets are expected to be published which will be dedicated to individual objects, plant and animal species of the Reserve that are of the most interest and value.

4. Management

A) Ownership

The grounds and waters of Wrangel and Herald Islands are Federal property. The Reserve waters situated within the territorial waters of Russia are also under the authority of the Federal Government. The protective zone of the Reserve is situated in international waters, but within the two-hundred mile economic zone of Russia. The Reserve's status and regime are controlled by the Administration of the Chukot Autonomous Area.

Russian Federation	Chukot AO, 686710
Moscow	Anadyr, Bering str., 20
Krasnopresnenskaya emb.	Administration of the
House of the Government	Area
Prime Minister	Head of Administration

B) Legal status

State Nature Reserve

All activities of the Reserve, including the protection of lands and waters, are based on the Law of Russian Federation "On Specially Protected Areas" #33 dated March 14, 1995 (Appendix C1). The "Provision on State Nature Reserve "Wrangel Island" which was approved June 30, 1997 by the Deputy of the Goskomprerody of Russia, also applies to the Reserve (Appendix E1). The basis for the maintenance of a special protection regime is provided by the "Provision on Marine Protective Zone of the State Nature Reserve "Wrangel Island" #91 which was approved by the Governor of Chukot Autonomous Area and dated May 25, 1999 (Appendix E2). Aside from these provisions, activities aimed at maintenance of the conservation regime are regulated by the "Provision on Recreational Zone of "Wrangel Island" Reserve" (Appendix E3) and by "Guidelines for Behavior on the Territory of State Reserve "Wrangel Island" (Appendix E4), developed by the Reserve and approved by its Administration.

C) Conservation and protection measures and their

The Wrangel and Herald Islands are territories that are very difficult to access and are virtually without any permanent population base, other than the people working for the Reserve. The protection and conservation of the Islands and adjacent water area is carried out as

implementation

follows:

a) control after movement of water and air masses in the area around the site with the help of dispatching service of the airport Shmidt and the Headquarters for marine operations in Pevek;

b) constant control of the meteorological station and frontier post located on the Island;

c) regulation of admission and movements of visitors;

d) constant monitoring of conditions and circumstance in the vicinity of birds and animals during critical periods (snow goose colony, walrus rookeries, etc.).

D) Institution charged with the authority of management

Ministry of Natural Resources (MNR) of Russian Federation

Address: Moscow, 123995, Bolshaya Gruzinskaya st., 4/6, D-242, GSP-5.

Major administration functions are assigned to Vice-Head of the Department of environmental protection and ecological safety of MNR of Russia Mr. Stepanitsky V.B.

Phone: ++7 095 125 5688, fax: ++7 095 125 6133.

E) Level at which management is carried out

Management of the site is carried out by the State Nature Reserve "Wrangel Island":

Chukot ? ? ,
settlement Mys Shmidta,
Naberezhnaya str. 27,
Phone: (42739)126;
Director – Bove Leonid Leonidovich.

In 1997, an Agreement on the partial delegation of authority and interaction in the area of the management of specially protected territories (Appendix D) was signed between the State Committee for Environmental Protection, RF (Goskomecology) and the Administration of the Chukot Autonomous Area. According to this Agreement, the Administration of the Chukot Autonomous Area implements partial, but specific control over the activities of the Reserve. In particular, they approve the appointment of Directors and also consider and approve provisions in the Reserve. The Administration of the Chukot Autonomous Area makes decisions regarding protective zone of the Reserve.

F) Approved plans related to the object

Management of the reserve is carried out according to "Regulations of state nature reserve "Wrangel Island", confirmed by Vice-Chairman of State Committee of RF on Environmental protection on 30.06.1997

G) Sources and volumes of financing

The Reserve depends on financing from the State Committee of the Russian Federation for Environmental Protection. Total funds for 1999 amounted to 992,510 rubles, including 848,880 for payment of salaries and taxes. Aside from that, quite frequently some money for the Reserve is allocated by the State Environmental Fund, which, in 1999, amounted to 300,000 rubles. In addition to these funds, the Reserve collects visitation fees from tourists (around $30 US per person per day) and also collects fees for film, video and photo shooting privileges (about $300 US per group per day). Proceeds collected as fees are used at the

discretion of the Reserve Administration. There is no stability in forecasting these earnings as they can vary from a low of $2-3,000 US per year and up to $15-20,000 US per year. These are partially made through "in kind" support (transportation means, field equipment, computers, etc.)

Some additional means sometimes are available as grants intended for certain specific tasks. In this way, during the 1998-1999 period, the Reserve acquired $10,000 US for the elaboration of a biological atlas of the Islands and in 1999 the Reserve was awarded a $5,000 US grant by the US Fish and Game Service that was intended for logistical strengthening of the Reserve, etc.

H) Qualifications and training in nature conservation

Personnel at the Reserve includes 8 persons with higher education (including the Director) and 1 correspondence student in the last year of his studies. Two employees are candidates for the Ph.D., Science (Deputy Directory for Science and the Head of the Environmental Education department) and two employees are correspondence postgraduate students. The nature conservation department retains several very experienced people who have been working on the Island for the past 15-20 years and possess excellent knowledge of the Reserve. They are very well adjusted to working in harsh Arctic conditions and have gained great knowledge of the wilderness through continuous participation in scientific activities.

I) Visitor conditions and statistics

The logistical base of the Reserve intended for visitor services is quite weak. A few empty buildings in Ushkovskoe can be used as dormitories for 12-20 people, but have absolutely no conveniences. There are also about 19 huts and construction modules that could host 2 to 10 people, including accompanying personnel. There are no restaurants, cafes, canteens or general stores on the Islands. Catering is discussed with each group individually. The museum and visitor center is presently being organized in Mys Shmidta, where the Reserve administrative offices are situated. There are no designated tour guides, but field tours are given by qualified personnel in the scientific department.

There are very few visitors to the Islands at the moment. The number of scientific expeditions has also decreased compared to the beginning of the 1990s (due to increased transportation costs and the deterioration of communication between the Islands). Usually, no more than 1 or 2 scientific groups visit the area every year. The intensity of visitation by video and film shooting groups is similar. Only one tourist group consisting of 6 people visited the Island during the last 3 years, though over the previous 5 years the Reserve received 9 "terrestrial groups" (2 to 15 people) and 8 cruise vessels (40 to 80 people each).

J) Management plan

Presently there is no management plan for the Reserve, but preparatory work aimed at elaboration of such a plan is underway. Team members are being selected and funds required for development are being collected. The latter will take up around 6 months and, under favorable conditions, could be elaborated and adopted in 2001. Management of the reserve is carried out according to "Regulations of state nature reserve "Wrangel Island", confirmed by Vice-Chairman of State Committee of RF on Environmental protection on 30.06.1997.

K) Personnel

At the moment the staff of the Reserve accounts for 27 people, including 5 administrative workers, 6 employees in the conservation department, 6 employees in the scientific department, 2 people employed in environmental education and 8 technical and support personnel.

5. Factors Affecting the Property

A) Economic development

Presently, there is know economic activity taking place in vicinity of the Reserve or on it's territory (other than the activity of the Reserve itself). Possible beginning of exploratory drilling and development of shelf oilfields exists in the prospect, however, the adverse impact of the latter activity is prevented by means of establishment of fairly vast protective zone in 1999, the regime of which does not allow for such an activity.

B) Environment

Absence of economic activity and considerable remoteness form industrial centers ensure minimum contamination of the water and atmosphere and absence of noticeable impact on the condition of natural systems of the Islands.

The Islands, as well as the rest of the Arctic area, are subject fluctuations of snow precipitation from one century to another, however, not leading to any global restructuring of landscapes. Climatic trends could cause expansion of hypoarctic complexes (bush tundra and swamps) in case of increase of humidity and temperatures, or expansion of the areas occupied by xerophilous and mesoxerophitic tundrasteppe, steppe and meadow-steppe communities in case if the climate grows more continental. However, existing diversity of ecotopes preconditioned by the Island terrain shape is so great, that in the nearest future there is no threat of extinction for any of the complexes described above. Global warming could seriously impact the condition of the surrounding waters, primarily, the presence of ice. Over the last decade "mollification" of ice conditions was vividly manifested, as the front edge of perennial ice in the summer was located much further north than usual, while freezing occurred later in the year. Consequences of the latter were as follows: a more regular formation of coastal rookeries by walrus, coastal concentration of polar bears, increasing abundance of whales in the adjacent waters, as well the increase of presence of some pacific marine bird species, such as puffin (Lunda cirrhata), (Fratercula corniculata), etc. However, so far it is not clear whether the latter represents an overall trend or one of the phases of a cycle.

C) Natural calamities and preparedness

The area of the site is not subject to seismicity, fire hazard or flooding. Since the time the Wrangel Island has been populated no natural calamity, causing any serious consequences has been recorded.

D) Visitors/ Tourists

Small number of visitors combined with stringent regulation of the areas and time frames of visitation allows to suppose that visitation of the Islands presently has no adverse impact on natural systems. Only scientific and film crews (15-20 people) reside on the island during their visits. Overwhelming majority of tourists arrives on cruise boats (up to 200 people per year) and is familiarized with the Island by means of short

tours of the coast and waters. The number of visitors might grow in the near future, particularly the share of tourist, arriving by cruise boats.

E) Number of people on the site and in buffer zone

At present permanent residents of the Islands are represented by only 4 families residing in Ushakovskoe. Moreover, meteorological station employees (12 people), the frontier post personnel (6 people) and rotating personnel of the Reserve (10 people) also live on the Island.

F) Other

Favorable fodder and weather conditions (absence of major winter warming periods resulting in icy grounds) combined with absence of predators have lead to considerable increase in the numbers of introduced hoofed animals, such reindeer and as musk ox. There are concerns that future increase of their numbers might lead to irreversible changes in vegetation cover of the Island, as well as to significant harm to bird population, primarily to nesting geese colonies. In relation to the above in all the years of functioning of the Reserve measure on regulation of the numbers of reindeer population (shooting, slaughter) have been taken, and these measures are going to be continued and improved further. In the nearest future a similar problem will be relevant to musk ox, whose numbers are growing proportionally to geometric progression. Plans for distributing the Wrangel Island musk ox to the Chukchi Peninsular and east of Yakutia are being developed.

6. Monitoring

Monitoring of the site conditions is carried out in the framework of "Nature Chronicles" and annual execution of this program is the main assignment of scientific department of the Reserve. The list of program items (indicators used for evaluation of the condition of natural systems) is given in Appendix F. In relation to financial difficulties incurred over the last years the program is carried out not to it's full size. The results of monitoring implemented in the course of "Nature Chronicles" program are formalized as annuals reports (books), copies of which are retained by the Reserve, State Committee for Environmental Protection of Chukot Autonomous Area and by Department for Conservation of the State Environmental Committee of the Russian Federation. The data contained in the latest report (volume "Nature Chronicles" for 1999) show that the site and its natural systems are mostly stable. Deviations from parameters recorded over the previous years are related to natural fluctuations in the natural systems. Progressive growth of populations of introduced hoofed animals is noted and requires taking certain measures in the nearest future.

7. Documentation

?) Maps and plans (Annex A)

1. «Wrangel Island» State Nature Reserve location.
2. «Wrangel Island» State Nature reserve Zones.
3. Geography and infrastructure of Wrangel Island.
4. Landscape units of Herald Island.
5. Most important flora and vegetation areas of Wrangel Island.

6. Wrangel and Herald islands birds important habitats.
7. Wrangel and Gerald islands mammals important habitats.

B) Lists of plant and animal species (Annex C)

1. List of vascular plant species and subspecies of Wrangel and Herald Islands.
2. List of insect species of Wrangel and Herald Islands.
3. List of bird species of Wrangel and Herald Islands.
4. List of mammal species of Wrangel and Herald Islands
5. Endemic plant species and subspecies of Wrangel Island.
6. Endemic animal species and subspecies of Wrangel Island.

C) Copies of management plans, regulation documents, etc. (Annex B)

1. Abstract from the Federal Law “On Specially Protected Nature Areas”;
2. Decree of the Soviet of Ministers of RSFSR ? 189 dated March 23, 1975 “On organization of State Nature Reserve “Wrangel Island” of Glavokhota of RSFSR in Magadan Region”;
3. Order of the Government of the Russian Federation N1623-r dated November 15, 1997;
4. Resolution of the Governor of the Chukotka Autonomous Region N 91 dated May 24, 1999 “On Seaside Conservation Area of State Nature Reserve “Wrangel Island”;
5. Agreement between the State Committee of the Russian Federation on Environmental Protection and the Administration of the Chukotka Autonomous Region on partial delegation of authorities and interaction in the field of management of specially protected areas;
6. Provisions on State Nature Reserve “Wrangel Island”;
7. Provisions on Seaside Conservation Area of State Nature Reserve “Wrangel Island”.
8. Rules of behaviour at the State Nature Reserve "Wrangel Island"

D) Photos and slides (Annex D)

1. Coastal landscape of Wrangel Island (Photo by N.Ovsianikov)
2. Coastal landscape of Wrangel Island (Photo by A. Butorin)
3. Landscape of Wrangel Island (Photo by A. Butorin)
4. Mammoth tusk in the valley of Gusinaya river (Photo by A. Butorin)
5. Landscape of Wrangel Island (Photo by N.Ovsianikov)
6. Rookeries on the western coast of Wrangel Island (Photo by A. Butorin)
7. Snow poppy (Photo by N.Ovsianikov)
8. Pulsatilla multifida (Photo by N.Ovsianikov)
9. Snow goose (Photo by N.Ovsianikov)
10. Brent goose on the nest (Photo by N.Ovsianikov)
12. Knot (Calidris canutus) (Photo by N.Ovsianikov)
13. Eider Duck (Photo by A. Butorin)
14. Snowy owl nestlings (Photo by N.Ovsianikov)
15. Walrus (Photo by N.Ovsianikov)
16. Lemming (Photo by N.Ovsianikov)
17-18. Arctic fox (Photo by N.Ovsianikov)
19-20. Polar bear family (Photo by N.Ovsianikov)
21. Reindeer (Photo by N.Ovsianikov)

E) Bibliography

Bibliography of the publications about the site enrolls several hundred items, including several dozens of books. Main information about the Islands Wrangel and Herald is presented in the Annex E.

F) Address where inventory, records and archives are held	"Wrangel Island" State Nature Reserve: Naberezhnaya str., 27, settlement Mys Shmidta, Chukot AA, Russia Ministry of Natural Resources of Russian Federation: Bolshaya Gruzinskaya st., 4/6, 123995, Moscow, Russia D-242, GSP-5.

8. Signature on behalf of the State Party

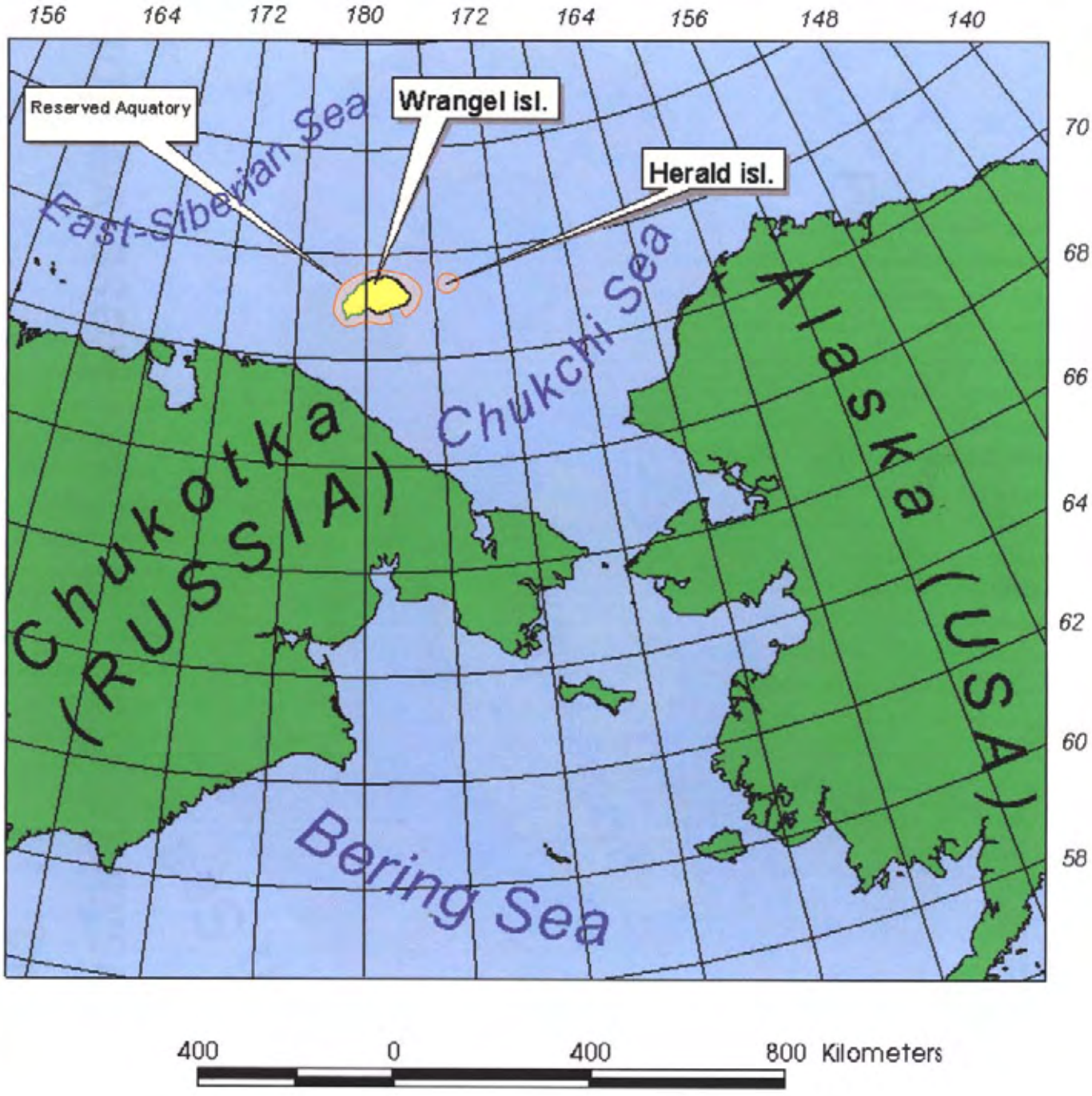
Vice Minister of Natural Resources
of Russian Federation

ANNEX A
MAPS AND PLANS

1. «Wrangel Island» State Nature Reserve location.
2. «Wrangel Island» State Nature reserve Zones.
3. Geography and infrastructure of Wrangel Island.
4. Landscape units of Herald Island.
5. Most important flora and vegetation areas of Wrangel Island.
6. Wrangel and Herald islands birds important habitats.
7. Wrangel and Gerald islands mammals important habitats.

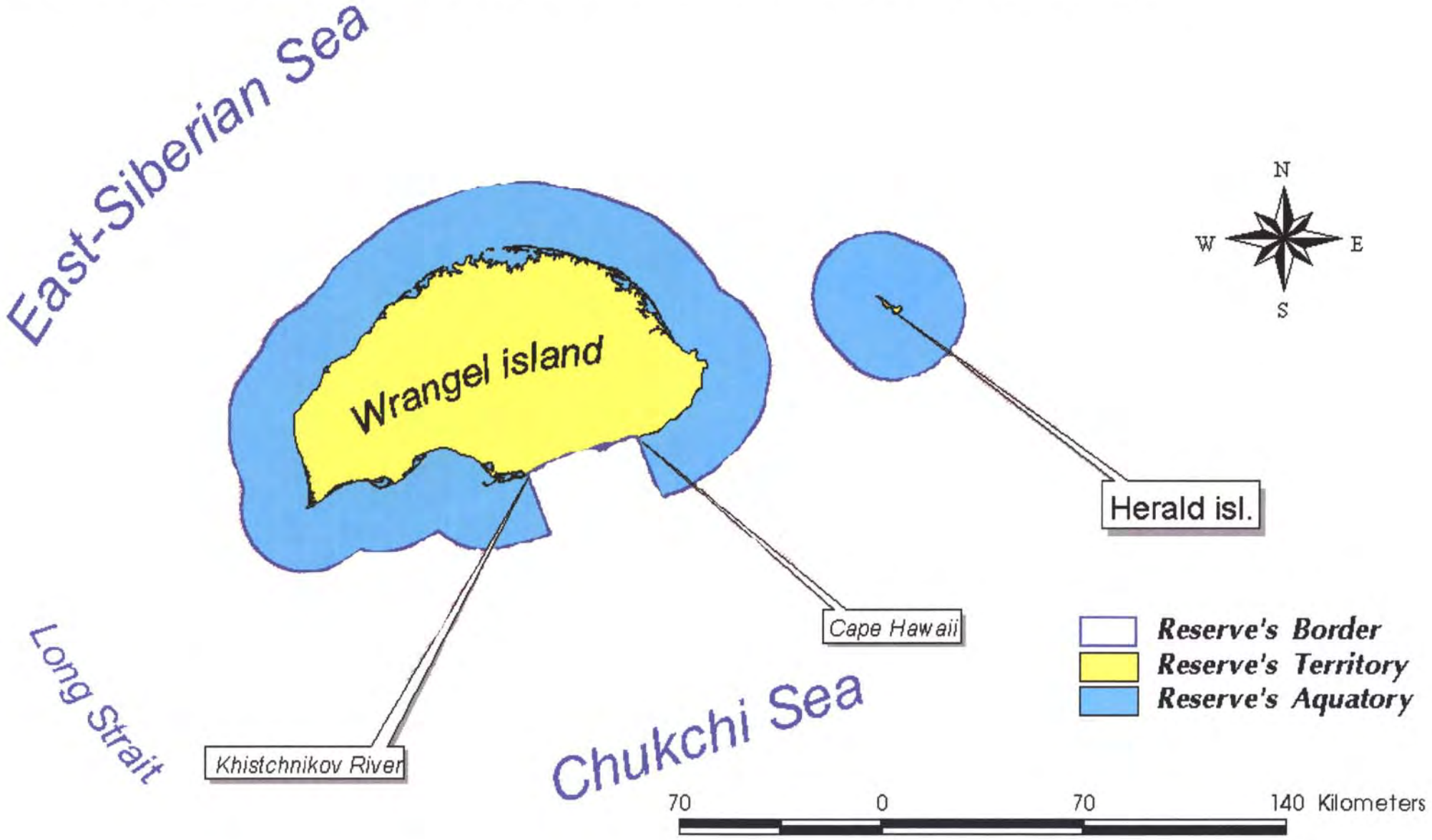
Appendix A1.

"Wrangel island" State Nature Reserve location

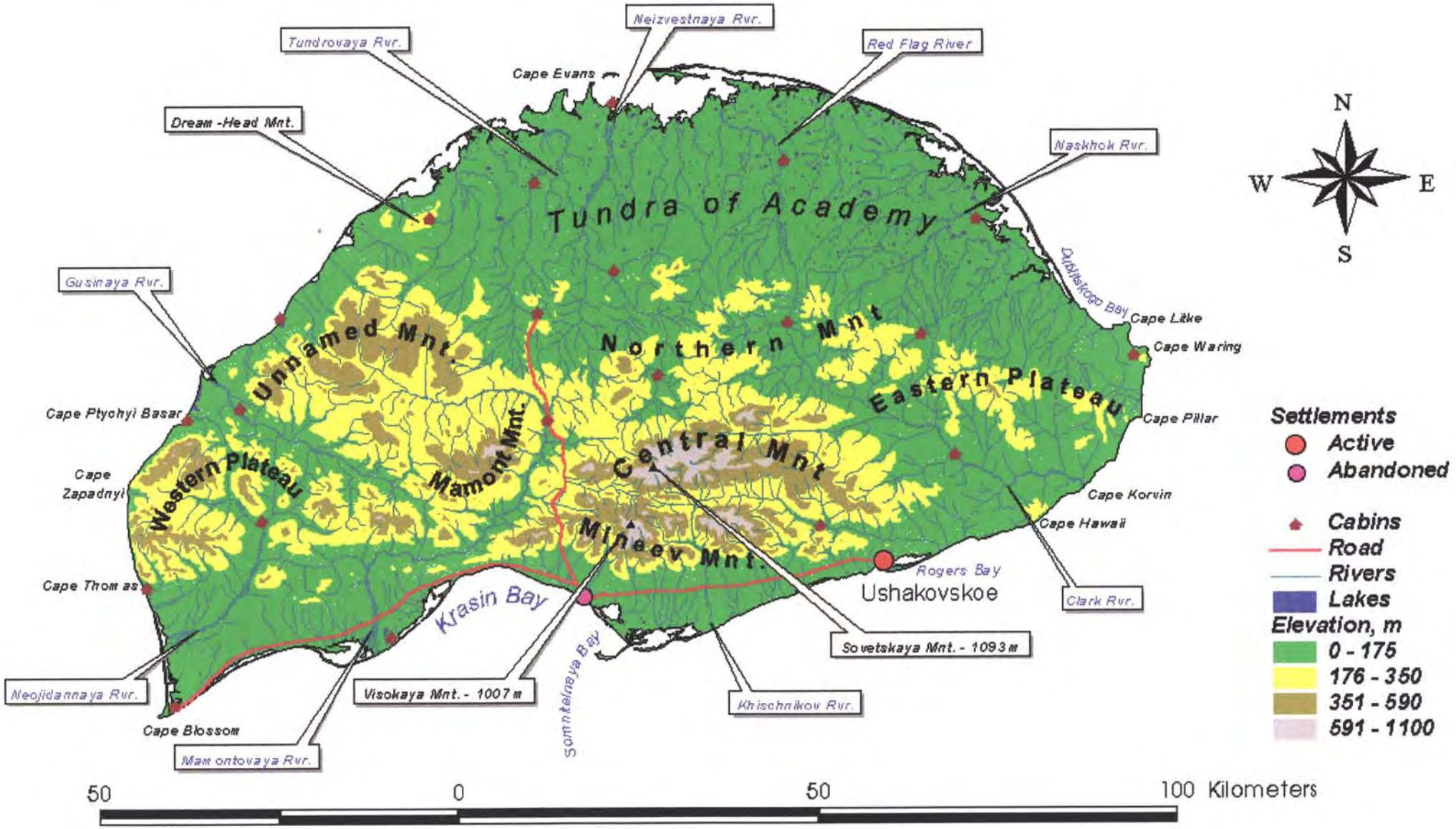


Appendix A2.

"Wrangel island" State Nature Reserve Zones

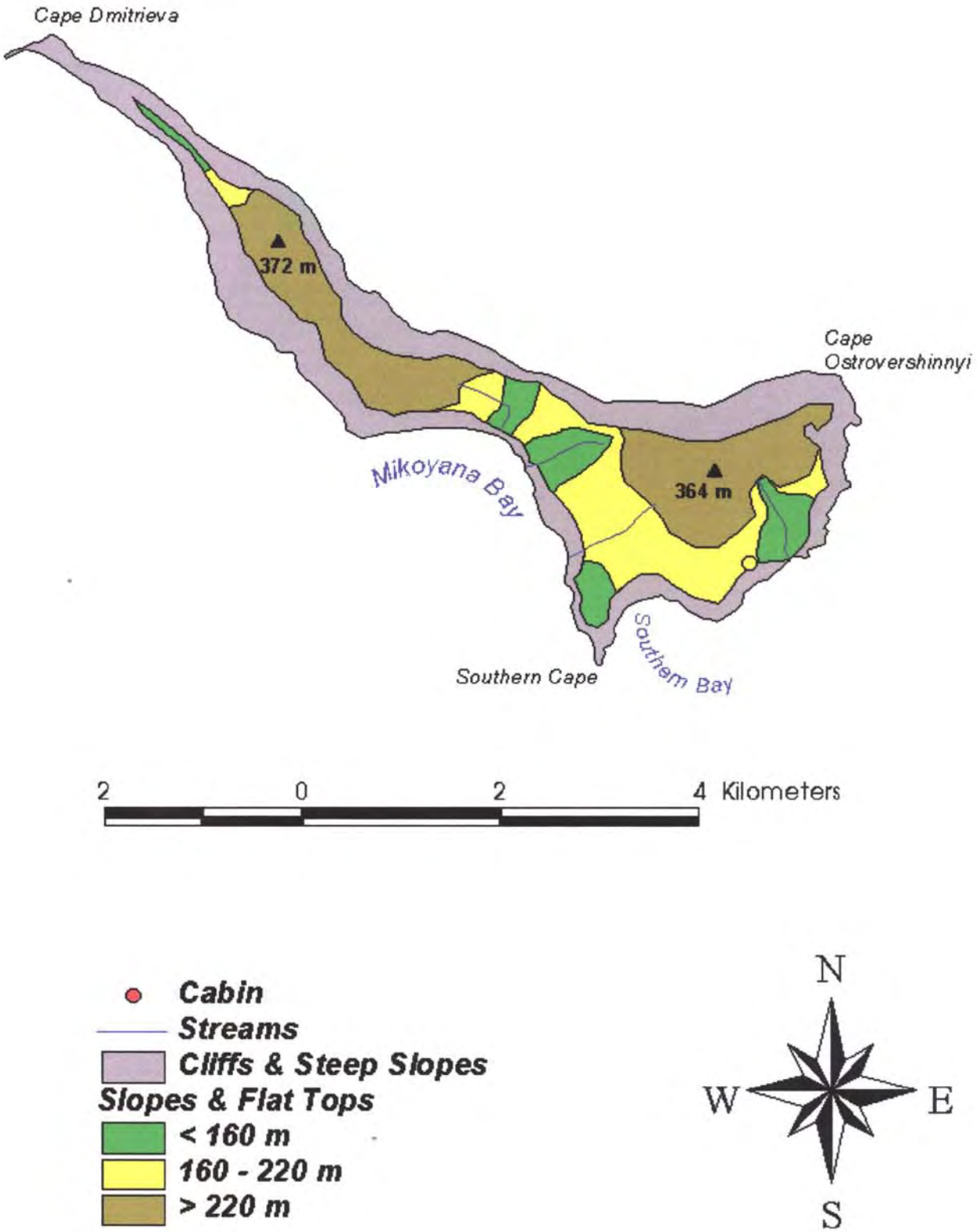


Appendix A3.
Wrangel Island Geography & Infrastructure



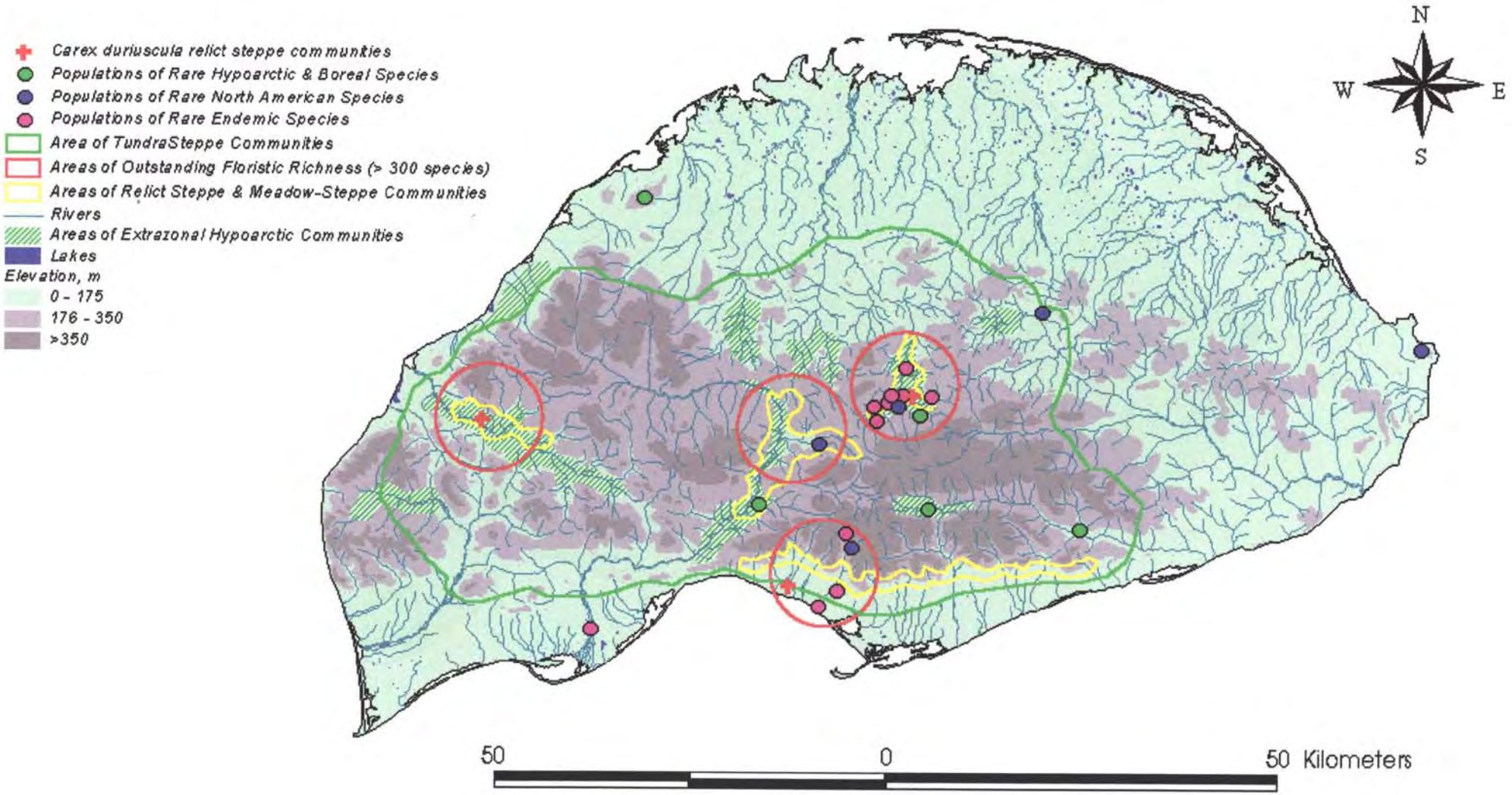
Appendix A4.

Herald Island Landscape Units



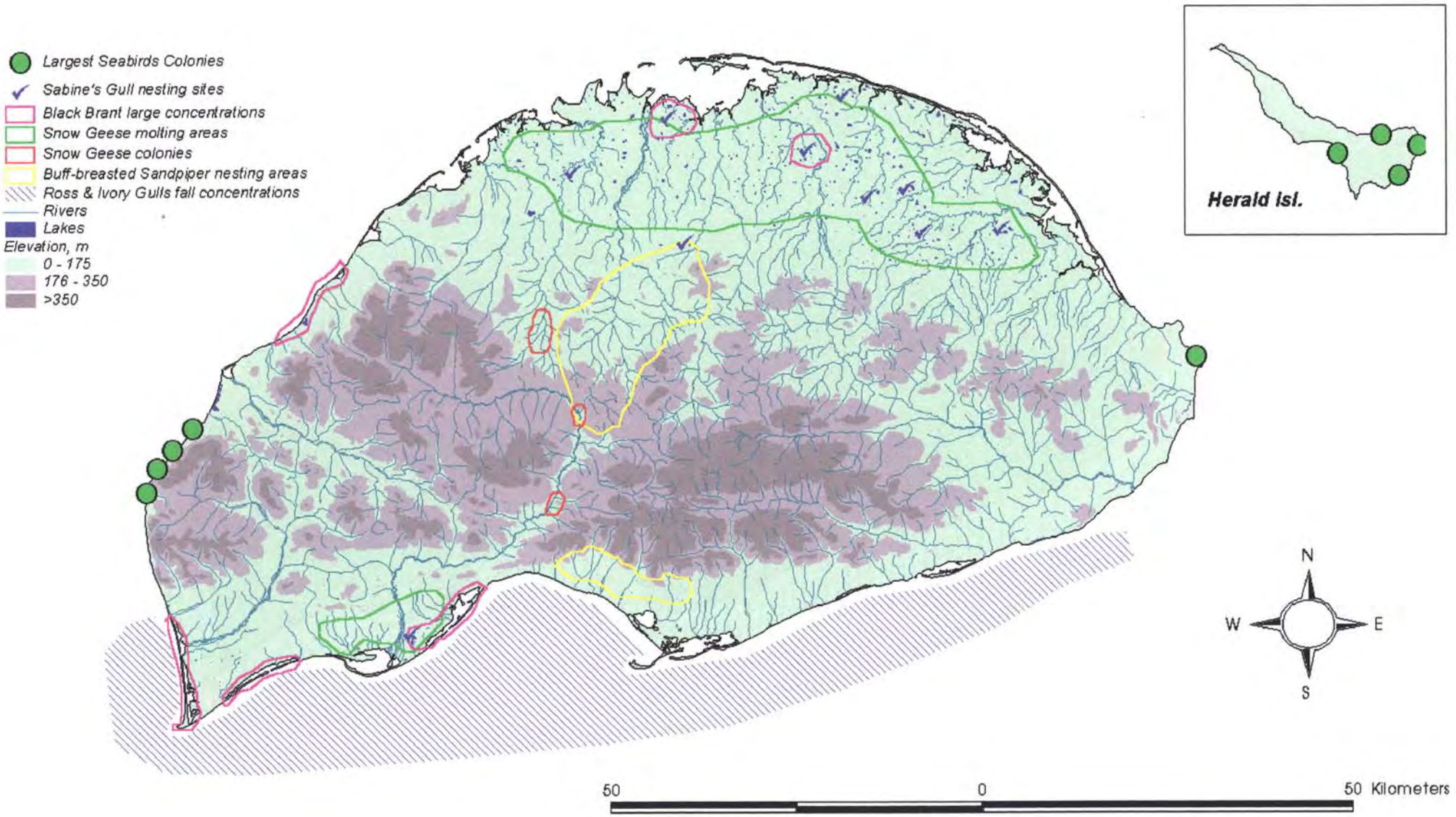
Appendix A5.

Wrangel isl. Important Flora & Vegetation Areas



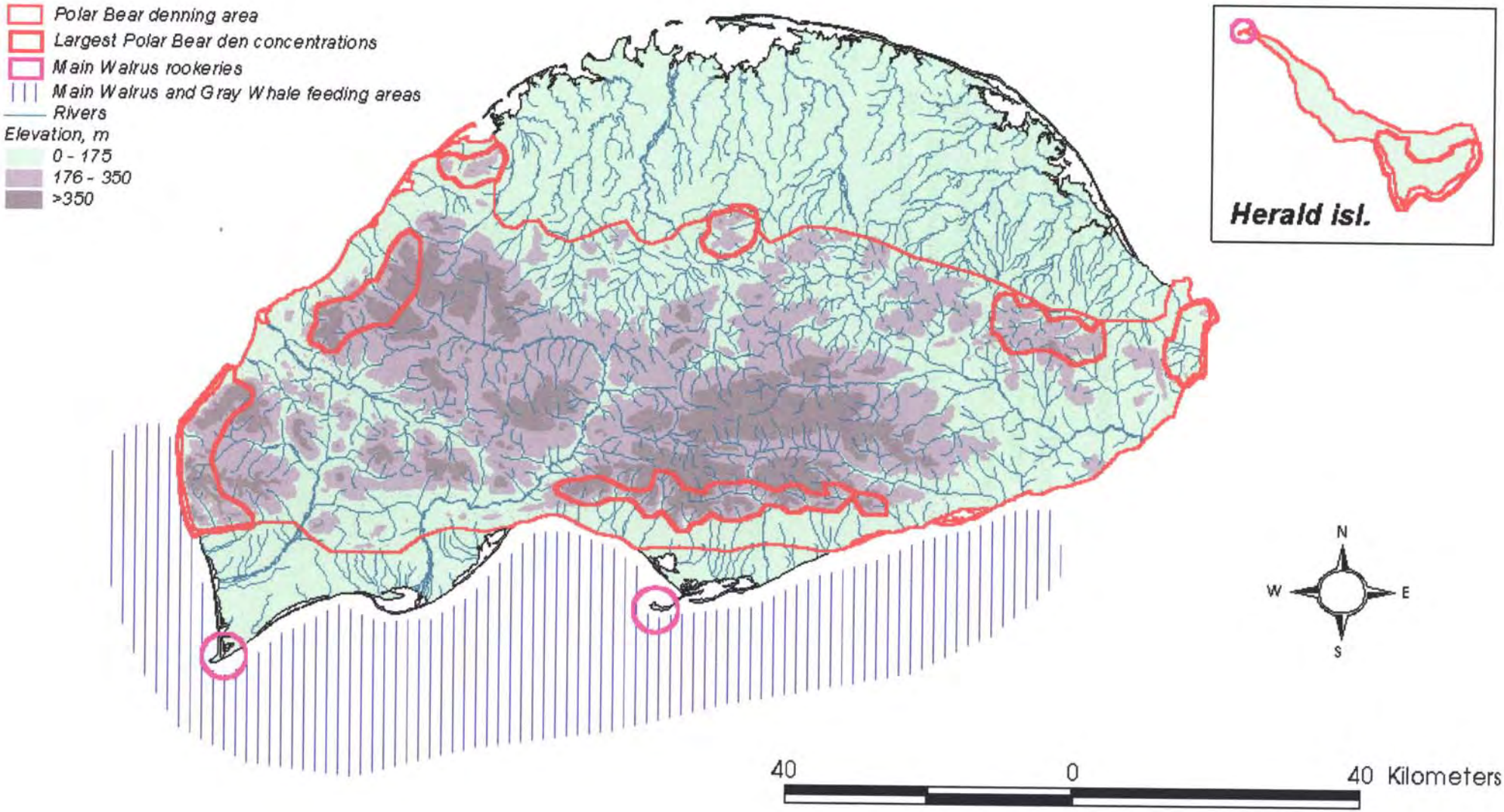
Appendix A6.

Wrangel & Herald islands Birds Important Areas



Appendix A7.

Wrangel & Herald islands Mammals Important Areas



ANNEX B
REGULATION DOCUMENTS

1. Abstract from the Federal Law “On Specially Protected Nature Areas”;
2. Decree of the Soviet of Ministers of RSFSR ? 189 dated March 23, 1975 “On organization of State Nature Reserve “Wrangel Island” of Glavokhota of RSFSR in Magadan Region”;
3. Order of the Government of the Russian Federation N1623-r dated November 15, 1997;
4. Resolution of the Governor of the Chukotka Autonomous Region N 91 dated May 24, 1999 “On Seaside Conservation Area of State Nature Reserve “Wrangel Island”;
5. Provisions on State Nature Reserve “Wrangel Island”;
6. Provisions on Seaside Conservation Area of State Nature Reserve “Wrangel Island”.
7. Rules of behaviour at the State Nature Reserve "Wrangel Island"

ON SPECIALLY PROTECTED NATURE AREAS

The Federal Law of the Russian Federation dated March 14, 1995

Specially protected nature areas are defined as terrestrial and aquatic areas including atmospheric spaces above them, hosting nature complexes and objects presenting outstanding value for the environmental protection, science, culture, as well as for recreation and human health rehabilitation and thus are entirely or partially exempt for economic activity by virtue of the decision made by governmental bodies and are subject to regimen of special protection.

Specially protected nature areas are considered to be objects of national heritage.

1. State Nature Reserves (Wrangel Island State Nature Reserve):

Article 6.

1. Specially protected nature complexes and objects (nature sites, aquatories, subsurface, flora and fauna) possessing an outstanding environmental and educational, scientific and nature protection values being samples of nature environments, typical or rare landscapes, sites of genetic resource conservation for wildlife flora and fauna are to be completely withdrawn from economic activities within the areas of the State National Reserves.

The State Nature Reserves are institutions of nature protection, scientific research and environmental education, aimed at preservation and research of the nature mechanism of the processes and phenomena, genetic resource of the flora and fauna, individual wildlife species and plant and animal communities, as well as typical and unique environmental systems.

Article 9.

1. An activity, contradictory to the objectives of the State Nature Reserve, the regime of special protection set forth by the provision on the above mentioned Reserve is prohibited within it's grounds.

Introduction of any alive species into the grounds of the State Nature Reserve aimed at the acclimatization of the aforementioned species is prohibited.

2. The grounds of the State Nature Reserves allow for the following undertakings and activities intended to:

a) reserve the nature condition of the wildlife complexes, including rehabilitation and prevention of changes to occur in the nature complexes and their components resulting from human impacts;
b) maintain the conditions securing sanitary and fire safety;
c) prevent the conditions capable of causing nature disasters dangerous for human life and settlements;
d) implement environmental monitoring;
e) carry out research and investigation tasks;
f) promote environmental education and awareness;
g) implement overseeing and controlling functions.

Article 10. State Nature Biosphere Reserves

1. The State Nature Reserves, which are included in an international system of biosphere reserves, realising global ecological monitoring have status of the State Nature Biosphere Reserves.

2. Biosphere polygon territories, including those with differentiated condition of the special guards and functioning can be joined to territories of state nature biosphere reserves with the purposes of realisation of scientific researches, ecological monitoring, and also for approbation and introduction of rational nature management methods, not destroying environment and not exhausting biological resources.

Article 11.

2. State Nature Reserves use the following financial assets at their discretion and according to the existing procedure:

- income of scientific and nature protection activities, advertising and publishing, as well as other activities non-contradictory to the purposes of the State Nature Reserves;
- payments in compensation of damage caused to nature complexes and objects, located within the grounds of the State Nature Reserves;
- revenue from the sale of legitimately expropriated poaching implements and the products resulting from illegal use if the nature resources
- free donations and charity contributions.

DECREE
of March, 23, 1975

On organization of the "Wrangel Island"
State Nature Reserve in Magadan Region

Soviet of Ministers of RSFSR resolves:

1. To accept the proposal of Magadansky Regional executive committee conformed with the State Planning Committee of the USSR, of organization of the "Wrangel Island" State Nature Reserve on Wrangel and Herald Islands, under the authority of the Head Hunting Resources Department of RSFSR in Magadan Region.

   To withdraw land plots of the total area of 795 650 ha from "Pioneer" state farm and to turn it over to the "Wrangel Island" State Nature Reserve (795 650 ha) and to the Polar Station of Pevek Department of Meteorology (10 ha).

2. For Ministry of Agriculture of RSFSR to provide the turn over of buildings, constructions and reindeer herd belonging to the state farm land, to the State Nature Reserve, in established order.

Vice-Head of the Soviet
of Ministers of RSFSR V. Vorotnikov

Business-manager of the Soviet
of Ministers of RSFSR I.S. Smirnov

State Environmental Protection Committee

THE GOVERNMENT OF THE RUSSIAN FEDERATION

ORDER # 1623-r
of 15 November 1997
Moscow

Accept the proposal of the Russian Federation State Committee for Environmental Protection and the Administration of the Chukotka Autonomous Region agreed with the Federal Border Guard Service and the Ministry of Agriculture of the Russian Federation, concerning transfer of the 12-mile zone of internal waters and the territorial sea around the islands of Wrangel and Herald (with an exception of the part of the above mentioned area adjoining the southern coast of Wrangel Island from the mouth of River Khishchnikee to Cape Hawaii) to State Nature Reserve “The Island of Wrangel”.

V. Chernomyrdin
Prime Minister
The Government of the Russian Federation

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THE GOVERNOR
OF THE CHUKOTKA AUTONOMOUS REGION

RESOLUTION #91
of 24 May 1999

Anadyr

Re: Seaside Conservation Area of State Nature Reserve “The Island of Wrangel”.

In compliance with Section 4 of Article 8 of Federal Law “On Specially Protected Natural Areas” and for the purposes of ensuring conservation and protection of unique natural (land and marine) complexes of Nature Reserve “The Island of Wrangel” from unfavorable human-caused impacts, as well as to maintain normal functioning of coastal marine and island ecosystems, the Governor of the Chukotka Autonomous Region

ORDERS to:

1. establish a 24-nautical mile seaside conservation area around the 12-mile nature reserve water space surrounding the Islands of Wrangel and Herald;

2. approve the enclosed Provisions on Seaside Conservation Area of State Nature Reserve “The Island of Wrangel”;

3. submit to the Government of the Russian Federation a request concerning expansion of the water space of Nature Reserve “The Island of Wrangel” by additional 12 miles;

4. assign preparation of the rationale for expansion of the nature reserve water space to the Department of Nature Protection Areas and Wildlife (N. Zheleznov);

5. assign supervision over execution of this Resolution to the Governor;

6. publish this Resolution in the “Krayny Sever” (Far North) newspaper.

A. Nazarov

APPROVED:
A. Amirkhanov
Vice Chairman
State Committee for Environmental protection of the Russian Federation

30 June 1997

Provisions on State Nature Reserve "The Island of Wrangel".

GENERAL

1. State Nature Reserve "The Island of Wrangel" (hereinafter referred to as the Reserve) is an environmental protection, scientific and research and educational establishment of the federal level, having as its goal conservation and study of the natural course of natural processes and phenomena, genetic pool of local flora and fauna, individual species and communities of plants and animals, typical and unique ecosystems.

2. The Reserve is a non-profit organization and is funded from the federal budget, having an independent balance, accounts (including hard currency accounts) in banks of the Russian Federation, as well as a Seal with the National Emblem of the Russian Federation and its own title.

3. The Reserve is located in the Schmidt District of the Chukotka Autonomous Region (Appendix 1).

4. The land and subsoil assets, waters, flora and fauna located within the limits of the Reserve are given to the Reserve based on the rights envisaged in appropriate federal laws. Alienation of these or any revocation of the right of ownership on them is forbidden.

5. The property of the Reserve is the property of the State.

6. All buildings, facilities and historic and cultural and other real estate items are secured to the Reserve based on the right of operational management.

7. Natural resources and real estate property of the Reserve are *res extra commercium* (they cannot be alienated or transferred from one entity to another in any other way).

FUNCTIONS OF THE STATE NATURE RESERVE

8. The Reserve shall have the following functions:
    a) protection of natural areas for the purpose of conservation of biological diversity and maintaining protected natural complexes and sites in their natural state;
    b) organization of scientific research, including keeping the Nature Chronicles;
    c) environmental monitoring;
    d) ecological education;
    e) participation in the state environmental assessment of projects and plans of location of industrial and other facilities;

f) support in training scientific personnel and experts in the field of environmental protection.

RESERVE ESTABLISHING PROCEDURE

9. The Reserve was established upon Resolution of the Council of Ministers of the Russian Federation #189 on 23 March 1976 (Appendix 2) confirmed by Order #155 of 20 April 1976 of the State Hunting Committee of the Russian Federation (Appendix 3) based on Decision #385 of 7 August 1975 (Appendix 4) of the Magadan Regional Executive Committee.

The borders of the Reserve are established in compliance with Decision #504 of 3 November 1975 (Appendix 5) of the Magadan Regional executive Committee. The total area of the Reserve is 795,650ha.

10. Upon Decision #542 of the Magadan Regional Executive Committee (Appendix 5), on 26 December 1983, in the 5-km wide water area adjoining the Reserve and surrounding the islands of Wrangel and Herald a protection zone with limited nature management regime was established (Appendix 7).

11. The Decision about establishment of the protection zone of the Reserve and the Provision about it are enclosed.

REGIME OF THE RESERVE

12. Any kind of activity conflicting with the functions of the Reserve and the special protection regime of the Reserve area are forbidden, including:

activities changing the hydrological regime of the lands;

exploratory and mining activities, activities disturbing the soil cover, mineral outcrops and rock outcrops;

collection of herbs and technical raw materials, as well as other types of nature management except in cases specified in this Provision;

cattle grazing, harvesting of wildings, berries, mushrooms, seeds, flowers, and other types of the flora management except in cases specified in this provision;

construction and location of industrial and agricultural enterprises and their individual facilities, construction of buildings and facilities, roads and viaducts, power lines and other communications except those necessary to support operation of the Reserve. In case of the facilities specified in the General State Development Plan, construction permits shall be issued in compliance with Article 61 of the Law of the Russian Federation “On Local Government in the Russian Federation”;

industrial, sports and amateur hunting activities and other types of fauna management, except in cases envisaged in this Provision;

introduction of living beings for acclimatization purposes;

application of mineral fertilizers and chemical vegetation protection agents;

transit of cattle;

presence and passage of impostors or vehicles except along public roads and waterways;

collection of items for zoological, botanical and mineral collections except those corresponding to the topics and plans of scientific research in the Reserve;

flight of planes and helicopters lower than 2,000 meters over lands and waters of the Reserve without consent of the Reserve Administration of the Russian Federation State Environmental Protection Committee, as well as flight of planes on supersonic speeds;

other activities disturbing natural development of natural processes, threatening the well-being of natural complexes and sites, as well as activities not related to the functions of the Reserve.

13. In the Reserve, allowed are measures and activities aimed at:
    a) conserving in their natural state natural complexes, restoring and preventing any alterations in natural complexes and their components due to human-caused impact;
    b) maintaining conditions to ensure sanitary and safety conditions for people, animals, natural complexes and sites;
    c) preventing hazardous natural phenomena (avalanches, dilapidations, mudflow and etc.), threatening people's lives and settlements;
    d) carrying on scientific research including environmental monitoring;
    e) carrying on ecological education activities;
    f) fulfilling control functions.

14. In specially allocated areas of partial economic development, activities are allowed that are aimed at ensuring operation of the Reserve and supporting the livelihood of people living in its territory; and carried on in compliance with this Provision:

    collection of floating timber of anthropogenic origin for construction purposes and heating in the Central Hall and field stations of the Reserve;

    collection of wild leek, oxalis and mushrooms for personal needs (with no right of sale) by all residents of the village of Ushakovskoye within the recreation area of the village and within the limits specified in Appendix 8, as well as in areas of field stations if they participate in environmental protection and scientific and research activities;

    non-professional fishing and collection of algae in the Rogers Bay by all residents of the village of Ushakovskoye for personal needs (with no right of sale);

    keeping of dogs by Reserve employees at field stations indoors or on a leash (in these cases an individual permit for each dog shall be issued by the Reserve Administration);

    limited harvesting of walruses, bearded seals and other seals for personal needs by indigenous residents of the village of Ushakovskoye (with no right of sale) based on quotas allocated upon consent of the Chukotka Regional Fishing Inspection, in the protected area of the Reserve along the southern coast from the mouth of river Nasha to the mouth of river Mamontovaya;

    organization and development of training and excursion ecological tourist trails (see Appendix 9);

    annual regulation of the numbers of reindeers in the whole area of the island, the scope of which shall be defined by the Scientific Council of the Reserve and with permission of the Nature Reserve Department of the State Committee for Environmental protection of the Russian Federation;

in the Reserve, any harvesting of animals for scientific purposes and regulation purposes may be permitted only with permission of the Nature Reserve Department of the State Committee for Environmental Protection of the Russian Federation.

15. Presence in the Reserve of people who are not employees of the Reserve, or officials who are not employees of the State Committee for Environmental Protection of the Russian Federation may be allowed on provided they have a special permission from the Russian Federation State Committee for Environmental Protection or the Reserve Administration.

RESERVE MANAGEMENT

16. Management of the Reserve is carried on by the Russian Federation State Environmental Protection Committee. The Reserve has its Director appointed by the Russian Federation State Committee for Environmental Protection. The Director is responsible for all activities of the Reserve.

CONSERVATION OF NATURAL COMPLEXES AND SITES IN THE STATE NATURE RESERVE

17. Protection of natural complexes and sites in the Reserve is carried on by a special state inspection for protection of state nature reserves. The inspection officers are employees of the nature reserve.

18. The Reserve Director and its deputies including the Security Service Head are chief state inspectors for protection of the state nature reserve.

The rights of the state inspectors for protection of the nature reserve may be granted to reserve employees who do not hold positions of state inspectors. The above metioned rights are granted upon the consent of the employee based on a written application, which is then approved by an order of the Director of the Nature Reserve.

RIGHTS OF STATE INSPECTORS FOR PROTECTION OF THE STATE NATURE RESERVE

19. In compliance with the laws of the Russian Federation, reserve employees who are state inspectors for protection of the nature reserve are in position to:

    a) check permits to be in the Reserve of persons actually present in the area, as well as their licenses to keep and bear arms from the Ministry of the Interior;
    b) check papers entitling to carry on activities in the field of nature management and other activities in the protection zone adjoining the Reserve;
    c) detain persons who have violated Russian Federation laws on specially protected natural areas in the Reserve and its protection zone, fill out records of violation and hand the offenders over to law enforcement agencies;
    d) carry on personal search and search of belongings of detained persons, spot and search vehicles, check weapons and other hunting tools and harvested fauna including that during transportation, in storage and reprocessing facilities;

e) resort to physical force as established by Law, as well as special means including handcuffs, rubber truncheons, tear gas, means of forcing vehicles to stop, tracker dogs and firearms;
f) prepare materials to carry persons caught in violating the regime of the Reserve before justice;
g) confiscate from persons who have violated laws of the Russian Federation on specially protected natural areas products and tools of illegal nature management, vehicles, as well as appropriate documents filling out protocols of confiscation as established by Law;
h) have unimpeded access to any facilities in the area of the Reserve and its protection zone to check compliance with laws of the Russian Federation on specially protected natural areas;
i) suspend economic and other activity conflicting with the special protection regime of the Reserve and its protection zone;

20. The Chief State Inspector and his (her) deputies are granted all rights of state inspectors envisaged in this Provision. Besides, the above-mentioned officials are in position to:
    a) prohibit economic and other activities conflicting with the regime of the State Nature Reserve and its protection zone;
    b) impose administrative sanctions for violation of laws of the Russian Federation on specially protected natural areas;
    c) commence an action against physical and legal entities to force them to cover damage to natural complexes and facilities of the Reserve, its protection zone and other areas of the Reserve caused by violation of the established regime;
    d) hand over to law enforcement agencies materials on violations of laws of the Russian Federation on specially protected natural areas.

21. State Inspectors for protection of the state nature reserve also enjoy all the rights of officials of the State Forest Guard Service and other special state agencies of the Russian Federation authorized to work in the field of environmental protection.

22. State Inspectors for protection of the state nature reserve are licensed to bear firearms while on duty. The order of purchasing, storing and applying firearms shall be regulated by the existing legislation.

23. State Inspectors for protection of the state nature reserve have armor vests and other personal protective equipment.

24. State Inspectors for protection of the state nature reserve are subject to compulsory insurance in compliance with the laws of the Russian Federation.

25. Damage to property of state inspectors caused in line of duty will be covered by the Reserve and the Russian Federation State Committee for Environmental Protection. If such is the case, the Reserve Administration has the right to commence a recourse action against the legal entity or individual responsible for the damage caused.

26. If a state inspector is killed in line of duty, his family his paid his allowance for five years starting on the date of his death, and after that a widow’s allowance in compliance with the existing legislation.

SCIENTIFIC AND RESEARCH ACTIVITIES IN THE RESERVE

27. Scientific and research activities in the Reserve are aimed at studying natural complexes and long-term observation of natural processes' dynamics for the purposes of analyzing and forecasting possible environmental fluctuations, developing scientific basis for environmental protection activities, conservation of biological diversity of the biosphere, restoration and efficient management of natural resources.

28. Scientific and research activities in the Reserve are carried on by:
staff employees according to plans of scientific and research activities;
scientific and research institutions and higher education institutions of appropriate profile based on contracts and according to joint programs agreed with the Russian Federation State Committee for Environmental Protection;

29. Organization and direct supervision of scientific and research activities carried on in the Reserve are the responsibility of the Deputy Director for Science appointed by the RF State Committee for environmental Protection and serving as 1st Deputy Director of the Reserve.

30. The Reserve has its Scientific Council. The composition of the Scientific Council is approved by the RF State Environmental Protection Council. Operation of the Scientific Council is regulated by the Provision on Scientific Councils in State Nature Reserves approved by the RF State Environmental Protection Committee.

31. The Reserve establishes and stores scientific funds.

32. The Reserve is entitled to publish scientific papers.

FINANCIAL AND ECONOMIC ACTIVITIES OF THE RESERVE

33. The Reserve may carry on any activities that do not conflict with its goals and established regime.

34. Plans of measures to reach objectives set up for the Reserve, and budget funding are subject to the RF State Environmental Protection Committee's approval.

35. The Reserve may independently command its own funds gained:
from scientific, environmental protection, advertisement and publishing and other activities not conflicting with the goals and functions of the state nature reserve;
on account of compensation of damage caused by legal or physical entities to natural complexes and sites located in the State Nature Reserve;
from sale of appropriately confiscated hunting and fishing tools and products of illegal nature management;
as gratis aid and charity donations.

Administrative forfeitures for ecological offences collected upon resolutions of the State Nature Reserve officials come under independent command of the Reserve.

36. The Reserve is entitled to have its own symbols (flag, pennant, emblem and etc.) approved by the RF State Environmental Protection Committee.

37. Production of display, printed, souvenir and other replicated items and consumer goods using natural and historical and cultural sites located in the Reserve, as well as

its title and symbols may become possible only upon the consent of the Reserve Administration.

38. The Reserve is entitled to tax exceptions set up for state nature reserves in Russian Federation laws and laws of the Chukotka Autonomous Okrug (Region).

WORKING AND PAYMENT CONDITIONS IN THE RESERVE

39. The structure and staff of the Reserve are defined by the Director of the Reserve within the limits of the wages fund and based on the functions and specifics of the Reserve.

40. Forms, system and size of salaries of employees are set up by the Reserve in compliance with the effective terms of payment and based on the salary funds available.

Premiums, bonuses, bounties and other types of additional payment are defined by the Administration of the Reserve in compliance with the existing legislation.

41. Housing stock of the state nature reserve may be included into the office premises fund according to the established procedure.

42. If an expert temporarily moves to the Reserve, the living quarters his family and he occupied in the place of their permanent residence shall be secured to them for the whole term of his contract.

43. Reserve employees are provided with free work clothes, foot-gear and individual protective equipment in compliance with regulations approved by the State Environmental protection Committee of the Russian Federation, as well as with a badge of the established pattern. Besides that, state inspectors are provided with free uniform with insignia and body armor.

44. Reserve employees having private cars, motorcycles, snow scooters, motorboats and boat engines and using these in line of duty may be provided with combustive and lubricating materials and their vehicles may be repaired in the Reserve.

45. Reserve employees are provided with firewood for premises heating at reduced prices set up for people employed at forestry enterprises.

46. Reserve employees are subject to exemptions in regard to restrictions envisaged in Article 20 of the Russian Federation Labor Code and related to employment of relatives by the same company.

CONTROL OVER OPERATION OF THE RESERVE

47. State supervision of organization and operation of the Reserve is the responsibility of government agencies of the Russian Federation specially authorized to work in the field of environmental protection.

D. Kovalyov
Director
State Nature Reserve “The Island of Wrangel”.

Approved by
Resolution of the Governor
of the Chukotka Autonomous Region
#91 of 24 May 1999

PROVISIONS
on Seaside Conservation Area of State Nature Reserve "The Island of Wrangel".

1. General.

These Provisions on Seaside Conservation Area of State Nature Reserve "The Island of Wrangel" have been developed in compliance with Sections 3 through 4 of Article 8 of Federal Law "On Specially Protected Natural Areas".

2. Territory.

The territory (water space) of the Seaside Conservation Area along the borders of the Reserve established by Executive Order of the Russian Federation Government #1623-r of 15 November 1997, includes:

- 24-nautical mile water space around the 12-mile nature reserve water space surrounding the Islands of Wrangel and Herald, as well as the 36-mile zone in the southern sector of the coastal waters of Wrangel Island from the mouth of River Khishchnikee to Cape Hawaii with the width of 12 nautical miles in compliance with Annex 1.

3. Administration and Control.

Management of the territory (water space) of the Seaside Conservation Area shall be carried on by the Administration of the "Island of Wrangel" State Nature Reserve in cooperation with the Administration of the Chukotka Autonomous Region. Control over management of the Seaside Conservation Area shall be assigned to the Governor of the Chukotka Autonomous Region or agencies especially authorized for it by the Governor.

4. Goals and Objectives.

4.1. The Seaside Conservation Area has been established to protect unique natural (land and marine) complexes of Nature Reserve "The Island of Wrangel" from unfavorable human-caused impacts, as well as to maintain normal functioning of coastal marine and island ecosystems and ensure long-term environmental safety;

4.2. The seaside conservation area has the following objectives:

- conservation of key reproduction habitats and feeding grounds of the Chukotka-Alaska population of polar bear;
- conservation of key habitats of sea mammals (pacific walrus, floe rat (Phoca hispida), lakhtak, gray whale) and birds;
- protection of arctic mammals and birds during migration and reproduction periods.

CONFIRMED BY:
Director of the Reserve
A.V. Sukhov

RULES OF BEHAVIOUR AT THE "WRANGEL ISLAND" STATE NATURE RESERVE

Within the reserved area you should remember that any reckless and ill-considered actions can damage the reserved Nature and influence the natural way of its processes. Please treat the reserved land and all its inhabitants as a sacred thing – this is important not only for the Nature, but also for you soul.

Not only malicious intents, but also carelessness and incompetence can bring harm to Nature. To avoid this, you should remember and follow simple rules of behaviour.

1. General rules

The present rules are obligatory for any person having admission or applying for permission of the administration for visiting or working within the area of the "Wrangel Island" State Nature Reserve.

Before you go to the field of the reserve, please read carefully its normative documents – "Regulations of the State Nature Reserves of Russian Federation"; "Regulations of the "Wrangel Island" State Nature Reserve" and other regulations confirmed by the Director of the Reserve or the higher authority. Violation of the Regulations' demands can lead to administrative recovery. The Reserve's administration or guarding inspectors are obliged to give you these documents for acquaintance.

Please remember that the Reserve has been created for conservation of the whole nature complex for the benefit of the present and future generations. Nature has no useless or unimportant objects. Note that any gathering, collection and catching animals within the Reserve without the special permission of its administration is prohibited (including collection of minerals, fossils, eider down, musk ox wool, animal bodies and remnants – tusks, teeth, sceleton parts, etc.; flowers and bouquets gathering, eggs and nests gathering, and also insects catching).

At the Reserve's area you should always have binoculars with you. Many animal species are unable to bear human disturbance and notice you before you can see them. Remember, that you can cause the death of the animal or its progeny. Be very careful with animals. You need binoculars to notice in time what is going on around you.

Please be careful with plants. Walking across the reserved land always notice where you step. Do not damage plants and plant cover of tundra. The Wrangel Island has endemic species and communities which can be found in single places. Your irresponsibility can cause their extinction.

Absence of binoculars and inattentiveness would not free you from responsibility for violation of the Reserve's regime.

2. Special rules

Do not leave any rubbish at the Reserve's area. During your stay at the Reserve's field stations you have to collect and separate rubbish, annihilate it or take it away with you to the village. Rubbish is divided into 4 classes (collected separately): a) cans (tinned iron) – flattened and taken away; b) glass (whole or broken) – collected in boxes without slits and taken away; c) dry rubbish – burnt in a stove or a special barrel; d) food scrups – organic matter can be burnt or collected in a special heap at the field station.

Do not spoil gasoline on the ground at the Reserve's area. Any manipulation with gasoline and grease should be carried out very carefully and only in special places at the field

station. Be especially careful during forced refuelling in tundra – spoiled gasoline kills animals and plants and poisons soil.

Some animal species are especially sensitive to disturbance factor and require special attention.

POLAR BEAR

Female bears with cubs are especially sensitive to human presence during the period of leaving their dens. Young bears cannot move quickly. There are nervous female bears which if they have been very much frightened, can run away and leave the young ones. The period you can most likely meet the bear, is March and April. During these months please be especially attentive, examine the surroundings with binoculars more often, especially when you are on a landrover or snowmobile.

If you meet a female bear, stop, deaden the engine and wait untill the bear takes away the young ones for a large distance or disappears out of sight behind the slope. Safe distance to skirt the bear is 2 km (on landrover or snowmobile) or 0.5-1 km (on foot).

In autumn baby bears are more hardy, but still you should not make bears run away from you for long. In autumn when bears have put on fat, they loose ability for long and intensive muscle tension as the risk of overheating is getting higher. There were incidents when fatty bears died from overheating after the long forced run. Another way you can bring harm to the bear in autumn – is to drive it out into the storming sea. This is especially dangerous for female bears with cubs. Safe distance to skirt the bear in autumn is 1 km.

If you were lucky to watch the hunt of the polar bear or to meet the bear with prey, never scare the bear away or take away its prey.

WALRUS

It is prohibited to approach walrus rookery closer than 1 km without the guide who has permit to work at the rookery. Scaring walruses away from the rookery is a violation of the Reserve's regime which leads to administrative responsibility.

ARCTIC FOX

Female arctic foxes are most sensitive to disturbance factor during the period of whelping and lactation which lasts from middle of May till end of June. Disturbed whelping female fox can change its burrow. Carrying away whelps can lead to death of part of brood. If you come across the fox brood in a hollow or a small burrow, leave this place immediately. During your marchroutes do not stop for rest on the surface of foxes' burrows. To avoid disturbance try to skirt them at a distance of no less then 50-100 meters. Ceiling of some foxes' burrows is so thin that walking above it can cause its falling in and partly destruction of the burrow.

It is prohibited to make encampments above or near burrows, or to leave there things or odorous matter.

It is prohibited to make camps closer than 0.5 km to foxes' burrows. Optimal foxes' barrows exist for hundreds and thousands of years and the number of burrowing areas in Arctic Regions is limited. Making a camp near the burrow can force foxes to leave it and this can cause the death of whelps. Pay your attention to the behaviour of foxes: if you notice a fox which keeps beside you and hails you, change your place even if you didn't manage to see the burrow.

Any damage made to arctic foxes' burrows and actions caused death of whelps lead to administrative responsibility in accordance with actual normative acts.

LEMMINGS

Lemmings' burrows with zoogenic plant groups are (as arctic foxes' burrows) objects of biocoenosis level playing an important role in formation of tundra landscape. Damaging lemmings' burrows is prohibited.

During marchroutes and driving wheel transport be attentive not to run lemmings over.

In connection with probable existence of tularemia infection center at the Wrangel Island, for the safety of field workers it is not recommended to take alive or dead lemmings (without necessity) and to collect food plants near lemming burrows (even in places where it is permitted by the Regulations of the Reserve).

SNOW GOOSE

Even if you have the admission for visit and work at the Reserve's area, you are not allowed to visit snow geese nesting colony without special permit. Administration of the Reserve can allow you to visit it only accompanied by the guide who has special permit and knows how to behave in the colony.

Snow geese are especially vulnerable in brood period – from the moment of hatching out first nestlings till time when all geese have learned to fly. Places of concentration of moulting snow geese at the Wrangel Island are the Academy Tundra, the Southern valley in down-stream of Mamontovaya river and also the valley in mid-stream of Mamontovaya river. Brood period of snow geese lasts from 1st of July till 15th of August. Any transport transference and field work is severely limited and allowed only for persons with permit (knowing special rules of work with snow geese), and to other persons only with special admission of the administration and only with the guide who has the permit.

During work in areas of concentration of moulting geese you should follow these rules:

- you should necessary have binoculars and look round regularly to avoid sudden encounter with moulting geese and to choose optimal course;
- safe distance between standing man and geese is no closer than 2 km;
- in case of sudden encounter with geese at less distance you should sit down or lay on the ground and wait untill geese move away at safe distance. Only after that you can skirt geese and follow your route;
- walk along lower parts of relief – brook and river channels – and keep the water line, so that in case of possible encounter with geese lesser part of your body would be visible;
- nights are preferable for moving across such areas because geese are at rest and get more localized;
- if you are in visibility of geese and notice an arctic fox, stop and sit down or lay on the ground, because anxiousness of geese makes foxes' chances for prey much higher.

Please remember that in the period of learning to fly geese and especially goslings are extremely vulnerable. So the safe date to start field work in areas of geese concentration is when the brood period has ended – after 15th of August.

SNOWY OWL

Snowy owl is one of the species most vulnerable to disturbance factor during nesting period. Period of maximal sensitivity of snowy owl lasts from 15th of May till 30th of July. Presence of man in the area of owls' nesting sites in this period can cause higher nestling death level. Snowy owl's nest is not protected by down and hen-bird incubates its clutch very tightly not leaving it alone for over 5-10 minutes even in warm weather. Neslings get ability for thermoregulation only in June, and before that they get quickly overheated in hot weather and get too cold in cold, especially windy, weather.

Persons working in areas of snowy owls' nesting sites should necessary have binoculars for timely discovering of nests.

Do not approach snowy owls' nests closer than 0.5 km without the necessity of doing special work at the nesting site.

In cases when your work requires presence of man at the snowy owls' nesting site, you should not stay closer than 0.5 km over 30 minutes. If hen-bird has left the nest, you should leave the site and allow it to get back to the nest no later than 20 minutes after it has left.

If this is necessary for your work, you can visit owls' nests only in warm windless weather. It is prohibited to approach nests in cold and/or windy weather.

If your work requires taking pictures or filming snowy owls' nest, use shelter and always be sure that hen-bird returns to the nest no later then 30 minutes after it left. In case if it didn't, you should take away the shelter and leave the nesting site immediately.

Your shelter should be first put at no less than 100 m from the nest approaching it gradually during no less then 4-6 days. You should always be sure that the hen-bird doesn't leave the clutch for over 30 minutes. Remember that if snowy owl gets too much anxious it can leave the clutch.

After nestlings has left the nest you shouldn't stay close to owl's brood (at the distance less then 0.5 km) over 2 hours.

If attacked by aggressive male-bird, you should never wave it away with solid things (stick, binoculars, etc.) – you can kill it. You should dodge a blow bending down or shield your head with soft things (frameless rugsack, jacket, hat, etc.).

Please remember that any actions which have caused the death of mature bird or nestlings are rude violation of the Reserve's regime and lead to administrative responsibility.

TUNDRA BIRDS

During marchroutes be very careful not to crush nests or nestlings.

You should never seek birds' nests on purpose (excluding cases when this is required for special research aims and permitted by the administration of the Reserve in established order), as arctic fox would follow in your tracks and devastate the nest.

Don't be shy to doubt if your behaviour is correct. Don't hesitate to ask specialists for help and consultations on the radio or in private. It is better to ask twice than to prohibit the Reserve's regime and to bring damage to Nature.

Worked out by:
Vice-Director for scientific research N.G. Ovsyannikov

Recommendations:

V.V. Baranjuk
I.E. Menjushina
I.V. Travina

The rules have been considered and confirmed at the staff-meeting of the Reserve's Scientific and Protection Departments at 13th of May, 1992.

ANNEX C
LISTS OF PLANTS AND ANIMALS

1. List of vascular plant species and subspecies of Wrangel and Herald Islands.
2. List of insect species of Wrangel and Herald Islands.
3. List of bird species of Wrangel and Herald Islands.
4. List of mammal species of Wrangel and Herald Islands
5. Endemic plant species and subspecies of Wrangel Island.
6. Endemic animal species and subspecies of Wrangel Island.

List of vascular plant species and subspecies of Wrangel and Herald Islands

Lepidophyta

Lycopodiaceae

Lycopodium selago ssp.arcticum	single foundings

Selaginellaceae

Selaginella sibirica	common

Equisetophyta

Equisetaceae

Equisetum variegatum	very rare
Equisetum arvense ssp.boreale	common
Equisetum scirpoides	rare

Pterophyta

Polypodiaceae

Cystopteris dickieana	rare
Dryopteris fragrans	needs confirmation
Woodsia glabella	single foundings

Angiospermae

Poaceae

1.*Agrostis kudoi*	extremely rare
2.*Alopecurus alpinus ssp.borealis*	common
3.*Arctagrostis arundinaceae*	common
4.*Arctagrostis latifolia*	common
5.*Arctophila fulva*	common
6.*Bromus arcticus*	common locally
7.*Bromus pumpellianus*	common
8.*Calamagrostis deskampsioides*	
9.*Calamagrostis groenlandica*	very rare
10.*Calamagrostis holmii*	common
11.*Calamagrostis kolymensis*	common

12. *Calamagrostis purpurascens*	extremely rare
13. *Deschampsia borealis*	common
14. *Deschampsia brevifolia*	rare
15. *Deschampsia glauca*	rare
16. *Deschampsia komarovii*	rare
17. *Deschampsia sukatschewii*	common locally
18. *Dupontia fisheri*	common
19. *Dupontia psilosantha*	common locally
20. *Festuca auriculata*	common locally
21. *Festuca baffinensis*	common
22. *Festuca brachyphylla*	common
23. *Festuca brevissima*	common
24. *Festuca cryophila*	common locally
25. *Festuca hyperborea*	common
26. *Festuca lenensis*	rare
27. *Festuca rubra*	common locally
28. *Festuca viviparoidea*	common locally
29. *Hierochloe alpina*	common
30. *Hierochloe paucilora*	common
31. *Hierochloe wrangelica*	extremely rare
32. *Hordeum jubatum*	extremely rare
33. *Koeleria asiatica*	common
34. *Leymus interior*	common locally
35. *Phippsia algidiformis*	common locally
36. *Phippsia algida*	common
37. *Phippsia concinna*	
38. *Pleuropogon sabinii*	common locally
39. *Poa abbreviata ssp.abbreviata*	common
40. *Poa abbreviata ssp.jordalii*	common
41. *Poa alpigena ssp.alpigena*	common
42. *Poa alpigena ssp.colpodea*	common
43. *Poa arctica*	common
44. *Poa arctostepporum*	common locally
45. *Poa glauca*	common locally
46. *Poa hartzii*	very rare
47. *Poa lanata*	rare
48. *Poa malacantha*	common
49. *Poa paucispicula*	common locally
50. *Poa pratensis*	common locally
51. *Poa pseudoabbreviata*	common
52. *Poa tolmachevii*	common locally
53. *Poa vrangelica*	common locally
54. *Puccinellia angustata*	common
55. *Puccinellia colpodioides*	common
56. *Puccinellia phryganodes*	common
57. *Puccinellia tenella ssp.tenella*	common
58. *Roegneria alascana*	rare
59. *Roegneria scandica*	rare

60.*Roegneria villosa ssp.coerulea*	common
61.*Roegneria villosa ssp.villosa*	common
62.*Trisetokoeleria jurtzevii*	very rare
63.*Trisetum spicatum*	common
64.*Trisetum wrangelense*	rare

Cyperaceae

65.*Carex atrofusca*	common locally
66.*Carex duriuscula*	extremely rare
67.*Carex glareosa*	very rare
68.*Carex hepburnii*	common locally
69.*Carex lachenali*	common locally
70.*Carex lugens*	common
71.*Carex marina*	common locally
72.*Carex maritima ssp.setina*	common
73.*Carex membranaceae*	common locally
74.*Carex misandra*	common
75.*Carex nesophila*	extremely rare
76.*Carex obtusata*	common locally
77.*Carex podocarpa*	common locally
78.*Carex rariflora*	extremely rare
79.*Carex rigidioides*	very rare
80.*Carex rupestris*	common
81.*Carex saxatilis ssp.laxa*	common locally
82.*Carex scirpoidea*	common locally
83.*Carex spaniocarpa*	extremely rare
84.*Carex stans*	common
85.*Carex subspathacea*	very rare
86.*Carex ursina*	common locally
87.*Carex vaginata ssp.quasivaginata*	very rare
88.*Eleocharis acicularis*	extremely rare
89.*Eriophorum brachyantherum*	extremely rare
90.*Eriophorum callitrix*	common locally
91.*Eriophorum medium*	common locally
92.*Eriophorum polystachyon*	common
93.*Eriophorum russeolum*	common locally
94.*Eriophorum russeolum ssp. leiocarpum*	
95.*Eriophorum scheuchzeri*	common locally
96.*Eriophorum triste*	common
97.*Eriophorum vaginatum*	common locally
98.*Kobresia myosuroides*	common
99.*Kobresia sibirica*	very rare
100*Kobresia simpliciuscula .ssp.subholarctica*	very rare

Juncaceae

101.*Juncus albescens*	extremely rare
102.*Juncus biglumis*	common
103.*Juncus castaneus*	very rare
104.*Juncus triglumis*	very rare
105.*Luzula confusa*	common
106.*Luzula nivalis*	common
107.*Luzula tundricola*	common locally

Liliaceae

108.*Allium schoenoprasum*	common
109.*Lloydia serotina*	common
110.*Tofieldia coccinea*	

Salicaceae

111.*Salix arctica*	very rare
112.*Salix arctica ssp.jamu-taridensis*	very rare
113.*Salix chamissonis*	
114.*Salix glacialis*	very rare
115.*Salix glauca ssp.acutifolia*	common
116.*Salix glauca ssp.callicarpae*	common
117.*Salix lanata ssp.richardsonii*	common locally
118.*Salix niphoclada*	very rare
119.*Salix phlebophylla*	common
120.*Salix polaris*	common
121.*Salix pulchra*	common
122.*Salix reptans*	common
123.*Salix reticulata*	common
124.*Salix rotundifolia*	common
125.*Salix stolonifera ssp.carbonicola*	very rare

Polygonaceae

126.*Koenigia islandica*	common locally
127.*Oxyria digyna*	common
128.*Polygonum bistorta ssp.ellipticum*	common locally
129.*Polygonum viviparum*	common
130.*Rumex acetosa ssp.pseudooxyria*	common
131.*Rumex arcticus*	common
132.*Rumex graminifolius*	common locally

Portulacaceae

133.*Claytonia acutifolia*	extremely rare

134. *Claytonia arctica* — common
135. *Claytoniella vassilievii ssp.petrovskii* — extremely rare

Caryophillaceae

136. *Arenaria capillaris* — common locally
137. *Cerastium alpinum* — rare
138. *Cerastium arvense* — common
139. *Cerastium beeringianum* — common locally
140. *Cerastium bialynickii* — common
141. *Cerastium jeniseisnse* — very rare
142. *Cerastium maximum* — common locally
143. *Cerastium regelii ssp.regelii* — common
144. *Gastrolychnis affinis* — common
145. *Gastrolychnis angustiflora ssp.tenella* — rare
146. *Gastrolychnis apetala* — common
147. *Gastrolychnis attenuata* — common
148. *Gastrolychnis ostenfeldii* — very rare
149. *Gastrolychnis triflora ssp.wrangelica* — extremely rare
150. *Honckenya peploides ssp.diffusa* — common locally
151. *Lychnis villosula* — common locally
152. *Minuartia biflora* — common locally
153. *Minuartia macrocarpa* — common
154. *Minuartia rossii* — common
155. *Minuartia rubella* — common
156. *Sagina intermedia* — common locally
157. *Silene repens* — common
158. *Stellaria ciliatosepala* — common
159. *Stellaria crassifolia* — very rare
160. *Stellaria crassipes* — common locally
161. *Stellaria edwardsii* — common
162. *Stellaria fischeriana* — common locally
163. *Stellaria humifusa* — common
164. *Stellaria laeta* — common locally
165. *Stellaria longipes*
166. *Stellaria monantha* — very rare
167. *Stellaria peduncularis* — rare
168. *Stellaria umbellata* — extremely rare

Ranunculaceae

169. *Aconitum productum* — extremely rare
170. *Anemone drummondii*
171. *Anemone narcissiflora ssp.sibirica*
172. *Anemone richardsonii* — extremely rare

173.	*Batrachium trichophyllum ssp.lutulentum*	rare
174.	*Caltha arctica*	common
175.	*Caltha caespitosa*	common locally
176.	*Oxygraphis glacialis*	common
177.	*Pulsatilla multifida*	common locally
178.	*Ranunculus affinis*	common
179.	*Ranunculus gmelinii*	common locally
180.	*Ranunculus grayi*	common
181.	*Ranunculus hyperboreus*	common locally
182.	*Ranunculus nivalis*	common
183.	*Ranunculus pallasii*	extremely rare
184.	*Ranunculus pygmaeus*	common
185.	*Ranunculus samojedorum*	common locally
186.	*Ranunculus spitzbergensis*	extremely rare
187.	*Ranunculus sulphureus*	common
188.	*Ranunculus turneri*	common
189.	*Thalictrum alpinum*	common

Papaveraceae

190.	*Papaver anjuicum*	common
191.	*Papaver atrovirens*	common
192.	*Papaver calcareum*	common locally
193.	*Papaver chionophilum*	common
194.	*Papaver cornwallisens*	
195.	*Papaver gorodkovii*	common
196.	*Papaver lapponicum ssp.orientale*	common
197.	*Papaver lapponicum ssp.porsildii*	common locally
198.	*Papaver multiradiatum*	common
199.	*Papaver nudicaule ssp.insulare*	common locally
200.	*Papaver paucistaminum*	rare
201.	*Papaver polare*	common locally
202.	*Papaver pulvinatum ssp. pulvinatum*	
203.	*Papaver pulvinatum ssp.interius*	common locally
204.	*Papaver pulvinatum ssp.tschuktschorum*	common
205.	*Papaver radicatum ssp.occidentale*	common
206.	*Papaver schamurinii*	common
207.	*Papaver uschakovii*	common locally

Brassicaceae

208.	*Arabis septentrionalis*	common
209.	*Braya aenea ssp.pseudoaenea*	very rare

210.*Braya pilosa*	common
211.*Braya purpurascens*	common locally
212.*Braya thorild-wulfii*	very rare
213.*Cardamine bellidifolia*	common
214.*Cardamine digitata*	common
215.*Cardamine pratensis ssp.angustifolia*	common locally
216.*Cardamine purpurea*	rare
217.*Cochlearia arctica*	common
218.*Cochlearia groenlandica*	common
219.*Descurainia sophioides*	rare
220.*Draba aleutica ssp.arctoberingensis*	common locally
221.*Draba alpina*	common
222.*Draba arctica*	common
223.*Draba arctogena*	rare
224.*Draba barbata*	common
225.*Draba cinerea*	common
226.*Draba crassifolia*	very rare
227.*Draba flagnizensis*	common locally
228.*Draba groenlandica*	rare
229.*Draba hirta*	common
230.*Draba juvenilis*	common
231.*Draba lactea*	common locally
232.*Draba longocarpa*	rare
233.*Draba macrocarpa*	common
234.*Draba micropetala*	common
235.*Draba nivalis*	common
236.*Draba norvegica*	very rare
237.*Draba oblongata ssp. minuta*	common locally
238.*Draba oblongata ssp. oblongata*	very rare
239.*Draba palanderiana*	common locally
240.*Draba parvisiliquosa*	common locally
241.*Draba pauciflora*	common locally
242.*Draba pilosa*	common
243.*Draba pseudopilosa*	common
244.*Draba subcapitata*	common
245.*Erysimum pallasii*	common locally
246.*Eutrema edwardsii*	common
247.*Lesquirella arctica*	rare
248.*Parrya nudicaulis ssp.nudicaulis*	common
249.*Parrya nudicaulis ssp.septentrionalis*	common

Crassulaceae

250.*Rhodiola rosea ssp.rosea*	common

Saxigragaceae

251.*Chrysosplenium alternifolium ssp. sibirica*	rare
252.*Chrysosplenium rosendahlii*	very rare
253.*Chrysosplenium tetrandrum*	rare
254.*Chrysosplenium wrightii*	common
255.*Saxifraga arctolitoralis*	common
256.*Saxifraga caespitosa*	common
257.*Saxifraga cernua*	common
258.*Saxifraga foliolosa*	common
259.*Saxifraga funstonii*	common
260.*Saxifraga hieracifolia ssp.hieracifolia*	common locally
261.*Saxifraga hieracifolia ssp.longifolia*	common locally
262.*Saxifraga hirculus*	common
263.*Saxifraga hyperborea*	common
264.*Saxifraga monticola*	common locally
265.*Saxifraga nelsoniana*	common locally
266.*Saxifraga nivalis*	common
267.*Saxifraga oppositifolia ssp.smalliana*	common
268.*Saxifraga platysepala*	common
269.*Saxifraga serpyllifolia ssp.serpyllifolia*	common
270.*Saxifraga setigera*	rare
271.*Saxifraga tenuis*	common
272.*Saxifraga unalaschkensis*	
273.*Saxifraga ursina*	common locally

Parnassiaceae

274.*Parnassia kotzebuei*	very rare

Rosaceae

275.*Dryas chamissonis*	common
276.*Dryas incisa*	common
277.*Dryas integrifolia*	common
278.*Dryas punctata ssp. punctata*	common
279.*Novosiversia glacialis*	
280.*Potentilla anachoretica*	common locally
281.*Potentilla arenosa*	common locally
282.*Potentilla biflora*	extremely rare
283.*Potentilla borealis*	extremely rare
284.*Potentilla crebridens ssp.hemicryophila Jurtz.*	common locally
285.*Potentilla elegans*	common locally
286.*Potentilla gorodkovii*	common locally

287.*Potentilla hyparctica ssp.hyparctica*	common
288.*Potentilla hyparctica ssp.nivicola*	common locally
289.*Potentilla mischkinii*	common locally
290.*Potentilla pulchella ssp.gracilicaulis*	common locally
291.*Potentilla pulchella ssp.pulchella*	common locally
292.*Potentilla pulviniformis*	extremely rare
293.*Potentilla safronovae*	extremely rare
294.*Potentilla stipularis*	extremely rare
295.*Potentilla subvahliana*	common
296.*Potentilla tikhomirovii*	very rare
297.*Potentilla tolmachewii*	extremely rare
298.*Potentilla tomentulosa*	extremely rare
299.*Potentilla tschucotica*	very rare
300.*Potentilla uniflora*	common
301.*Potentilla uschakovii*	extremely rare
302.*Potentilla wrangelii*	extremely rare
303.*Sanguisorba officinalis*	very rare

Fabaceae

304.*Astragalus alpinus ssp.arcticus*	common
305.*Astragalus pseudoadsurgens*	very rare
306.*Astragalus tolmaczevii*	common
307.*Astragalus tugarinovii*	extremely rare
308.*Astragalus umbellatus*	common
309.*Hedysarum dasycarpum*	very rare
310.*Hedysarum hedysaroides ssp.tschuktschorum*	rare
311.*Lathyrus maritimus ssp. pubescens*	
312.*Oxytropis borealis*	
313.*Oxytropis czukotica*	common
314.*Oxytropis gorodkovii*	common
315.*Oxytropis maydelliana ssp. maydelliana*	common locally
316.*Oxytropis mertensiana*	common locally
317.*Oxytropis middendorffii ssp.submiddendorffii*	common
318.*Oxytropis sordida ssp.schamurinii*	very rare
319.*Oxytropis uniflora*	extremely rare
320.*Oxytropis uschakovii*	common
321.*Oxytropis wrangelii*	common

Onagarceae

322.*Chamerion latifolium*	common locally
323.*Epilobium arcticum*	common locally

Hippuridaceae

324.*Hippuris lanceolata*	very rare

Apiaceae

325.*Bupleurum triradiatum ssp. arcticum*	
326.*Cnidium cnidiifolium*	rare

Pyrolaceae

327.*Orthilia obtusata*	extremely rare
328.*Pyrola rotundifolia*	very rare

Ericaceae

329.*Cassiope tetragona*	common
330.*Ledum decumbens*	extremely rare

Vacciniaceae

331.*Vaccinium uliginosum ssp.microphyllum*	very rare
332.*Vaccinium vitis-idaea ssp.minus*	very rare

Primulaceae

333.*Androsace chamaejasme ssp.arctisibirica*	common
334.*Androsace ochotensis*	common
335.*Androsace septentrionalis*	common locally
336.*Dodecation frigidum*	
337.*Primula borealis*	common
338.*Primula tschuktschorum*	common

Plumbaginaceae

339.*Armeria maritima*	common

Gentianaceae

340.*Comastoma tenellum*	common
341.*Gentianella propinqua ssp. arctophila*	extremely rare

Polemoniaceae

342.*Polemonium acutiflorum*	common locally

343.*Polemonium boreale*	common

Boraginaceae

344.*Eritrichium sericeum ssp.arctisibiricum*	common locally
345.*Mertensia maritima*	rare
346.*Myosotis asiatica*	common

Scrophulariaceae

347.*Castilleja elegans*	common locally
348.*Lagotis glauca*	common locally
349.*Lagotis minor*	common
350.*Pedicularis albolabiata*	common locally
351.*Pedicularis amoena*	common locally
352.*Pedicularis capitata*	common locally
353.*Pedicularis hirsuta*	very rare
354.*Pedicularis langsdorfiii*	common
355.*Pedicularis novaiae-zemliae*	common
356.*Pedicularis oederi*	
357.*Pedicularis sudetica*	common locally
358.*Pedicularis verticillata*	common
359.*Pedicularis villosa*	common

Valerianaceae

360.*Valeriana capitata*	common

Campanulaceae

361.*Campanula tschuktschorum*	extremely rare
362.*Campanula uniflora*	common locally

Asteriaceae (Compositae)

363.*Antennaria friesiana ssp.friesiana*	common locally
364.*Arctanthemum arcticum ssp.polare*	extremely rare
365.*Arnica frigida*	rare
366.*Arnica iljinii*	rare
367.*Artemisia arctica ssp.ehrendorferi*	common locally
368.*Artemisia arctisibirica*	extremely rare
369.*Artemisia borealis*	common
370.*Artemisia furcata*	common
371.*Artemisia globularia*	
372.*Artemisia glomerata*	common
373.*Artemisia richardsoniana*	common

374. *Artemisia tilesii*	common locally
375. *Aster alpinus*	common
376. *Crepis nana*	common locally
377. *Erigeron compositus*	rare
378. *Erigeron komarovii*	common locally
379. *Erigeron muirii*	
380. *Nardosmia frigida*	common
381. *Nardosmia glacialis*	common locally
382. *Saussurea angustifolia*	
383. *Saussurea tilesii*	common
384. *Saussurea viscida ssp. yukonensis*	
385. *Senecio arctisibiricus*	extremely rare
386. *Senecio atropurpureus*	common
387. *Senecio congestus*	common locally
388. *Senecio frigidus*	common
389. *Senecio fuscatus*	
390. *Senecio hyperborealis ssp.wrangelica*	rare
391. *Senecio integrifolius*	rare
392. *Taraxacum alaskanum*	very rare
393. *Taraxacum arcticum*	common
394. *Taraxacum ceratophorum*	common
395. *Taraxacum hyparcticum*	very rare
396. *Taraxacum korjakorum*	very rare
397. *Taraxacum lateritium*	common
398. *Taraxacum lyngeanum*	very rare
399. *Taraxacum macilentum*	common
400. *Taraxacum nanaunii*	extremely rare
401. *Taraxacum petrovskyi*	extremely rare
402. *Taraxacum phymatocarpum*	common
403. *Taraxacum pseudoplatylepium*	rare
404. *Taraxacum sibiricum*	common locally
405. *Taraxacum tamarae*	common locally
406. *Taraxacum tolmaczevii*	very rare
407. *Taraxacum uschakovii*	rare
408. *Taraxacum wrangelicum*	very rare
409. *Tripleurospermum hookeri*	very rare

List of insect species of the Wrangel and Herald Islands

Ephemeroptera

Baetidae	*2 species*

Plecoptera

Capniidae	*2 species*
Nemouridae	*1 specie*
Perlodidae	*1 specie*

Mallophaga

Philopteridae	*no less than 6 species*

Homoptera

Delphacidae

Achorotile caecianta Emeljanov	rare

Cicadellidae

Anthysanella progufa Anufr.et Em.	steppe plots
Hardya youngi Bier.	common
Streptanus marginatus (Kbm.)	common

Aphalaridae

Aphalara wrangelii Gegechkori	rare

Aphididae	*no less than 2 species*

Heteroptera

Saldida

Calacanthya trybomi (Sahlb)	common
Chiloxantus stellatus (Curt.)	common

Miridae

Chlamydatus wilkinsoni (Dgl.et Sc.)	rare

Orthotulus bermani Kerzn.	common, endemic of Chukot peninsula

Coleoptera

Carabidae

Amara arcticola Popp.	flood plains of southern and central areas
Amara glacialis Mann.	numerous
Amara quensili (Schoenh.)	rare
Amara sp.	rare
Bembidion hasti C.Sahlb.	common at flood plains
Bembidion crenulatum R.Sahlb.	common at flood plains
Carabus truncaticollis Eschsch.	in steppe communities
Curtonotus alpinus (Payk.)	numerous
Curtonotus bokori (Csiki)	rare
Pterostichus brevicornis Kirby	in steppe communities
Pterostichus maclini Popp.	
Pterostichus nigripalpis Popp.	common locally
Pterostichus pinquedineus Eschsch.	numerous
Pterostichus ventricosus Eschsch.	
Pterostichus agonus Horn.	rare
Pterostichus cancellatus Men.	
Pterostichus rubripes Motsch.	common
Pterostichus sublaevis J.Sahlb	

Dytiscidae

Gaurodytes nigripalpis J.Sahlb.
Hydroporus acutangulus Thoms.

Catopidae

Catops poppiusi Jeann.	
Staphylinidae	
Boreaphilus nordenskioldi Makl.	rare
Coryphium hyperboreum Makl.	rare
Micralymma dicksoni Makl.	numerous
Mycetoporus sp.	rare
Phloconomus planus (Payk.)	unrare locally
Stenus miserandus Ryn.	local
Stenus strandi Benick.	local
Tachinus brevipennis J.Sahlb.	numerous
Omaliinae gen.sp.	rare
Atheta spp.	no less than 2 species
Byrrhidae	
Byrrhus pilula L.	rare
Morychus viridis Kuz.et Korot.	rare
Simplocaria sp.	rare
Melyridae	
Troglocollops arcticus (L.Medv.)	only in steppe
Elateridae	
Negastrius latissimus (Tsher.)	local, rare
Elateridae gen.sp.	
Coccinellidae	
Nephus bipunctatus Kugel.	very rare, in steppe
Lathridae	

Corticaria sp.

Chrysomelidae

Chrysolina arctica L.Medv.	rare, на западе и юге
Chrysolina brunnicornis vrangeliani Vor.	rare
Chrysolina cavigera J.Sahlb.	common
Chrysolina septentrionalis Men.	common
Chrysolina subsulcata Mannh.	numerous
Chrysomela blaisdelli wrangeliana L.Medv.	common in central areas
Hydrothrassa hannoverana F.	rare

Curculionidae[1]

Apion arcticum Korot.	common locally
Apion wrangelianum Korot.	common
Ceutorhynchus barkalovi Korot.	rare
Ceutorhynchus olgae Korot.	unrare locally
Coniucleonus astragali T.-Min.et Korot.	rare
Dorytomus rufulus Makl.	rare
Lepyrus canadensis Casey.	common
Hypera elongatus Payk.	common
Hypera ornatus Cap.	common
Rhynchaenus arcticus Korot.	numerous
Sitona ovipennis Korot.	rare

Trichoptera

Brachycentridae	*1 specie*
Limnephilidae	*2 species*

Lepidoptera

Pieridae-Белянки

Colias nastes	unrare

Lycaenidae

Lycaena phlaeas L.	common

[1] - представителей рода Apion в последнее время выделяют в самостоятельное семейство - Apionidae.

Polyommatus aquilo Bsd.	rare

Nunphalidae

Boloria chariclea butleri Edw.	
Boloria distincta Gibs.	
Boloria freiya Thnb.	rare
Boloria frigga Thnb.	rare
Boloria napaena Hoffmnnsg.	common
Boloria polaris Bsd.	numerous
Boloria thore Hbn.	rare

Satyridae

Erebia fasciata Btlr.	common
Erebia rossi Curt.	rather rare
Erebia youngi Holland	
Oeneus melissa karae Kusnz.	
Oeneus polixenes	common

Geometridae

Entephria byssata Aur.	
Entephria sp.	
Psychophora sabini frigidaria Quen.	common
Rheumaptera subhustata Nolck.	
Semiaspilates orciferarius Malker.	rather rare

Lymantriidae

Dicallomera kuznezovi Lukh.et Khruleva.	endemic
Gynaephora lugens Kozh.	

Noctulidae

Agrotis ruta Ev.

Apamea zeta Tr.

Lasionycta leucocycla Stgr.

Lasionycta staidingeri Moschl.

Parabarrovia keeli Gibs.

Pleusea sp.

Polia richardsoni Curt.

Xestia brachiptera (Kon.) numerous

Xestia liquidaria (Ev.) common

Xestia lyngei Rbl.

Xestia thula Laf.et Kon.

Arctiidae

Acerbia alpina Quens.	common
Eilema hyalinofuscatum Tshistjakov.	common
Grammia quenseli Payk.	
Grammia olga Dubatolov	endemic
Holoarctica puengeleri	
Hyperborea czekanowskii Gr.-Gr.	rare
Pararctia lapponica Thnb.	rare

Pterophoridae

Leoptilus wrangelensis Zagulaev

Coleophoridae

Klirnessa tundrosa

Besides, fauna of **Lepidoptera** is also presented by ***Tortricidae, Pyralididae, Plutellidae*** families.

Hymenoptera

Pteromalidae	1 specie
Tenthredinidae - Пилильщики	3 genuses
Proctotrupidae	1 specie

Diariidae	1 specie
Ichneumonidae	over 25 species, including 2 endemic

Apidae

Bombus arcticus Kby.	numerous
Bombus glacialis Sp.Schr.	numerous
Bombus hyperboreus eskimo Schor.	numerous

Diptera

Trichoceridae

Trichocera arctica Lundstr.
Trichocera borealis Lack.
Trichocera columbiana Al.

Tipulidae

Prionocera lapponica Tjed.
Tipula salicetorum Siebhe.
Tipula carinifrons Holm.
Tipula cineracea Coq.
Tipula crawfordi Al.
Tipula katmaiensis Al.
Tipula middendorffi Lack.
Tipula pribilofansis Al.
Tipula glaucocinerea Lindstr.
Tipula arctica Curt.
Tipula wrangeliana Stack.
Tipula anceps Sav.
Tipula lionota Holm.
Tipula ciliata Lindstr.

Chironomidae	about 20 species
Simuliidae	1 specie
Bolitophilidae	1 specie
Mycetophilidae	3 species

Syrphidae

Melangina sp.
Platycheirus angustitarsis Kan.
Syrphus corollae F.
Syrphus dryadis Holm.

Syrphus tarsatus Zett.
Syrphus torvus Osten-Sacken
Syrphus punctifer Frey.

Scathophagidae	3 species
Muselidae	6 species of Spilogona genus
Calliphoridae	1 specie
Heleomyzidae	3 species
Tachinidae	2 species

Besides, fauna of **Diptera** is presented by ***Sciaridae, Bibionidae, Empididae, Anthomyiidae, Rhagionidae, Uestridae, Piophilidae, Hypodermatidae, Oestridae*** families.

Single forms found in human dwellings and nearby, like ants Lasius niger and Formica subpilosa, wasp Dolichovespula norvegica, beatle Tetropium sp.(Cerambycidae), white butterfly Colias palaeno, were not included into the list.

List of bird species of the Wrangel and Herald Islands

Gaviiformes

1.*Gavia adamsii*	rare passage, rare
2.*Gavia arctica*	accidental passage, rare
3.*Gavia immer*	accidental passage, rare
4.*Gavia pacifica*	accidental passage, rare
5.*Gavia stellata*	episodical nesting, rare

Procellariiformes

6.*Fulmarus glacialis*	during migrations, rare
7.*Puffinus griseus*	during migrations, rare
8.*Puffinus tenuirostris*	during migrations, rare

Pelecaniformes

9.*Phalacrocorax pelagicus*	regularly nesting, common

Anseriformes

10.*Anas acuta*	episodical nesting, rare
11.*Anas americana*	accidental passage, rare
12.*Anas carolinensis*	accidental passage, rare
13.*Anas clypeata*	accidental passage, rare
14.*Anas crecca*	accidental passage, rare
15.*Anas formosa*	accidental passage, rare
16.*Anas penelope*	accidental passage, rare
17.*Anas platyrhynchos*	accidental passage, rare
18.*Anas querquedula*	accidental passage, rare
19.*Anser albifrons*	accidental passage, rare
20.*Anser erythropus*	accidental passage, rare
21.*Anser fabalis*	accidental passage, rare
22.*Aythya fuligula*	accidental passage, rare
23.*Aythya marila*	accidental passage, rare
24.*Branta bernicla*	accidental passage, rare
25.*Branta canadensis*	rare passage, rare
26.*Branta nigricans*	regularly nesting, common
27.*Chen caerulescens*	regularly nesting, common
28.*Chen rossi*	accidental passage, rare
29.*Clangula hyemalis*	regularly nesting, common
30.*Cygnus bewickii*	episodical nesting, rare
31.*Histrionicus histrionicus*	accidental passage, rare

32.*Melanitta nigra*	accidental passage, rare
33.*Philacte canagica*	accidental passage, rare
34.*Polysticta stelleri*	episodical nesting, rare
35.*Rufibrenta ruficollis*	accidental passage, rare
36.*Somateria fischeri*	accidental passage, rare
37.*Somateria mollissima*	regularly nesting, common
38.*Somateria spectabilis*	regularly nesting, common

Falconiformes

39.*Aquila chrysaetos*	accidental passage, rare
40.*Buteo lagopus*	accidental passage, rare
41.*Falco columbarius*	accidental passage, rare
42.*Falco peregrinus*	probably nesting, rare
43.*Falco rusticolus*	episodical nesting, rare
44.*Falco tinnunculus*	accidental passage, rare
45.*Haliaeetus albicilla*	accidental passage, rare

Gulliformes

46.*Lagopus lagopus*	accidental passage, rare

Gruiformes

47.*Grus canadensis*	probably nesting, rare

Charadriiformes

Limicolae

48.*Actitis macularia*	accidental passage, rare
49.*Arenaria interpres*	regularly nesting, common
50.*Arenaria melanocephala*	accidental passage, rare
51.*Calidris acuminata*	accidental passage, rare
52.*Calidris alba*	accidental passage, rare
53.*Calidris alpina*	regularly nesting, common
54.*Calidris bairdii*	regularly nesting, rare
55.*Calidris canutus*	regularly nesting, common
56.*Calidris ferruginea*	probably nesting, rare
57.*Calidris mauri*	accidental passage, rare
58.*Calidris melanotos*	regularly nesting, common
59.*Calidris ptilocnemis*	accidental passage, rare

60.*Calidris pusilla* accidental passage, rare

61.*Calidris ruficollis* episodical nesting, rare

62.*Calidris temminckii* episodical nesting, rare

63.*Calidris tenuirostris* accidental passage, rare

64.*Charadrius hiaticula* episodical nesting, rare

65.*Charadrius mongolus* accidental passage, rare

66.*Charadrius semipalmatus* episodical nesting, rare

67.*Eudromias morinellus* episodical nesting, rare

68.*Gallinago gallinago* accidental passage, rare

69.*Heteroscelus brevipes* accidental passage, rare

70.*Heteroscelus incanus* accidental passage, rare

71.*Limnodromus scolopaceus* regularly nesting, common

72.*Limosa lapponica* rare passage, rare

73.*Limosa limosa* accidental passage, rare

74.*Numenius phaeopus* accidental passage, rare

75.*Phalaropus fulicarius* regularly nesting, common

76.*Phalaropus lobatus* episodical nesting, rare

77.*Phalaropus tricolor* accidental passage, rare

78.*Philomachus pugnax* episodical nesting, rare

79.*Pluvialis dominica* episodical nesting, rare

80.*Pluvialis fulva* regularly nesting, rare

81.*Pluvialis squatarola* regularly nesting, common

82.*Tringa erythropus* accidental passage, rare

83.*Tringa flavipes* accidental passage, rare

84.*Tringa glareola* accidental passage, rare

85.*Tringa melanoleuca* accidental passage, rare

86.*Tringa nebularia* accidental passage, rare

87.*Tryngites subruficollis* regularly nesting, rare

Lari

88.	*Larus argentatus*	episodical nesting, rare
89.	*Larus canus*	accidental passage, rare
90.	*Larus glaucoides*	accidental passage, rare
91.	*Larus hyperboreus*	regularly nesting, common
92.	*Larus philadelphia*	accidental passage, rare
93.	*Larus ridibundus*	accidental passage, rare
94.	*Larus schistisagus*	rare passage, rare
95.	*Pagophila eburnea*	during migrations, common
96.	*Rhodostethia rosea*	during migrations, common
97.	*Rissa trydactila*	regularly nesting, common
98.	*Stercorarius longicaudus*	regularly nesting, common
99.	*Stercorarius parasiticus*	episodical nesting, rare
100.	*Stercorarius pomarinus*	regularly nesting, common
101.	*Sterna paradisaea*	regularly nesting, common
102.	*Xema sabini*	regularly nesting, common

Alci

103.	*Aethia cristatella*	accidental passage, rare
104.	*Aethia pusilla*	during migrations, rare
105.	*Alle alle*	accidental passage, rare
106.	*Brachyramphus brevirostris*	during migrations, rare
107.	*Cepphus grylle tajanii*	regularly nesting, common
108.	*Fratercula corniculata*	regularly nesting, rare
109.	*Lunda cirrhata*	episodical nesting, rare
110.	*Uria aalge*	regularly nesting, common

111.*Uria lomvia*	regularly nesting, common

Strigiformes

112.*Asio flammeus*	episodical nesting, rare
113.*Nyctea scandiaca*	regularly nesting, common
114.*Surnia ulula*	accidental passage, rare

Apodiformes

115.*Apus pacificus*	accidental passage, rare
116.*Selasphorus rufus*	accidental passage, rare

Piciformes

117.*Dendrocopos minor*	accidental passage, rare

Passeriiformes

118.*Acanthis flammea*	probably nesting, rare
119.*Acanthis hornemanni*	regularly nesting, common
120.*Ammodramus sandwichensis*	rare passage, rare
121.*Anthus cervinus*	accidental passage, rare
122.*Anthus rubescens*	rare passage, rare
123.*Calcarius lapponicus*	regularly nesting, common
124.*Catharus guttata*	accidental passage, rare
125.*Catharus minimus*	rare passage, rare
126.*Catharus ustulatus*	accidental passage, rare
127.*Corvus corax*	episodical nesting, common
128.*Corvus corone*	accidental passage, rare
129.*Corvus frugilegus*	accidental passage, rare
130.*Delichon urbica*	accidental passage, rare

131. *Dendroica coronata*	accidental passage, rare
132. *Emberiza aureola*	accidental passage, rare
133. *Emberiza pallasi*	accidental passage, rare
134. *Emberiza pusilla*	accidental passage, rare
135. *Eremophila alpestris*	accidental passage, rare
136. *Euphagus carolinus*	accidental passage, rare
137. *Hirundo daurica*	accidental passage, rare
138. *Hirundo rustica*	rare passage, rare
139. *Ixoreus naevius*	rare passage, rare
140. *Junco hyemalis*	rare passage, rare
141. *Junco oreganus*	accidental passage, rare
142. *Lanius cristatus*	accidental passage, rare
143. *Lanius exubitor*	accidental passage, rare
144. *Loxia leucoptera*	accidental passage, rare
145. *Luscinia svecica*	rare passage, rare
146. *Motacilla alba*	episodical nesting, rare
147. *Motacilla flava*	probably nesting, rare
148. *Oenanthe oenanthe*	episodical nesting, rare
149. *Parus cinctus*	accidental passage, rare
150. *Passerela iliaca*	accidental passage, rare
151. *Petrochelidon pyrrhonota*	rare passage, rare
152. *Phylloscopus borealis*	probably nesting, rare
153. *Phylloscopus collybita*	accidental passage, rare
154. *Pinicola enucleator*	accidental passage, rare
155. *Plectrophenax nivalis*	regularly nesting, common numerous
156. *Prunella montanella*	accidental passage, rare
157. *Regulus calendula*	accidental passage, rare

158.	*Riparia riparia*	accidental passage, rare
159.	*Sitta canadensis*	accidental passage, rare
160.	*Spizella arborea*	rare passage, rare
161.	*Spizella passerina*	accidental passage, rare
162.	*Tachycineta bicolor*	rare passage, rare
163.	*Tarsiger cyanurus*	accidental passage, rare
164.	*Turdus iliacus*	accidental passage, rare
165.	*Turdus naumanni*	accidental passage, rare
166.	*Turdus obscurus*	accidental passage, rare
167.	*Turdus pilaris*	accidental passage, rare
168.	*Zonotrichia atricapilla*	accidental passage, rare
169.	*Zonotrichia leucophrys*	rare passage, rare

List of mammal species of the Wrangel and Herald Islands

Rodentia

1.	*Dicrostonyx vinogradovi*	common
2.	*Lemmus sibiricus portenkoi*	common
3.	*Mus musculus*	periodically brought with cargo
4.	*Rattus norvegicusi*	periodically brought with cargo

Cetacea

5.	*Orcinus orca*	extremely rare entry
6.	*Delphinapterus leucas*	rare during autumn migrations
7.	*Eschrichtius gibbosus*	common in autumn
8.	*Balaena mysticetus*	extremely rare accidental entry
9.	*Megaptera novaeangliae*	extremely rare accidental entry
10	*Balaenoptera physalus*	extremely rare accidental entry

Carnivora

11	*Canis lupus*	rare entry
12	*Alopex lagopus*	common
13	*Vulpes vulpes*	extremely rare entry
14	*Ursus maritimus*	common
15	*Gulo gulo*	rare

Pinnipedia

16	*Odobenus rosmarus*	common in summer-autumn
17	*Erignatus barbatus*	common in summer
18	*Phoca hispida*	common
19	*Phoca fasciata*	single foundings
20	*Phoca largha*	single foundings

Artiodactyla

21	*Rangifer tarandus*	introducted specie, common
22	*Ovibos moschatus*	introducted specie, common

Endemic plant species and subspecies of Wrangel Island

1. ***Hierochloe wrangelica*** (Poaceae) - extremely rare, 6 small micropopulations in the upperflow of Neizvestnaya river;
2. ***Poa vrangelica*** (Poaceae) - unrare;
3. ***Puccinellia colpodioides*** (Poaceae) – common all over the island;
4. ***Roegneria villosa ssp. coerulea*** (Poaceae) – unrare, in central part of the island;
5. ***Trisetum wrangelense*** (Poaceae) – unrare, in central and southern parts of the island;
6. ***Salix stolonifera ssp. carbonicola*** (Salicaceae) – rare, at southern coast;
7. ***Claytoniella vassilievii ssp.petrovskii*** (Portulacaceae) – not numerous within one plot (near Somnitel'naya bay);
8. ***Gastrolychnis triflora ssp.wrangelica*** (Caryophyllaceae) – rare, two points at Somnitel'naya bey;
9. ***Papaver atrovirens*** (Papaveraceae) – rare, at the west and sounth of the island;
10. ***Papaver calcareum*** (Papaveraceae) - common in mountain areas;
11. ***Papaver chionophilum*** (Papaveraceae) - common;
12. ***Papaver multiradiatum*** (Papaveraceae) - common all over the island;
13. ***Papaver nudicaule ssp. insulare*** (Papaveraceae) - редок;
14. ***Potentilla uschakovii*** (Rosaceae) - extremely rare, single micropopulation in the upperflow of Somnitel'naya river;
15. ***Potentilla wrangelii*** (Rosaceae) – rare, few small micropopulations in the upperflow of Neizvestnaya river;
16. ***Oxytropis uniflora*** (Fabaceae) - very rare, few small micropopulations in the upperflow of Neizvestnaya river;
17. ***Oxytropis uschakovii*** (Fabaceae) - common;
18. ***Senecio hyperborealis ssp. wrangelica*** (Asteraceae) – rare, at the central part of the island;
19. ***Taraxacum nanaunii*** (Asteraceae) – rare, found at two points (lowerflow of Mammontovaya river and river Somnitel'naya basin);
20. ***Taraxacum pseudoplatylepium*** (Asteraceae) - very rare;
21. ***Taraxacum tolmaczevii*** (Asteraceae) – rare;
22. ***Taraxacum uschakovii*** (Asteraceae) – rare;
23. ***Taraxacum wrangelicum*** (Asteraceae) - very rare;

Endemic animal species and subspecies of Wrangel Island

Insects

1. ***Aphalara wrangelii Gegechkori*** *(Aphalaridae,* Homoptera*)* - rare; only in one community near Somnital'naya bay;
2. ***Troglocollops arcticus (L.Medv.)*** (*Melyridae,* Coleoptera) – extremely rare, only in Somnital'naya bay;
3. ***Chrysolina arctica L.Medv.*** (*Chrysomelidae*, Coleoptera) – rather rare;
4. ***Chrysolina brunnicornis vrangeliani Vor.*** (*Chrysomelidae*, Coleoptera) – rather rare;
5. ***Chrysomela blaisdelli wrangeliana L.Medv.*** (*Chrysomelidae*, Coleoptera) – common locally;
6. ***Apion arcticum Korot.*** (*Curculionidae*, Coleoptera) – common locally;
7. ***Apion wrangelianum Korot.*** (*Curculionidae*, Coleoptera) - common;
8. ***Rhynchaenus arcticus Korot.*** (*Curculionidae*, Coleoptera) - numerous;
9. ***Dicallomera kuznezovi Lukh.et Khruleva.*** (*Lymantriidae*, Lepidoptera) - rare;
10. ***Grammia olga Dubatolov*** (*Arctiidae*, Lepidoptera) - rare;
11. ***Leoptilus wrangelensis Zagulaev*** (*Pterophoridae*, Lepidoptera) - rare;
12. ***Klirnessa tundrosa*** (*Coleophoridae*, Lepidoptera) - rare;

Birds

1. ***Cepphus grylle tajani Port.*** *(Alcidae,* Charadriiformes*)* - common;
2. ***Plectrophenax nivalis wlasovae Port.*** (*Emberizidae*, Passeroformes) - numerous;

Mammals

1. ***Dicrostonyx vinogradovi*** *(Microtinae,* Rodentia*)* - numerous;
2. ***Lemmus sibiricus portenkoi*** (*Microtinae*, Rodentia) - numerous;

ANNEX D
SLIDES AND PHOTOS

List of photos

1. Coastal landscape of Wrangel Island (Photo by N.Ovsianikov)
2. Coastal landscape of Wrangel Island (Photo by A. Butorin)
3. Landscape of Wrangel Island (Photo by A. Butorin)
4. Mammoth tusk in the valley of Gusinaya river (Photo by A. Butorin)
5. Landscape of Wrangel Island (Photo by N.Ovsianikov)
6. Rookeries on the western coast of Wrangel Island (Photo by A. Butorin)
7. Snow poppy (Photo by N.Ovsianikov)
8. Pulsatilla multifida (Photo by N.Ovsianikov)
9. Snow goose (Photo by N.Ovsianikov)
10. Brent goose on the nest (Photo by N.Ovsianikov)
12. Knot (Calidris canutus) (Photo by N.Ovsianikov)
13. Eider Duck (Photo by A. Butorin)
14. Snowy owl nestlings (Photo by N.Ovsianikov)
15. Walrus (Photo by N.Ovsianikov)
16. Lemming (Photo by N.Ovsianikov)
17-18. Arctic fox (Photo by N.Ovsianikov)
19-20. Polar bear family (Photo by N.Ovsianikov)
21. Reindeer (Photo by N.Ovsianikov)

ANNEX E
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WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

NATURAL SYSTEM OF WRANGEL ISLAND RESERVE (RUSSIAN FEDERATION) ID Nº 1023 Rev

Background note: The Natural System of Wrangel Island Reserve was nominated in 2000 under the name of "The Natural System of Wrangel Island Sanctuary". IUCN was able to evaluate this site in 2002 when climatic and logistical conditions were favourable to send a mission. In June 2002, just prior to the 27th session of the World Heritage Committee, the State Party withdrew this nomination to review issues associated with its boundaries, particularly in the marine area. A revised nomination document was submitted to the World Heritage Centre in February 2004. This revised nomination is essentially the same as the one proposed in 2000, thus a second field mission was not considered required. However, the boundaries of the marine component of the nominated site have been revised, including only 12 nautical miles of protected marine zone around the islands, and not 24 nautical miles as proposed in the original nomination. This evaluation report considers both the information provided in the original nomination and in the revised nomination submitted in 2004.

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet:** 8 references

ii) **Additional Literature Consulted:** Arctic Council (CAFF - Conservation of Arctic Flora and Fauna Working Group). 2001. **Arctic Flora and Fauna: Status and Conservation**; Talbot, S. Yurtsev, B. Murray, D. Argus, G. Bay, C. Elvebakk, A. 1999. **Atlas of Rare Endemic Vascular Plants of the Arctic**. CAFF Technical Report No. 3; Stishow, M. 2001. **Wrangel Island, the Arctic Enigma**. in Russian Conservation News, No. 25, Centre for Russian Nature Conservation; Beringia Conservation Programme (Anchorage) and WWF-US. (no date) **The Bering Sea Ecoregion**. Washington; Tishkov, A. J. Pagnan, *et al*, 2002. **A Review of Projects Concerning Biodiversity Conservation and the Use of Biological Resources in the Russian Arctic** (in prep.), UNEP and CAFF; Tishkov, A. J. Pagnan, *et al*, 2002. **A Data Base of Ecological Projects in the Russian Arctic** (in prep.) UNEP and CAFF; Pagnan, J., Legare, G. 2002. **Protected Areas of the Arctic: Conserving a Full Range of Values**. CAFF; OGP with Introduction and Environmental Overview by J. Pagnan. 2002. **Arctic Guidelines for Offshore Oil and Gas Exploration and Production**. International Arctic Research Policy Committee of USA. **Artic Research,** Volume 16, Spring/Summer 2002.

iii) **Consultations:** 4 external reviewers. Various Government officials from the Ministry of Natural Resources in Moscow; the district administrator of the Chukotka Autonomous Area; Various staff and specialists of the Wrangel Island Zapovednik; staff from the UNESCO Moscow Office and IUCN office for Russia and the Commonwealth of Independent States.

iv) **Field Visit:** Jeanne Pagnan and Alexei Blagovidov, July/August 2002.

2. SUMMARY OF NATURAL VALUES

2.1 Geographical Location

The Natural System of Wrangel Island Reserve is made up of Wrangel Island (7608.7 km^2), Herald Island[1] (11.3km^2) and a marine area (11,543 km^2) that comprises 12 nautical miles around each island, for a total area of 19,163 km^2. The Islands are located well above the

[1] sometimes written as Gerald Island due to the difference between the Russian and English alphabets

Arctic Circle at 70^{o} N and are surrounded by the East Siberian Sea to the north and west and the Chuckchi Sea to the south and east. They lie 140 km off the northeast coast of the Chukotka mainland. Herald Island lies within the western hemisphere at 175^{o} W whereas Wrangel Island, located from 178^{o} E to 177^{o} W, straddles the 180^{o} meridian and both eastern and western hemispheres. The 180^{o} meridian is marked only by a small pile of rocks on a hill. There is no signage.

2.2 Physical Features

Wrangel Island is mountainous with old, weathered ranges, concentrated in the lower half of the island and generally running in an east-west direction. The central "hump" is jagged and quite high (over 1000m) but gradually resolves into smoother, lower formations towards the coasts ending in the Western and Eastern Plateaux, the extensive low-lying plains of the Tundra Academy in the north and the less expansive tundra plains along the south coast. There is a variety of metamorphic, sedimentary, and shale-type rocks, with some igneous rocks indicating volcanic activity. There are also diverse geological features, including the conical, volcanic-shaped Tundra Mountain in the north, the jagged peaks of the central ridge, the softly silhouetted and heavily eroded mountains of the Mammoth range, the shale formations in the south-west and along the Unexpected River, the crumbling dun-coloured precipices of the Tundra River valley, and the fort-like sand and rust coloured structures of the north slopes. The variety and multiple-hues of these features in a relatively small geographic area, interspersed with an extensive network of valleys and river basins, is visual evidence of the island's long geological history, uninterrupted by glaciation, and is aesthetically both unusual and impressive.

The hydrographic network of Wrangel Island consists of approximately 1,400 rivers over 1km in length; five rivers over 50km long; and approximately 900 shallow lakes, mostly located in the northern portion of Wrangel Island with a total surface area of 80km^{2}. The waters of the East Siberian Sea and the Sea of Chukchi surrounding Wrangel and Herald Islands are classified as a separate chemical oceanographic region. These waters have among the lowest levels of salinity in the Arctic basin as well as a very high oxygen content and increased biogenic elements.

The terrain is not striated, which is further evidence that it was not glaciated during the most recent Quaternary Ice Age , thus confirming its uniqueness in the high Arctic. The ground is underlain with permafrost and a mosaic of tundra and steppe types co-exist in quilt-like patterns. Tundra types range from fields of dry, sparsely vegetated, rounded or shorn hummocks, (indicating an old ocean bottom), mossy hillocks, sheltered meadows with dwarf willows growing over 1 metre high, lush grasslands, numerous wet and marshy areas interspersed with tundra-ponds, various lichen dominated complexes and sections of dry, polar desert with flat, hard-packed soils and gravel.

2.3 Climate

Wrangel Island is influenced by both the Arctic and Pacific air masses. One consequence is the predominance of high winds. The Island is subjected to “cyclonic” episodes characterised by rapid circular winds. It is also an island of mists and fogs.

Average temperatures appear to be rising on Wrangel Island, extreme weather episodes have been increasing and summers are getting wetter. These observations are consistent with findings in other parts of the Arctic and are indicative of an overall Arctic warming trend. Weather conditions on Wrangel are highly variable from one location to another but are only monitored at the meteorological station at Ushakovskoe Village due to a lack of monitoring equipment to expand the meteorological network to other parts of the Reserve.

There are noticeable differences in climate between the northern, central and southern parts of the Island. The central and southern portion is warmer, with some of the valleys having semi-continental climates that support a number sub-Arctic steppe-like meadow species. This is a unique feature in the High Arctic.

According to research reports over the past several years, ice around Wrangel Island has been melting earlier in the spring and the autumn freeze-up has been occurring later. The

number of ice-free years has also been increasing each decade. The warming trend is expected to cause hardship for two of Wrangel Island's most noted species - polar bears, which travel on ice in search of prey seals, and walrus, which depend on ice as platforms to dive for molluscs, their main food. More intensive monitoring is needed to detect impacts of these ice changes to the marine environment of the site.

2.4 Biodiversity

The variety of terrain types offers a range of habitats which accounts, in part, for the higher diversity of plants and animals on Wrangel Island than in most other parts of the Arctic. Other reasons are its history and location. Wrangel Island is a vestigial part of the ancient Bering continent present during the Pleistocene era and was not glaciated during the Quaternary Ice Age. It served as a refuge for Pleistocene species, and remnant species not present elsewhere are still to be found on Wrangel. Another reason is that Wrangel Island is on the intersection of two major continental systems – Asia and North America -and has species from both.

While Wrangel Island approaches a typical tundra region, its flora is unique in terms of its species richness and number of endemic plants. Currently, 417 species and sub-species of vascular plants have been identified on the island, more than the entire Canadian Archipelago and double that of any other arctic tundra territory of comparable size. Some species are derivative of widespread continental forms, others are the result of recent hybridization and 23 are endemic. This is unmatched by any other Arctic island.

Prevailing flora include mustard, rose, buttercup and saxifrage families. Flowering plant species include pink dryads *Dryas punctata*, pasqueflowers *Pulsatilla nuttaliana*, Castellea flowers *Castilleja elegans*, and yellow poppies *Papaver* spp. There are 17 species of Arctic poppies on Wrangel Island, five of which are endemic to the island, including *Papaver gorodkovii* and *P. lapponicum*. Additionally, 331 moss species and 310 lichen species have been identified on Wrangel Island.

The island is the northernmost destination for over a hundred migratory bird and marine mammal species from both Asia and North America. Gray whales and dolphins are present. Birds are plentiful, including various shorebirds (dunlin, Common snipe, Lesser golden and Black-bellied plovers, pectoral sandpipers, red knots, and ruddy turnstones), geese, including both Snow geese and Brent geese, Snowy owls, Eider ducks, Long-tailed and Pomarine skuas (jaeggers), Black, Common and Thick-billed guillemots, Glaucous gulls and kittiwakes, Sabine's gulls, Lapland longspurs, Snow buntings, White wagtails, Peregrine falcons and Gyrfalcons.

Lemming burrows are easily observed throughout the island. Both the collared and the Siberian lemmings are present and they may have evolved into separate sub-species due to their isolation, but this has not yet confirmed by scientific studies. Lemmings are the staple diet for Snowy owls, other raptors and for arctic foxes. Unlike their mainland cousins, the lemming populations on Wrangel do not experience the same fluctuating "boom/bust" population cycles; while there are cyclical declines and increases, they are far less dramatic.

According to palaeontological evidence, muskoxen and reindeer inhabited the island in the late Pleistocene and even later, but have since disappeared. Muskoxen were introduced from Canada during the 1970's and continue to inhabit the island. Reindeer were brought to Wrangel Island in the 1940's to establish a domestic reindeer industry. That practice resulted in severe localised overgrazing, destruction of ancient nesting areas and disruption of the ecological balance. There are differing opinions on whether these two ungulate species are at or beyond the carrying capacity of the island and various options on how to maintain a balance on the populations have been proposed.

The wolf is the natural predator and a small pack used to inhabit the island until the federal government ordered its destruction some years ago to favour the fledgling reindeer herding industry, now abandoned. Since this natural ecological balance was destroyed, questions facing the reserve management are whether to re-introduce wolves, to allow themselves to re-establish themselves naturally (by ice from the mainland) or whether to use some other means of intervention to keep the large ungulate populations in balance. Staff reported that

they are concerned about the negative reaction to wolf re-introduction, since it is still generally a reviled animal in many circles, despite its important ecological role and benefits.

3. COMPARISONS WITH OTHER AREAS

Udvardy (1975) classifies the Wrangel Island complex as High Arctic Tundra of the Eastern Palearctic realm. There are no other High Arctic Tundra natural World Heritage sites at present. In fact, in the existing World Heritage List, tundra and polar systems are the least common biomes.

It is, therefore, necessary to compare this site to other protected areas in the Artic region. For the purpose of this analysis, the definition of the Arctic accepted by the Arctic Council and by IUCN in its Arctic Strategy has been applied. It divides the Arctic into four broad zones: marine; Arctic desert; tundra; and the transition timberline forest, or "forest-tundra" zone, although there are some differences among specialists as to how each zone is delineated. Since, in total, the Arctic region covers nearly 30 million km^2 with over 400 protected areas, this analysis is restricted to a comparison with 12 other Arctic Islands and island complexes within the marine zone, which itself encompasses nearly 15 million km^2.

Of the 13 Arctic islands reviewed, 11 have some level of formal protection and there are approximately 30 protected areas. Some islands such as Wrangel, the New Siberian Islands and Franz Joseph Land are over 95% protected (as IUCN Management Category I). Others such as Severnya Zemlya or Novya Zemlya have no protected areas. Of all the islands and their protected areas, Wrangel has the highest terrestrial and marine biodiversity and productivity. Summary details are provided below.

Marine Biodiversity: There is insufficient readily available data to compare the level of marine productivity and zooplankton biomass at Wrangel with all other Arctic islands. However, based on other parameters such as the high numbers of marine-dependant species, it is reasonable to conclude that other than Iceland and the Aleutians, Wrangel marine productivity and biomass exceeds all other Arctic islands with the possible exception of some coastal areas of Greenland. There is, however, insufficient data and research on the benthic environment of the Arctic islands to do a comparative analysis.

Six marine species were surveyed among the Arctic islands: Arctic charr, Bearded seal, Narwhal, Pacific walrus, Gray whale and polar bear. Of these six, five are found at Wrangel Island, the highest number at any island. Polar bears breed on ten islands, with Wrangel and Svalbard having the highest density. However, Wrangel has a far higher number of dens that Svalbard. Their breeding grounds are fully protected within protected areas on Wrangel and parts of Svalbard, but are not on Novya Zemlya or on some Canadian Islands. The Pacific walrus is found on six Arctic islands but the largest haulouts are at Wrangel, where they are fully protected. They are also protected on Svalbard, the New Siberian Islands and Franz Joseph Land but not on Novya Zemlya or Severnya Zemlya.

Terrestrial Biodiversity*:* Arctic land is classified according to vegetation zones and there are several systems in use. There is a strong correlation between the vegetation zonal classification and productivity. Within the various systems, only Iceland and the Aleutians have higher primary productivity than Wrangel because they both lie within more productive zones. In terms of vegetation, Wrangel is classified either as exclusively Arctic Tundra, Southern Variant, (an anomaly among the Arctic islands), or entirely Arctic desert with more than 5% biomass. Only the New Siberian Islands also fall into this latter category but they are not protected. This classification distinguishes it from Canada's Arctic islands which are classified as Arctic desert but having less than 5% biomass.

Studies have been carried out on the Arctic's rare endemic vascular plants found on only six of the islands. These rare plants occur in the highest density relative to size on Wrangel. Two islands – Wrangel and the Aleutians - have species found only on those islands. There are 21 species occurring only on Wrangel Island whereas four occur only on the Aleutians. All rare endemic vascular plant species on Wrangel are fully protected within a Category I strict nature reserve. Rare plants are also protected on the Aleutians in a Category IV protected

area. However, the rare endemic plants located on other Arctic islands fall primarily outside protected areas, especially those on Svalbard, Greenland and Ellesmere Island.

11 species of terrestrial fauna with wide Arctic distribution were surveyed for their presence on the Arctic islands. The species were Common, King and Steller's eiders, Thick-billed and Common Murre (or Guillemot), Collared and Siberian Lemming, Snow goose, Tundra reindeer, Muskoxen and Wolf. Of the 11 terrestrial fauna species surveyed, ten are found on Wrangel Island, the highest number of any Arctic island or complex. Only the King eider is not found on Wrangel. Wrangel is also the only island where both the Collared Lemming (*Groenlandicus*) and the Siberian Lemming are found. All other islands have either one or the other but not both. Wrangel is also the only Arctic island with an Asian population of the Snow Goose.

4. INTEGRITY

4.1 Boundaries

As noted above, the proposed World Heritage site, including the marine component, is under federal jurisdiction, although there is a "work-sharing" agreement with the Chukot Autonomous Area (or Okrug). The village of Ushakovskoe, (with two resident families, several border guards and eight polar station staff), a section of the surrounding land and the marine zone between the Khistchnikov River and Cape Hawaii are outside the boundaries of the nominated site and reserve and do not come under its strict provisions, including access. However, entry is controlled by a system of permits and enforced by the resident border guards.

4.2 Legal Status

The nominated site is federal property under the Ministry of Natural Resources. Under the Russian system of protected areas, the nominated site, including its terrestrial and marine component, is classified as a "Zapovednik" (IUCN Category Ia, Strict Nature Reserve). This accords it the highest level of protection and excludes practically all human activity other than for scientific purposes. The Zapovednik was established in 1976 as the Wrangel Island State Sanctuary by the State Planning Department of the USSR. At that time all buildings, structures and the reindeer herd were transferred from the Zapovednik by the Ministry of Agriculture. To provide better protection for marine mammals, and following a joint proposal by the Governor of the Chukot Autonomous Region and the State Committee for the Environment, the Reserve was extended to the Territorial Sea (out to the 12 nautical mile limit) in 1997 by federal Decree. In 1999, the Government of the Chukot Autonomous Region recommended a further 24 nautical mile extension to the marine component of the reserve; however this proposal has not been approved at the Federal level.

4.3 Management

In July, 1997, the State Committee for Environmental Protection for the Government of the Russian Federation entered into an Agreement on protected areas with the Administration of the Chukot Autonomous Area (CAA). This delegated much of the authority for the administration of protected areas (including the Wrangel State Nature Reserve) to the CAA. In accordance with that agreement, the CAA is responsible for day-to-day operations of the nominated site, administration of non-Reserve territory, participation in the selection of the Reserve Director, protection of the marine area and enforcement of the marine regulations.

Although the Zapovednik or Reserve has annual work plans, there is no comprehensive management plan for the site. The lack of long-term management planning for the Reserve is not unusual in Russia. In fact, management planning is a relatively new concept in the country and one that needs to be nurtured. Some management tools are in place. In 1992, the Reserve authorities issued: "Rules of Behaviour" for the Reserve, covering waste disposal and including prohibitions and guidelines for the protection of the polar bear, walrus, Arctic fox, lemmings, Snow goose, Snowy owl and other tundra birds. There is no guidance given for the protection of the flora, geological formations or cultural values. In 1997, the Federal authorities approved a set of provisions for the Reserve that describe its functions and the

roles and responsibilities of the staff and scientists. There are strict regulations concerning the marine zone where, for example, shipping is not permitted.

The staff working at the nominated site are federal employees. The senior management team consists of the Director of the Reserve appointed by the Ministry of Natural Resources and the Senior Scientist, appointed by the Director. There are approximately 27 full- and part-time Reserve staff consisting of a core of 8 full-time scientists specialising in Snowy owl, lemmings, Snow geese, ungulates, polar bear, walrus, veterinary science and archaeology, 7 technical staff, 4 rangers, and 8 administrative staff. The rangers reside full-time on Wrangel Island and carry out various tasks, including monitoring, site maintenance and maintaining a watch over the island's permanent settlement. The core staff is supplemented by a number of experts from Moscow and St. Petersburg who carry out research in hydrology, meteorology, geology, botany, palaeontology and marine mammals. The Reserve also brings in university students and scientific expeditions from time to time. There is no human resource plan for the site.

The Reserve has few vehicles, often in poor condition. The staff lacks good repair kits and replacement parts, including tyres. Vehicle and communications breakdowns are a constant challenge and create serious safety concerns at the site. The Reserve also lacks adequate technical communication facilities. Communication on, to and from the island is limited and by radio signal, when conditions permit. There is also a serious problem with management communications with the Reserve's Headquarters in Moscow. The Reserve is not only physically remote, but also quite isolated from federal authorities. This situation poses additional problems for management and coordination.

The Reserve is dependent on oil and generators for all its energy. This is extremely expensive, produces noise and air pollution and supplies cannot always be guaranteed. The Reserve staff stated that wind energy and solar powered energy cells would be a better alternative but they lack adequate funds to implement these options.

Tourism is primarily by cruise ship and subject to permits, as well as strict regulations and access criteria. Ships pull into the island and disembark passengers who roam along the shores outside the Reserve but do not enter the Reserve itself. Tourism into the Reserve is tightly controlled and includes scientific expeditions led by Reserve staff. They are a source of revenue for the Reserve and a means of promoting the Reserve's values. The facilities on the island are primitive and should the island be opened up to more visitation, facilities would have to be upgraded and great care taken to avoid disturbing the wildlife which are especially vulnerable to noise and human disturbance of any kind.

4.4 Research and Monitoring

The Senior Scientist has overall responsibility for the research and monitoring programme of the Reserve. As is the case with Russia's other Nature Reserves, research is a priority on Wrangel Island and there are currently three ongoing research programmes focused on the species for which the island provides unique habitat: Snowy owls, polar bears and Snow geese. For these species there are long data time series available. Work on other species and environmental factors are spotty and very much depend on visiting experts and their interests. For example, there is neither ongoing benthic research nor plans for any, and there has been no vegetation research or monitoring during the past two seasons. One of the reasons is that funding is very limited and the priority has been to keep the Reserve functioning rather than invest in new types of research.

The Reserve could be an important "weather vane" for climate change and to detect environmental changes and adaptations. However, climate is not monitored consistently due, in part, to the lack of automated weather monitoring equipment. There is currently no long-term monitoring plan and it is imperative that both the research and monitoring at the Reserve be improved, be more comprehensive and up to date and be maintained at high quality. The lack of comprehensive research and monitoring plans contribute to the weakness in the Reserve management programme. The Reserve monitoring programme should also be better linked to other Arctic programmes such as the circumpolar caribou/reindeer monitoring programme and migratory marine mammal monitoring in North America.

4.5 Threats and Human Impacts

According to the Reserve staff and federal authorities in Moscow, the polar station and village of Ushakovskoe with its surrounding non-Reserve buffer zone lying just outside the Reserve poses the greatest immediate threat to the Reserve. There has already been damage and the potential for more serious disturbance to the island's ecosystem and wildlife is very real. For instance, the staff at the polar station are rotational and their behaviour is not always sensitive to the vulnerabilities of the island. The Reserve rangers currently spend much of their time observing the activities at Ushakovskoe to minimise environmental damage. There are plans to close down the polar station and to move non-reserve residents off the island.

Enforcement is the main problem since the Reserve has no patrol boats and the Chukot administration enforcement capability is limited, thus unauthorised hunting and poaching is always a serious threat. Other existing or potential threats to the Reserve include activities on the Chukot mainland such as oil slicks from ice-breakers and trawlers, tourism, industrial development on the mainland and the resulting pollution especially from coal burning, chronic lack of funding, lack of adequate technical and communications equipment and weak management systems and planning.

In June 1994, Russia and the United States signed a Memorandum of Understanding for a joint oil and gas lease sale in the Chukchi Sea. The proposed lease sale area came within a short distance of Wrangel Island and surrounded Herald Island. According to federal authorities, the agreement and proposed lease sale have been cancelled. Nevertheless, the situation could change if Russia amends its policy on oil and gas exploration and exploitation. Therefore, should drilling occur in the Chukchi Sea in the future, it needs to be subject to very stringent regulations to protect the Reserve and wildlife migratory routes.

Present day human impact in the Reserve is minimal. The most serious human impacts occurred during the period of settlement prior to the establishment of the Reserve in 1976 and the signs are still visible and will remain so given the climate. During that time, all-terrain vehicles were used indiscriminately and their tracks and a few broken down vehicles are still present on parts of the tundra. The policy now is to use existing tracks and not make new ones. The earlier presence of about 100 residents in Doubtful village and at the neighbouring air strip caused great disturbance to the wildlife and terrain from, for example, noise, pollution, motorised vehicles and hunting pressure. Walrus disappeared from their traditional haul-out on Doubtful Spit during the time the village was inhabited but have recently begun hauling out again and up to 70,000 walrus now use the site.

Another impact has been debris, especially discarded oil drums, used to import the island's main energy supply. Most have now been cleared from the tundra in an ongoing clean-up programme and have been stockpiled near research stations to await removal. The current policy is to remove a drum for every one brought in. There is some unsightly debris and abandoned construction material around Doubtful and the airstrip but it poses no real problem. The Reserve is considering how to clean up the area while preserving the deserted site for its cultural values.

By far the most serious and pervasive human impact has been domestic reindeer herding which caused severe damage to the vegetation and nesting areas, especially Snow geese, which are making a slow recovery now that the herding industry has been closed down. Deserted reindeer herder shacks are now used as research stations and stopovers for reserve staff and expeditions.

A potential threat to the site is associated to an influx of too many people to the island or opening it to activities such as hunting as a means of getting additional funds. Its vulnerable wildlife are already at the upper limits of their species ranges and are unable to compete with high-powered rifles, indiscriminate use of all-terrain vehicles or the disruptive noise and bustle that accompanies most human activity.

5. ADDITIONAL INFORMATION

The nominated site has important palaeontological values. Wrangel Island was home to the last mammoths and according to the staff, tusks and skulls are regularly washed up in river basins. Staff also reported finds of the primeval bison, Prjesalski's horse, the furry rhinoceros and other species. According to the staff, there is palaeontological evidence of a large lake over 100,000 years ago near the Tundra Mountain which would provide an historical incentive for the present-day abundance of Snow geese in the area. Bones left by ancient palaeoeskimo hunters about 2400 years ago can still be observed on the island, as well as bones left in distinctive patterns by native hunters earlier this century.

It is also important to note the cultural values associated to this site. These include a palaeoeskimo site as well as several small deserted reindeer herder's settlements with artefacts intact, and also the deserted village and airfield of Doubtful in which many houses and buildings with all the previous inhabitants' personal belongings, including hand-written letters, books and other objects, are well preserved and quite undisturbed. They tell an interesting story about the inhabitants themselves and their efforts to settle in a remote and very challenging environment. Another interesting aspect of the island's cultural history is that it served as the refuge for the survivors of the great Canadian Arctic Expedition of 1914 and the harrowing journey by their leader, Robert Bartlett, to procure a rescue ship – the *King and Winge*.

6. APPLICATION OF WORLD HERITAGE CRITERIA

The Natural System of Wrangel Island Reserve has been nominated on the basis of natural criteria (ii) and (iv).

Criterion (ii): Ecological process

The nominated site is a self-contained island ecosystem and there is ample evidence that it has undergone a long evolutionary process uninterrupted by the glaciation that swept most other parts of the Arctic during the Quaternary period. The number and type of endemic plant species, the diversity within plant communities, the rapid succession and mosaic of tundra types, the presence of relatively recent mammoth tusks and skulls, the range of terrain types and geological formations in the small geographic space are all visible evidence of Wrangel's rich natural history and its unique evolutionary status within the Arctic. Furthermore, the process is continuing as can be observed in, for example, the unusually high densities and distinct behaviours of the Wrangel lemming populations in comparison with other Arctic populations or in the physical adaptations of the Wrangel Island reindeers, where they may now have evolved into a separate population from their mainland cousins. Species interaction strategies are highly-honed and on display throughout the island, especially near Snowy owl nests which act as protectorates for other species and beacons for migratory species and around fox dens. IUCN considers that the nominated site meets this criterion.

Criterion (iv): Biodiversity and threatened species

The nominated site has the highest level of biodiversity in the high Arctic. Wrangel Island is the breeding habitat of Asia's only Snow goose population which is slowly making a recovery from catastrophically low levels. The marine environment is an increasingly important feeding ground for the Gray whale migrating from Mexico (some from another World Heritage site, the Whale Sanctuary of El Vizcaino). The islands have the largest sea-bird colonies on the Chukchi Sea, are the northernmost nesting grounds for over 100 migratory bird species including several that are endangered such as the Peregrine falcon, have significant populations of resident tundra bird species interspersed with migratory Arctic and non-Arctic species and have the world's highest density of ancestral polar bear dens. Wrangel Island boasts the largest population of Pacific walrus with up to 100,000 animals congregating at any given time at one of the island's important coastal rookeries. Since Wrangel Island contains a high diversity of habitats and climates and conditions vary considerably from one location to another, total reproductive failure of a species in any given year is practically unheard of.

Given the relatively small size of the area, this is very unusual in the high Arctic. IUCN considers that the nominated site meets this criterion.

7. RECOMMENDATIONS

IUCN recommends that the Committee **inscribe** the Natural System of Wrangel Island Reserve on the World Heritage List under natural criteria (ii) and (iv).

The Committee may wish to recommend the State Party to urgently prepare a management plan and implementation strategy, supported by adequate financial resources, that incorporates *inter alia*: technical and management communications; a tourism and visitor strategy; options for alternative energy supply; transportation; a monitoring and research programme; options to preserve the site's cultural and palaeontological features; a human resources policy for the staff working at the site; and a plan to remove unwanted debris from Doubtful Village. The Committee may wish to encourage the State Party to submit, if it wishes to do so, an international technical assistance request to help undertake the actions proposed above. The Committee is advised to request the State Party to invite a mission in 2-3 years time to report on the status of the management plan and to review its implementation.

Finally the Committee may wish to encourage the State Party to consider the possibility of extending the marine component of this site a further 12 nautical miles as proposed in 1999 by the Government of the Chukot Autonomous Region. This extension would add significantly to the protection of the marine biodiversity of the Wrangel Island Reserve.

CANDIDATURE AU PATRIMOINE MONDIAL – ÉVALUATION TECHNIQUE DE L'UICN

Système naturel de la Réserve de l'île de Wrangel (Fédération de Russie) ID N° 1023 Rev

Note d'information: Le Système naturel de la Réserve de l'île Wrangel a été proposé en 2000 sous le nom de « Système naturel du Sanctuaire de l'île Wrangel ». L'UICN a pu évaluer le site en 2002, lorsque les conditions climatiques et logistiques ont permis d'envoyer une mission. En juin 2002, juste avant la 27e session du Comité du patrimoine mondial, l'État partie a retiré cette proposition afin de réexaminer les problèmes relatifs aux limites du site, en particulier dans la zone marine. Une proposition révisée a été soumise, en février 2004, au Comité du patrimoine mondial. Cette proposition révisée étant essentiellement identique à celle de 2000, il n'a pas été jugé nécessaire de conduire une nouvelle mission. Quoi qu'il en soit, les limites de l'élément marin du site proposé ont été révisées pour comprendre 12 milles nautiques protégées autour des îles et non plus 24 comme dans la proposition d'origine. Le rapport d'évaluation tient compte à la fois de l'information contenue dans la proposition d'origine et de celle qui figure dans la proposition révisée soumise en 2004.

1. DOCUMENTATION

i) Fiches techniques UICN/WCMC : 8 références

ii) Littérature consultée : Arctic Council (CAFF - Conservation of Arctic Flora and Fauna Working Group). 2001. **Arctic Flora and Fauna: Status and Conservation**; Talbot, S. Yurtsev, B. Murray, D. Argus, G. Bay, C. Elvebakk, A. 1999. **Atlas of Rare Endemic Vascular Plants of the Arctic**. CAFF Technical Report No. 3; Stishow, M. 2001. **Wrangel Island, the Arctic Enigma**. in Russian Conservation News, No. 25, Centre for Russian Nature Conservation; Beringia Conservation Programme (Anchorage) and WWF-US. (no date) **The Bering Sea Ecoregion**. Washington; Tishkov, A. J. Pagnan, *et al*, 2002. **A Review of Projects Concerning Biodiversity Conservation and the Use of Biological Resources in the Russian Arctic** (in prep.), UNEP and CAFF; Tishkov, A. J. Pagnan, *et al*, 2002. **A Data Base of Ecological Projects in the Russian Arctic** (in prep.) UNEP and CAFF; Pagnan, J., Legare, G. 2002. **Protected Areas of the Arctic: Conserving a Full Range of Values**. CAFF; OGP with Introduction and Environmental Overview by J. Pagnan. 2002. **Arctic Guidelines for Offshore Oil and Gas Exploration and Production**. International Arctic Research Policy Committee of USA. **Artic Research,** Volume 16, Spring/Summer 2002.

iii) Consultations : quatre évaluateurs indépendants. Divers fonctionnaires du ministère des Ressources naturelles à Moscou ; l'administrateur de la République autonome des Tchoukches ; divers employés et spécialistes de la Zapovednik de l'île Wrangel ; personnel du Bureau de l'UNESCO à Moscou et du Bureau national de l'UICN pour la Russie et la Communauté des États indépendants.

iv) Visite du site: Jeanne Pagnan et Alexei Blagovidov. Juillet/août 2002.

2. RÉSUMÉ DES CARACTÉRISTIQUES NATURELLES

2.1 Situation géographique

Le Système naturel de la Réserve de l'île Wrangel se compose de l'île Wrangel (7608,7 km^2), de l'île Gerald (11,3 km^2) et d'une zone maritime (11 543 km^2) qui comprend 12 milles nautiques autour de chaque île, pour une superficie totale de 19 163 km^2. Les îles sont situées bien au-dessus du cercle arctique, à 70º N, et sont entourées par la mer de Sibérie

orientale au nord et à l'ouest et la mer des Tchouktches au sud et à l'est. Elles se trouvent à 140 km au large de la côte nord-est du secteur continental de la République autonome des Tchouktches. L'île Gerald se trouve dans l'hémisphère occidental à 175º O tandis que l'île Wrangel, située entre 178º E et 177º O, chevauche le méridien de 180º et les deux hémisphères, oriental et occidental. Le méridien de 180º est indiqué uniquement par une petite pile de roches sur une colline. Il n'y a pas d'indication.

2.2 Caractéristiques physiques

L'île Wrangel est montagneuse, avec des montagnes anciennes, usées, concentrées dans la partie sud de l'île et généralement de direction est-ouest. La «bosse» centrale est déchiquetée et élevée (plus de 1000 m) mais descend en formations graduellement plus douces et plus basses vers les côtes pour se terminer dans les plateaux de l'Ouest et de l'Est, les vastes plaines basses de l'Académie de la Toundra au nord et les plaines moins étendues de la toundra le long du littoral sud. On trouve une diversité de roches métamorphiques, sédimentaires et de type schisteux, avec des roches magmatiques qui indiquent une activité volcanique. Il y a aussi des caractéristiques géologiques diverses, notamment la montagne Toundra de forme conique et façonnée par l'activité volcanique au nord, les pics déchiquetés de la chaîne centrale, les montagnes douces et fortement érodées du massif du Mammouth, les formations de schiste au sud-ouest et le long du fleuve Inattendu, les précipices éboulés, de couleur brun grisâtre de la vallée du fleuve Toundra et les structures de sable rouille, semblables à des fortifications, des pentes septentrionales. La diversité et les nuances multiples de ces caractéristiques dans une zone géographique relativement petite, avec un vaste réseau de vallées et de bassins fluviaux, est une preuve visuelle de la longue histoire géologique de l'île, ininterrompue par la glaciation. Du point de vue esthétique, c'est à la fois inhabituel et impressionnant.

Le réseau hydrographique de l'île Wrangel comprend environ 1400 rivières de plus de 1 km de long; cinq rivières de plus de 50 km de long et quelque 900 lacs peu profonds, essentiellement situés dans la partie nord de l'île et couvrant une superficie totale de 80 km^2. Les eaux de la mer de Sibérie orientale et de la mer des Tchouktches qui entourent les îles Wrangel et Gerald, sont classées dans des régions océanographiques distinctes sur le plan chimique. Ces eaux présentent l'un des taux de salinité les plus faibles du bassin arctique, ont un taux d'oxygénation très élevé et contiennent une plus grande quantité de substances d'origine biologique.

Le terrain n'est pas strié, autre preuve qu'il n'a pas été recouvert par les glaces durant le dernier âge glaciaire du Quaternaire, ce qui confirme donc son caractère unique dans le haut Arctique. Le sol repose sur un socle de permafrost et porte une mosaïque de types de toundra et de steppe coexistant en patchwork. Les types de la toundra sont : des buttes sèches à la végétation clairsemée, arrondies ou pelées (ce qui est indicateur d'un ancien lit océanique), de petites éminences moussues, des prairies abritées aux saules nains mesurant un peu plus de 1 mètre de haut, des pâturages luxuriants, de nombreuses zones humides et marécageuses parsemées de mares, différents complexes dominés par les lichens et des parcelles de désert polaire sec, aux sols plats et compactés et de graviers.

2.3 Climat

L'île Wrangel est influencée par les masses d'air arctique et pacifique et en conséquence, on y constate la prédominance de vents violents. Elle est soumise à des épisodes «cycloniques» caractérisés par des vents circulaires rapides. C'est aussi une île de brumes et de brouillards.

Il semblerait que les températures moyennes soient en train d'augmenter sur l'île Wrangel, que les épisodes climatiques extrêmes soient plus fréquents et que les étés deviennent plus humides. Ces observations concordent avec celles qui ont été faites dans d'autres régions de l'Arctique et indiquent une tendance générale au réchauffement de la région. Sur Wrangel, les conditions climatiques sont extrêmement variables d'un endroit à l'autre mais, par manque d'équipement, le suivi n'a lieu qu'à la seule station météorologique, qui se trouve dans le village d'Ushakovskoe, et ne peut être étendu à d'autres zones de la Réserve.

Il y a des différences notables entre le climat des secteurs nord, centre et sud de l'île. Les secteurs centre et sud sont plus chauds et certaines des vallées présentent un climat semi-continental où l'on trouve plusieurs espèces des prairies subarctiques semblables à la steppe. Il s'agit là d'une caractéristique unique dans le haut Arctique.

Selon les rapports de recherche effectués depuis plusieurs années, les glaces qui entourent l'île Wrangel fondent plus tôt au printemps et l'eau gèle plus tard à l'automne. Le nombre d'années sans glaces a également augmenté chaque décennie. La tendance au réchauffement devrait être source de problèmes pour deux des espèces les plus remarquables de l'île Wrangel – l'ours blanc qui se déplace sur la glace à la recherche de phoques pour se nourrir et le morse qui a besoin de plates-formes de glace pour plonger à la recherche de mollusques, sa nourriture principale. Il faudra intensifier le suivi pour détecter les impacts des changements sur le milieu marin du site.

2.4 Diversité biologique

La diversité des types de terrains offre une gamme d'habitats qui explique, en partie, pourquoi la faune et la flore de l'île Wrangel sont plus diverses que celles de la plupart des autres secteurs de l'Arctique. Les autres raisons tiennent à l'histoire de l'île et à son emplacement. Premièrement, l'île Wrangel est un vestige de l'ancien continent de Béring qui existait au Pléistocène et n'a pas été recouverte par les glaces durant l'âge glaciaire du Quaternaire : elle a servi de refuge aux espèces du Pléistocène et l'on trouve à Wrangel des espèces reliques qui ne sont pas présentes ailleurs. Deuxièmement, l'île Wrangel se trouve au point de rencontre de deux systèmes continentaux majeurs – l'Asie et l'Amérique du Nord – et possède des espèces des deux continents.

L'île Wrangel s'approche d'une région de toundra typique mais sa flore est unique pour la richesse des espèces et le nombre de plantes endémiques. Actuellement, 417 espèces et sous-espèces de plantes vasculaires ont été recensées dans l'île, plus que dans tout l'archipel canadien et le double de tout autre territoire de la toundra arctique de taille comparable. Certaines espèces sont des formes dérivées de formes continentales largement répandues, d'autres sont le résultat d'une hybridation récente et 23 sont endémiques. Cette caractéristique n'a son égal dans aucune autre île de l'Arctique.

La flore dominante comprend les familles de la moutarde, de la rose, de la renoncule et de la saxifrage. Les espèces de plantes à fleurs comprennent la dryade rose *Dryas punctata*, l'anémone pulsatille *Pulsatilla nuttaliana*, *Castilleja elegans*, et les pavots *Papaver* spp. Il y a 17 espèces de pavots arctiques sur l'île Wrangel dont cinq sont endémiques de l'île, notamment *Papaver gorodkovii* et *P. lapponicum*. En outre, on a recensé 331 espèces de mousses et 310 espèces de lichens.

L'île est la destination la plus septentrionale de plus d'une centaine d'espèces d'oiseaux migrateurs et de mammifères marins tant de l'Asie que de l'Amérique du Nord. On y trouve des baleines grises et des dauphins. Les oiseaux sont abondants et comprennent notamment plusieurs oiseaux de rivage (bécasseau variable, bécassine des marais, pluviers bronzé et argenté, bécasseau à poitrine cendrée, bécasseau maubèche, tournepierre à collier), des oies, notamment l'oie des neiges et la bernache cravant, le harfang des neiges, des eiders, les labbes à longue queue et pomarin, les guillemots à miroir, marmette et de Brünnich, le goéland bourgmestre et la mouette tridactyle, la mouette de Sabine, le bruant lapon, le bruant des neiges, la bergeronnette grise, le faucon pèlerin et le faucon gerfaut.

On peut observer facilement, dans toute l'île, des terriers à lemmings. Le lemming à collerette (ou lemming des neiges) et le lemming brun sont tous deux présents et pourraient avoir évolué en sous-espèces distinctes en raison de leur isolement mais ce n'est pas encore confirmé par les études scientifiques. Les lemmings sont la nourriture de base des harfangs des neiges, d'autres rapaces et des renards arctiques. À la différence de leurs cousins continentaux, les lemmings de Wrangel ne connaissent pas de cycles fluctuants de population. Il y a, certes, des déclins et des augmentations cycliques mais ils sont beaucoup moins spectaculaires.

Il est prouvé, par les études paléontologiques, que le bœuf musqué et le renne habitaient l'île à la fin du Pléistocène et peut-être même plus tard, avant de disparaître. Le bœuf musqué a été réintroduit depuis le Canada dans les années 1970 et continue d'être présent sur l'île. Le renne a été introduit à l'île Wrangel dans les années 1940 pour établir un élevage de rennes domestiques. Cette pratique est à l'origine d'un grave surpâturage localisé, de la destruction de sites de nidification et a perturbé l'équilibre écologique. Les opinions divergent quant à savoir si ces deux espèces d'ongulés se trouvent à leur capacité de charge sur l'île ou l'ont dépassée et diverses solutions de maintien d'un équilibre des populations ont été proposées.

Le loup est un prédateur naturel et une petite meute habitait l'île jusqu'à ce que le gouvernement fédéral ordonne sa destruction il y a quelques années pour favoriser l'élevage de rennes aujourd'hui abandonné. Cet équilibre écologique naturel ayant été détruit, l'administration de la Réserve est placée devant plusieurs possibilités: soit réintroduire le loup, soit lui permettre de se réinstaller naturellement (par les glaces qui relient l'île au continent), soit utiliser d'autres moyens d'intervention pour maintenir l'équilibre des grandes populations d'ongulés. Le personnel s'est déclaré préoccupé par la réaction négative que pourrait susciter la réintroduction du loup étant donné que cet animal est généralement craint malgré son rôle écologique important et sa grande utilité.

3. COMPARAISON AVEC D'AUTRES SITES

Udvardy (1975) a classé le complexe de l'île Wrangel dans le domaine de la Toundra du haut Arctique du Paléarctique oriental. Il n'y a pas d'autres biens naturels du patrimoine mondial de la Toundra du haut Arctique actuellement. En fait, sur la Liste actuelle du patrimoine mondial, la toundra et le système polaire sont les biomes les moins communs.

Il est donc nécessaire de comparer ce site à d'autres aires protégées de la région arctique. Pour les besoins de la présente analyse, c'est la définition de l'Arctique acceptée par le Conseil de l'Arctique et par l'UICN dans sa Stratégie pour l'Arctique qui a été appliquée. Elle divise l'Arctique en quatre grandes zones: milieu marin; désert arctique; toundra et forêt de transition à la limite des arbres ou zone de «forêt-toundra», bien qu'il y ait des différences, selon les spécialistes, dans la délimitation de chaque zone. Au total, la région arctique couvre près de 30 millions de km^2 et contient plus de 400 aires protégées, mais la présente analyse est limitée à une comparaison avec 12 autres îles et complexes insulaires arctiques dans la zone marine qui couvre elle-même près de 15 million de km^2.

Sur les 13 îles arctiques étudiées, 11 jouissent d'une protection officielle et il y a environ 30 aires protégées. Certaines îles, comme Wrangel, l'archipel de la Nouvelle-Sibérie et la Terre François-Joseph sont protégées à plus de 95% (dans la Catégorie de gestion I de l'UICN). D'autres, comme Severnya Zemlya ou Novya Zemlya n'ont pas d'aires protégées. De toutes les îles et de toutes les aires protégées, c'est Wrangel qui présente la plus haute biodiversité et la plus forte productivité, terrestres et marines. Cette affirmation est explicitée ci-après.

Biodiversité marine: il n'y a pas assez de données disponibles pour comparer le taux de productivité marine et de biomasse zooplanctonique de Wrangel et des autres îles de l'Arctique. Toutefois, d'après d'autres paramètres, tels que le nombre élevé d'espèces dépendant du milieu marin, il est logique de conclure qu'à part l'Islande et les îles Aléoutiennes, la productivité et la biomasse marines de Wrangel dépassent celles de toutes les autres îles de l'Arctique à l'exception possible de certaines zones côtières du Groenland. Il n'y a toutefois pas suffisamment de données ni de travaux de recherche sur le milieu benthique des îles Arctique pour procéder à une analyse comparative.

Pour les îles de l'Arctique, six espèces marines ont été étudiées: l'omble chevalier, le phoque barbu, le narval, le morse du Pacifique, la baleine grise et l'ours blanc. Sur les six, cinq sont présentes sur l'île Wrangel, le nombre le plus élevé, toutes îles confondues. Les ours blancs se reproduisent sur dix îles et Wrangel et Svalbard en accueillent la plus forte densité. Toutefois, Wrangel possède un nombre de tanières beaucoup plus élevé que Svalbard. Les sites de reproduction sont intégralement protégés dans des aires protégées

sur Wrangel et certaines parties de Svalbard, mais ils ne le sont pas sur Novya Zemlya ni sur certaines îles canadiennes. Le morse du Pacifique est présent sur six îles arctiques mais les plus grandes colonies se trouvent à Wrangel où elles sont intégralement protégées. Elles sont aussi protégées sur Svalbard, dans l'archipel de la Nouvelle-Sibérie et sur la Terre François-Joseph mais pas à Novya Zemlya ni à Severnya Zemlya.

***Biodiversité terrestre**:* les terres de l'Arctique sont classées selon les zones de végétation et plusieurs systèmes sont utilisés. On note une corrélation étroite entre la classification zonale de la végétation et la productivité. Dans les divers systèmes, seules l'Islande et les Aléoutiennes présentent une productivité primaire plus élevée que Wrangel, car elles se trouvent dans des zones plus productives. Du point de vue de la végétation, Wrangel est classée, soit exclusivement comme une toundra arctique, variante méridionale (une anomalie parmi les îles de l'Arctique), soit entièrement comme un désert arctique avec plus de 5% de biomasse. Seul l'archipel de la Nouvelle-Sibérie entre dans cette dernière catégorie mais ses îles ne sont pas protégées. Cette classification distingue Wrangel des îles arctiques canadiennes qui sont classées désert arctique mais avec moins de 5% de biomasse.

Des études ont été réalisées sur les plantes vasculaires endémiques rares de l'Arctique que l'on ne trouve que sur six îles. Ces plantes rares sont présentes en plus forte densité par rapport à la taille sur Wrangel. Deux îles – Wrangel et les Aléoutiennes – ont des espèces que l'on ne trouve que là. Il y a 21 espèces exclusivement présentes sur l'île Wrangel tandis qu'il n'y en a que quatre exclusivement présentes dans les Aléoutiennes. Toutes les espèces de plantes vasculaires endémiques et rares de Wrangel sont intégralement protégées dans une réserve naturelle intégrale de Catégorie I. Des plantes rares sont aussi protégées aux Aléoutiennes dans une aire protégée de Catégorie IV. Toutefois, les plantes endémiques rares que l'on trouve sur d'autres îles arctiques, notamment à Svalbard, au Groenland et dans l'île d'Ellesmere se trouvent essentiellement en dehors des aires protégées.

Onze espèces de la faune terrestre ayant une vaste distribution arctique ont été étudiées afin de connaître leur présence sur les îles de l'Arctique. Il s'agit des eiders commun, à tête grise et de Steller, des guillemots de Brünnich et marmette, des lemmings à collerette et brun, de l'oie des neiges, du renne de la toundra, du bœuf musqué et du loup. Sur les 11 espèces terrestres de la faune étudiées, 10 se trouvent sur l'île Wrangel, chiffre le plus élevé pour toute île ou archipel de l'Arctique. À Wrangel, seul l'eider à tête grise est absent. Wrangel est aussi la seule île où l'on trouve à la fois le lemming à collerette (*Groenlandicus*) et le lemming brun. Toutes les autres îles ont soit l'une soit l'autre espèce de lemming mais pas les deux. Wrangel est enfin la seule île de l'Arctique qui possède une population asiatique de l'oie des neiges.

4. INTÉGRITÉ

4.1 Limites

Comme mentionné plus haut, le site proposé pour inscription sur la Liste du patrimoine mondial comprend un élément marin, est placé sous l'égide de la juridiction fédérale bien qu'il y ait un accord de «partage de travail» avec la République autonome des Tchouktches. Le village d'Ushakovskoe (avec deux familles résidentes, plusieurs gardes et les huit membres du personnel de la base polaire), une partie des terres environnantes et la zone marine qui se trouve entre le fleuve Khistchnikov et le cap Hawaï sont en dehors des limites du site et de la Réserve proposés et ne sont pas soumis à des dispositions strictes, y compris sur l'accès. Toutefois, l'entrée est soumise à un système de permis et contrôlée par des gardes résidents.

4.2 Statut juridique

Le site proposé est un bien fédéral placé sous la responsabilité du ministère des Ressources naturelles. Dans le système russe des aires protégées, le site proposé, avec son élément terrestre et son élément marin, est classé «zapovednik» (Catégorie Ia de l'UICN, Réserve naturelle intégrale). Il s'agit du plus haut niveau de protection qui exclut pratiquement toute

activité humaine sauf à des fins scientifiques. La zapovednik a été établie en 1976 sous le nom de Sanctuaire d'État de l'île Wrangel par le Département d'État de la planification de l'URSS. À l'époque, tous les bâtiments, structures et troupeaux de rennes ont été exclus de la zapovednik par le ministère de l'Agriculture. Afin d'assurer une meilleure protection aux mammifères marins et par suite d'une proposition conjointe du gouverneur de la République autonome des Tchouktches et du Comité d'État pour l'environnement, la Réserve a été étendue à la mer territoriale (jusqu'à la limite des 12 milles nautiques) en 1997, par décret fédéral. En 1999, le gouvernement de la République autonome des Tchouktches a recommandé une nouvelle extension de l'élément marin de la Réserve jusqu'à 24 milles nautiques mais cette proposition n'a pas été acceptée au niveau fédéral.

4.3 Gestion

En juillet 1997, le Comité d'État pour la protection de l'environnement du gouvernement de la Fédération de Russie a signé un accord sur les aires protégées avec l'administration de la République autonome des Tchouktches. Cet accord a délégué une bonne partie de l'autorité administrative sur les aires protégées (y compris la Réserve naturelle d'État de Wrangel) à l'Administration de la République autonome des Tchouktches. Selon cet accord, celle-ci est responsable du fonctionnement quotidien du site proposé, de l'administration du territoire n'entrant pas dans la Réserve, participe au choix du directeur de la Réserve, est responsable du milieu marin et de l'application des règlements en milieu marin.

Bien que la zapovednik (ou réserve) dispose de plans de travail annuels, il n'y a pas de plan de gestion complet pour le site ce qui, en Russie, n'est pas une chose rare pour une réserve. En fait, le plan de gestion est un concept relativement nouveau dans le pays, un concept qui trouver sa place. Certains outils de gestion sont en place. En 1992, les autorités de la Réserve ont publié un «code de conduite» concernant le déversement de déchets, avec des interdictions et des lignes directrices sur la protection de l'ours blanc, du morse, du renard arctique, des lemmings, de l'oie des neiges, du harfang des neiges et d'autres oiseaux de la toundra. Il n'y a pas d'orientations concernant la protection de la flore, des formations géologiques ou des valeurs culturelles. En 1997, les autorités fédérales ont approuvé un ensemble de dispositions pour la Réserve qui décrivent ses fonctions et le rôle et les responsabilités du personnel et des scientifiques. Il y a des règlements stricts concernant la zone marine où la navigation, par exemple, n'est pas autorisée.

Les personnes qui travaillent dans le site proposé sont employées par le gouvernement fédéral. L'équipe d'encadrement se compose du directeur de la Réserve nommé par le ministère des Ressources naturelles et du conseiller scientifique en chef nommé par le directeur. Il y a environ 27 employés à plein temps ou temps partiel, soit un groupe de huit scientifiques travaillant à plein temps à l'étude du harfang des neiges, des lemmings, de l'oie des neiges, des ongulés, de l'ours blanc et du morse, à la science vétérinaire et à l'archéologie, sept techniciens, quatre gardiens et huit employés administratifs. Les gardiens résident à plein temps sur l'île Wrangel et mènent à bien différentes tâches, notamment la surveillance et l'entretien du site et surveillent également les établissements permanents de l'île. Le personnel scientifique est secondé par plusieurs experts de Moscou et de Saint-Pétersbourg qui mènent des travaux de recherche sur l'hydrologie, la météorologie, la géologie, la botanique, la paléontologie et les mammifères marins. La Réserve attire également des étudiants universitaires et des expéditions scientifiques, de temps en temps. Il n'y a pas de plan pour les ressources humaines du site.

La Réserve dispose de rares véhicules qui sont souvent en mauvais état. Le personnel n'a pas d'outils pour les réparations ni de pièces de rechange, y compris de pneus, dignes de ce nom. Les pannes de véhicule et de communications sont un problème constant et sont préoccupantes pour la sécurité du site. La Réserve n'a pas non plus d'équipement de communication technique adéquat. Les communications sur l'île ainsi qu'entre l'île et le continent sont limitées et se font par signal radio lorsque les conditions le permettent. Il y a également un grave problème de gestion des communications avec le siège de la Réserve qui se trouve à Moscou. La Réserve n'est pas seulement isolée du point de vue physique mais elle aussi très isolée des autorités fédérales. Cette situation est source d'autres problèmes de gestion et de coordination.

La Réserve dépend du pétrole et de générateurs pour toute son énergie, ce qui est très coûteux, bruyant et polluant pour l'atmosphère sans compter que les approvisionnements ne sont pas toujours garantis. Le personnel de la Réserve estime que des cellules d'énergie solaire et l'énergie éolienne seraient de bonnes solutions mais il n'y a pas suffisamment d'argent pour les mettre en œuvre.

Le tourisme se fait surtout par bateau de croisière et il est soumis à des autorisations ainsi qu'à des règlements stricts et répond à des critères d'accès. Les navires s'amarrent à l'île et débarquent des passagers qui se promènent le long des rives, à l'extérieur de la Réserve, sans entrer dans la Réserve elle-même. Le tourisme dans la Réserve est sévèrement contrôlé et prend la forme d'expéditions scientifiques guidées par le personnel. C'est une source de revenu et un moyen de promouvoir les valeurs de la Réserve. L'équipement est primitif et si l'île devait être davantage ouverte au tourisme, il faudrait l'améliorer en évitant soigneusement de perturber la faune sauvage qui est particulièrement vulnérable au bruit et aux activités humaines.

4.4 Recherche et suivi

Le conseiller scientifique en chef est globalement responsable pour les programmes de recherche et de suivi de la Réserve. Comme c'est le cas pour d'autres réserves naturelles de Russie, la recherche est une priorité sur l'île Wrangel et il y a actuellement trois programmes de recherche en cours qui concernent des espèces auxquelles l'île fournit un habitat unique: le harfang des neiges, l'ours blanc et l'oie des neiges. Pour ces espèces, on dispose de longues séries temporelles de données. Les travaux menés sur les autres espèces et sur les facteurs de l'environnement sont ponctuels et dépendent énormément des experts de passage et de leur intérêt. Par exemple, il n'y a pas de recherche benthique en cours ni de plans prévoyant une telle recherche et il n'y a pas eu de recherche ou de suivi sur la végétation depuis deux saisons. Une des raisons est que le financement est très limité et que la priorité est donnée au fonctionnement de la Réserve plutôt qu'à l'investissement dans de nouveaux travaux de recherche.

La Réserve pourrait servir de « girouette » importante pour le suivi des changements climatiques et pour détecter les changements environnementaux et les adaptations. Toutefois, le climat ne fait pas l'objet d'un suivi permanent, en partie, parce qu'il n'y a pas d'équipement de veille du climat automatisé. Il n'y a pas actuellement de plans de suivi à long terme et il est impératif d'améliorer la recherche et le suivi dans la Réserve, de faire en sorte qu'ils soient plus complets et plus à jour et maintenus à un niveau de haute qualité. L'absence de plans de recherche et de suivi exhaustifs contribue à affaiblir le programme de gestion de la Réserve. Le programme de suivi devrait également être mieux lié à d'autres programmes arctiques tels que le Programme de suivi circumpolaire du caribou et du renne et le Suivi des mammifères marins migrateurs d'Amérique du Nord.

4.5 Menaces et impacts anthropiques

Selon le personnel de la Réserve et les autorités fédérales à Moscou, la base polaire et village d'Ushakovskoe avec sa zone tampon environnante qui ne fait pas partie de la Réserve mais se trouve juste à l'extérieur de celle-ci pose les plus grandes menaces immédiates. On a déjà pu constater des dommages et le risque de voir les écosystèmes et la faune sauvage de l'île gravement perturbés est très réel. Par exemple, le personnel de la base polaire est présent en rotation et n'est pas toujours sensible, dans son comportement, à la vulnérabilité de l'île. Les gardes de la Réserve passent actuellement beaucoup de leur temps à observer ce qui se passe à Ushakovskoe afin d'atténuer les dommages causés à l'environnement. Il est prévu de fermer la base polaire et de déplacer, en dehors de l'île, les résidents qui ne se trouvent pas dans la Réserve.

Le plus difficile est d'appliquer les règlements car la Réserve ne dispose pas de bateaux de patrouille et les capacités d'application de l'administration de la République autonome des Tchouktches sont limitées, de sorte que la chasse illicite et le braconnage restent une grave menace. Parmi les autres menaces existantes ou potentielles pour la Réserve, il y a les activités qui ont lieu dans la partie continentale de la République autonome des Tchouktches

telles que les fuites de carburant des brise-glaces et des chalutiers, le tourisme, le développement industriel sur le continent et la pollution qui en résulte, notamment par la combustion du charbon, l'absence chronique de ressources financières, l'absence d'équipement de communication et d'équipement technique adéquats et les systèmes de gestion et de planification défaillants.

En juin 1994, la Russie et les États-Unis ont signé un Mémorandum d'accord relatif à la vente conjointe de concessions de pétrole et de gaz dans la mer des Tchouktches. La zone concernée se trouve à peu de distance de l'île Wrangel et de l'île Gerald. Selon les autorités fédérales, l'accord et la vente proposés ont été annulés. Toutefois, cette situation pourrait changer si la Russie amende sa politique sur la prospection et l'exploitation gazières et pétrolières. En conséquence, si le forage était un jour autorisé dans la mer des Tchoukches, il devrait être soumis à des règlements extrêmement contraignants pour protéger la Réserve et les voies de migration de la faune sauvage.

Actuellement, les impacts anthropiques dans la Réserve sont minimes. Les plus graves se sont produits pendant la période d'établissement avant la mise en place de la Réserve, en 1976. Les signes en sont encore visibles et le resteront étant donné le climat. À cette époque, on a utilisé des véhicules tout-terrain de manière non discriminée et les pistes qu'ils ont tracées, ainsi que quelques véhicules abandonnés, sont encore présents dans certaines zones de la toundra. La politique consiste aujourd'hui à utiliser les pistes existantes et à ne pas en faire de nouvelles. La présence autrefois de quelque 100 résidents au village de Doubtful et sur la piste aérienne voisine a eu beaucoup d'effets perturbateurs sur la faune sauvage et le terrain, notamment par le bruit, la pollution, les véhicules motorisés et les pressions de la chasse. Les morses ont disparu de leur colonie traditionnelle sur la langue de Doubtful, lorsque le village était habité, mais ont récemment commencé à revenir et 70 000 morses utilisent aujourd'hui le site.

Parmi les autres impacts, on note les débris, notamment les bidons d'essence jetés après avoir servi à importer la principale source d'énergie de l'île. La plupart ont aujourd'hui été ramassés dans la toundra, dans le cadre d'un programme de nettoyage permanent, et empilés près des stations de recherche en attendant d'être éliminés. La politique actuelle consiste à éliminer un bidon chaque fois qu'on en importe un. Il y a quelques débris peu esthétiques et du matériel de construction abandonné autour de Doubtful et de la piste aérienne mais cela ne pose pas de vrais problèmes. La Réserve étudie les moyens de nettoyer la région tout en préservant le site déserté pour ses valeurs culturelles.

De loin, l'impact anthropique le plus grave et le plus insidieux est l'élevage de rennes qui a causé des dommages très graves à la végétation et aux zones de nidification, en particulier de l'oie des neiges, qui revient lentement maintenant que l'élevage est fermé. Les cabanes désertées par les éleveurs de rennes servent aujourd'hui de stations de recherche et d'étape pour le personnel de la Réserve et les expéditions.

Un afflux de personnes trop nombreuses dans l'île ou l'ouverture de l'île à des activités telles que la chasse pour obtenir des ressources additionnelles seraient des menaces potentielles pour le site. La faune vulnérable est déjà à la limite extrême de son aire de répartition et succomberait à des armes puissantes, à une utilisation non discriminée de véhicules tout-terrain ou au bruit perturbateur qui accompagne la plupart des activités anthropiques.

5. AUTRES COMMENTAIRES

Le site proposé a des valeurs paléontologiques importantes. L'île Wrangel a été le refuge des derniers mammouths et, selon le personnel, des défenses et des crânes sont régulièrement apportés par les rivières. Le personnel indique également avoir trouvé des traces du bison primitif, du cheval de Prjevalski, du rhinocéros laineux et d'autres espèces. Selon le personnel, il existe des traces paléontologiques d'un grand lac qui aurait été présent il y a plus de 100 000 ans près de la montagne Toundra, ce qui expliquerait l'abondance actuelle des oies des neiges dans la région. Des ossements laissés par d'anciens chasseurs

inuit il y a environ 2400 ans peuvent encore être observés sur l'île ainsi que des ossements ordonnés en motifs particuliers par les chasseurs indigènes au début de ce siècle.

Il importe aussi de noter les valeurs culturelles associées au site. Celles-ci comprennent un site paléo-inuit, plusieurs petits établissements désertés d'éleveurs de rennes avec leurs artéfacts intacts ainsi que le village et la piste aérienne désertés de Doubtful où de nombreuses maisons et bâtiments sont préservés avec les objets qui ont appartenu aux anciens habitants, y compris des lettres, des livres et autres objets. Ils racontent une histoire intéressante sur les habitants eux-mêmes et les efforts qu'ils ont déployés pour s'installer dans un milieu isolé et très hostile. Autre aspect intéressant de l'histoire culturelle de l'île, elle a servi de refuge aux survivants de la grande expédition arctique canadienne de 1914 et a été témoin du voyage éprouvant de son chef, Robert Bartlett, parti chercher un navire de sauvetage – le *King and Winge*.

6. APPLICATION DES CRITÈRES DU PATRIMOINE MONDIAL

Le Système naturel d e la Réserve de l'île Wrangel est proposé au titre des critères naturels (ii) et (iv).

Critère (ii): processus écologiques

Le site proposé est un écosystème insulaire autonome et il est clair qu'il a subi un long processus d'évolution ininterrompu par la glaciation qui a recouvert la majeure partie de l'Arctique durant le Quaternaire. Le nombre et le type d'espèces de plantes endémiques, la diversité des communautés de plantes, la succession rapide et les mosaïques de types de la toundra, la présence de défenses et de crânes relativement récents de mammouths, la gamme des types de terrains et des formations géologiques sur un petit espace géographique sont autant de témoins de l'histoire naturelle riche de Wrangel et de sa place unique dans l'évolution de l'Arctique. En outre, le processus se poursuit comme on peut l'observer, par exemple, avec les densités exceptionnellement élevées et les comportements particuliers des populations de lemmings de Wrangel par rapport aux autres populations arctiques ou dans les adaptations physiques des rennes de Wrangel qui pourraient désormais faire partie d'une population distincte de celles du continent. Les stratégies d'interaction entre les espèces sont extrêmement au point et visibles dans toute l'île, en particulier près des nids des harfangs des neiges qui font office de protectorat pour d'autres espèces et de balises pour les espèces migratrices et, autour des tanières des renards. L'UICN considère que le site proposé remplit ce critère.

Critère (iv): diversité biologique et espèces menacées

Le site proposé jouit du plus haut niveau de biodiversité dans le haut Arctique. L'île Wrangel est l'habitat de nidification de la seule population asiatique de l'oie des neiges qui est en train de lentement se reconstituer à partir de niveaux catastrophiquement bas. Le milieu marin est un site de nourrissage de plus en plus important pour la baleine grise qui migre depuis le Mexique (certaines depuis un autre bien du patrimoine mondial, le Sanctuaire de baleines d'El Vizcaino). Les îles abritent les plus grandes colonies d'oiseaux marins de la mer des Tchoukches, sont les sites de nidification les plus septentrionaux pour plus de 100 espèces d'oiseaux migrateurs, dont plusieurs sont en danger comme le faucon pèlerin, possèdent d'importantes populations d'espèces d'oiseaux résidents de la toundra, mêlées à des espèces migratrices de l'Arctique et d'ailleurs et présentent la plus haute densité de tanières ancestrales de l'ours blanc. L'île Wrangel s'enorgueillit de posséder la plus grande population de morses du Pacifique avec quelque 100 000 animaux qui se rassemblent en tout temps, dans l'une des importantes colonies côtières de l'île. Étant donné que l'île Wrangel contient une haute diversité d'habitats et de climats et que les conditions varient considérablement d'un endroit à l'autre, il n'y a pratiquement jamais eu d'échec total de la reproduction d'une espèce. Compte tenu de la taille relativement petite de la région, c'est extrêmement peu habituel dans le haut Arctique. L'UICN considère que le site proposé remplit ce critère.

7. RECOMMANDATIONS

L'UICN recommande au Comité **d'inscrire** le Système naturel de la Réserve de l'île Wrangel sur la Liste du patrimoine mondial au titre des critères (ii) et (iv).

Le Comité pourrait recommander à l'État partie, de toute urgence de préparer un plan de gestion et une stratégie de mise en œuvre avec des ressources financières suffisantes pour intégrer entre autres: les communications techniques et de gestion; une stratégie pour le tourisme et les visiteurs; des solutions de rechange pour l'énergie utilisée; le transport; un programme de suivi et de recherche; des possibilités de préserver les caractéristiques culturelles et paléontologiques du site; une politique pour les ressources humaines en ce qui concerne le personnel qui travaille sur le site; et un plan d'élimination des débris indésirables au village de Doubtful. Le Comité pourrait aussi encourager l'État partie à soumettre, s'il le souhaite, une demande d'aide technique internationale afin d'entreprendre les mesures proposées ci-dessus. Le Comité est également prié de demander aux autorités russes d'inviter une mission dans deux à trois ans pour faire rapport sur l'état du plan de gestion et examiner sa mise en œuvre.

Enfin, le Comité pourrait encourager l'État partie à envisager d'agrandir l'élément marin du site de 12 milles nautiques supplémentaires, comme proposé en 1999 par le gouvernement de la République autonome des Tchoukches. Cette extension renforcerait considérablement la protection de la diversité biologique marine de la Réserve de l'île Wrangel.