

## WHC Nomination Documentation

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SITE NAME ("TITLE") East Rennel

DATE OF INSCRIPTION ("SUBJECT") 5 / 12 / 1998

STATE PARTY ("AUTHOR") SOLOMON ISLANDS

CRITERIA ("KEY WORDS") N (ii)

### DECISION OF THE WORLD HERITAGE COMMITTEE:

#### 22nd Session

East Rennell is part of Rennell Island, the southernmost of the Solomon Islands group. Rennell, the largest raised coral atoll in the world, is 86 km long and 15 km wide and covers an area of 87,500ha. A major feature is Lake Tegano, which was the former lagoon on the atoll and is the largest lake in the insular Pacific (15,500ha). Rennell is mostly covered with dense forest with a canopy averaging 20m in height. East Rennell is of outstanding universal value under natural criterion (ii), demonstrating significant on-going ecological and biological processes and is an important site for the science of island bio-geography. These processes relate to the role of East Rennell as a stepping-stone in the migration and evolution of species in the western Pacific and for speciation processes underway, especially with respect to the avifauna. Combined with the strong climatic effects of frequent cyclones, the site is a true natural laboratory for scientific study. [.....]

The Committee had a considerable debate on customary protection and agreed that customary management should be supported. It pointed out that while traditional protection and management mechanisms are provided for in the Operational Guidelines for cultural sites (par. 24 b(ii)), no similar provision exists for natural sites (par. 44 b (vi)) and that this item would be discussed under the agenda item "Operational Guidelines". A number of delegates welcomed the nomination and noted that a site protected by customary law is breaking new ground, and that the inclusion of this type of property is in line with the Global Strategy. Sites from other States Parties, which are under traditional management and customary law, may provide examples for general principles.

The Delegate of Thailand stated that although he had no doubt about the World Heritage values of the site, he could not support the nomination at this stage, as it did not comply with the requirements of the Operational Guidelines. He noted that customary land tenure does not automatically guarantee effective customary management and that there are no legislative provisions to protect the site from rapid changes such as tourism, which may affect it. He therefore dissociated himself from the Committee's decision.

The Committee inscribed the site under natural criterion (ii). The Committee recommended that the State Party should proceed with the preparation of the Resource Management Plan and the draft national World Heritage Protection Bill and that a mission be undertaken in three years time to assess progress made.

The Observer of the Solomon Islands thanked the Committee and stated that his office is constantly working on the conservation of the site and that customary protection often hinders development. He noted that a number of NGOs, including WWF, The Nature Conservancy and Greenpeace are working in the Solomon Islands to enhance environmental awareness and sustainable development. His Government finalized the Environmental Conservation Bill, which is a milestone in the conservation and shows the commitment to heritage protection. The Chairperson congratulated the Solomon Islands for the inscription of their first site on the World Heritage List.

### BRIEF DESCRIPTION:

East Rennell makes up the southern third of Rennell Island, the southernmost island in the Solomon Island group in the western Pacific. Rennell, 86 km long and 15 km wide, is the largest raised coral atoll in the world. The site covers approximately 37,000 hectares plus a marine area extending three nautical miles to sea. A major feature of the island is Lake Tegano which was the former lagoon on the atoll. The lake, the largest in the insular Pacific (15,500 hectares), is brackish and contains many rugged limestone islands and endemic species. Rennell is mostly covered with dense forest with a canopy averaging 20 m in height. Combined with strong climatic effects of frequent cyclones, the site is a true natural laboratory for scientific study. The site is under customary land ownership and management.

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1.b. State, province or region: Rennel is the southernmost island in the Solomons and is in the Rennel and Bellona Province.

1.d Exact location: North boundary; 160°20'34" E – 11°39'52" S / South boundary; 160°18'15"E – 11°43'06" S



Nomination of  
**EAST RENNELL, SOLOMON ISLANDS**  
for Inclusion in the  
**WORLD HERITAGE LIST - NATURAL SITES**





Nomination of

# **EAST RENNELL, SOLOMON ISLANDS**

by the

**GOVERNMENT OF THE SOLOMON ISLANDS**

for Inclusion in the

**WORLD HERITAGE LIST  
NATURAL SITES**

June 1997

## **ACKNOWLEDGEMENTS**

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for the

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Ministry of Foreign Affairs and Trade**

with support from

**THE MINISTRY OF CULTURE, TOURISM AND AVIATION**

P.O. Box G. 20  
Honiara  
SOLOMON ISLANDS

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### **COVER PHOTOGRAPH**

View from the former reef crest showing the coast at Tuhugago Bay and Lake Tegano. Photographer = Paddy Ryan for World Heritage.



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## INTRODUCTION

This nomination document is to support the recommendation made in 1989 by the Solomon Island Government that World Heritage listing be pursued for Lake Tegano on East Rennell in Rennell and Bellona Province and for Marovo Lagoon in the Western Province. The New Zealand Government was invited to be the sponsor country to enable the Solomon Islands to become a State Party to the World Heritage Convention and to assist with the procedures for listing. In 1992 the Solomon Islands became a member of the Convention.

The New Zealand Government has provided seven consultancies since 1989 under the Official Development Assistance Programme. In 1994, the New Zealand Ministry of Foreign Affairs appointed a Project Manager to be resident in the Solomon Islands to continue to provide public awareness about the World Heritage Programme and to assist the Solomon Island Government, the Provincial Government and the local people in meeting the requirements for listing and to prepare the nomination document. Progress has been slow because there have been a number of people involved in the project for short intervals.

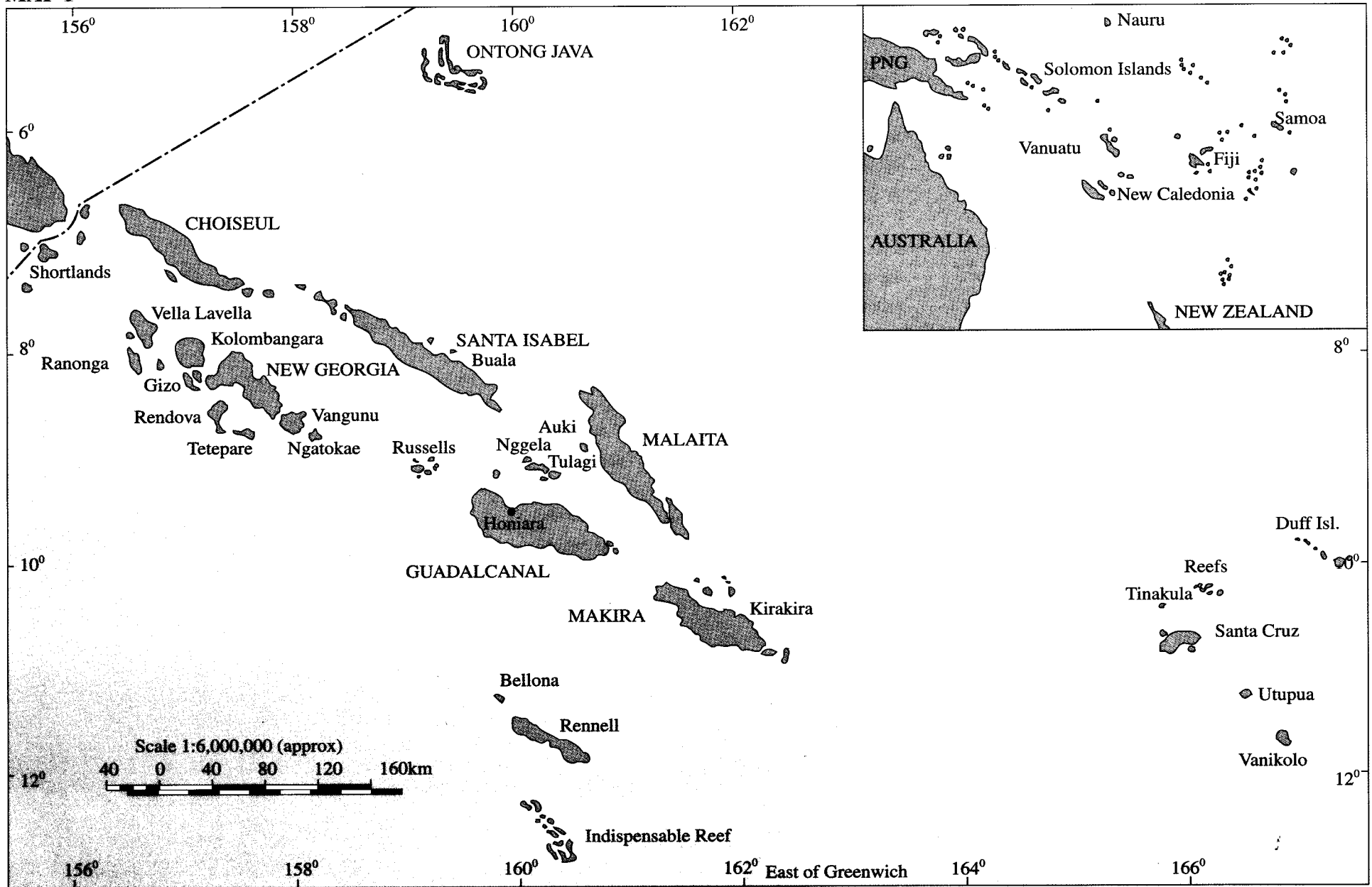
East Rennell is an area that includes reef and sea, land, forests and Lake Tegano. There are four villages beside the lake and one road into the area. The area is largely undisturbed by human impact. The island of Rennell is a forest covered, coral atoll distant from other islands in the Solomons group.

The proposed World Heritage area at East Rennell is not Government land but all land, marine reefs and Lake Tegano are under custom ownership. The local people, numbering around 500 are Polynesian and live within the proposed World Heritage area. The people lead a largely subsistence life style with garden produce from shifting cultivation, lake and sea fish and they occasionally hunt for birds and bats. The site is in a very natural state with the most significant environmental change being the construction and opening of a road from Lavagu Bay to the western end of the lake in 1995.

The isolation of East Rennell has been a major protecting factor. However, now that there is a road to the lake, the local people are keen to encourage small scale ecotourism as a means of earning some income and maintaining their environment. They are also looking at other small businesses such as honey production and marketing of traditional weaving and carving that is sustainable and is compatible with World Heritage principles.

It is submitted that the area of East Rennell, Solomon Islands has outstanding universal values and meets all four criteria for inclusion as a World Heritage natural property.

MAP 1



The Solomon Islands and their location in the Pacific.



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## **1. SPECIFIC LOCATION**

### **1.1 Country**

Solomon Islands

### **1.2 Province**

Rennell is the southernmost island in the Solomons and is in the Rennell and Bellona Province (see Map 1).

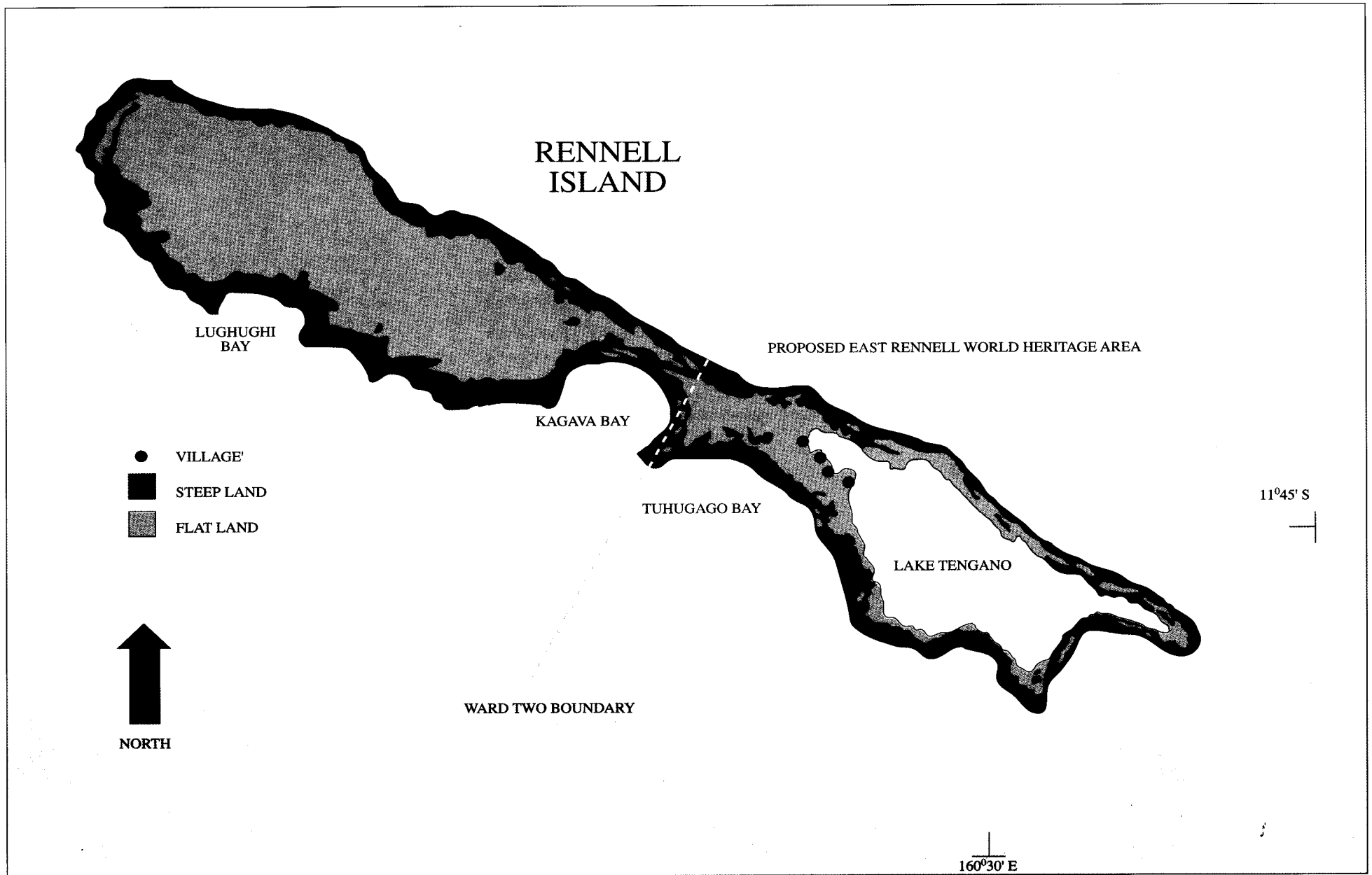
### **1.3 Name of Property**

The nominated area is known as the East Rennell Area and, if inscribed, it would be known as the “East Rennell World Heritage Area”. It includes the land from the south-eastern tip of Rennell and Lake Tegano to the provincial boundary between wards two and three. It also includes the reefs to the south of this boundary and extends three nautical miles out to sea.

### **1.4 Exact Location on Map, Geographical Coordinates and Area.**

The nominated area is on Rennell which is an island approximately 180 kilometres to the south of Guadalcanal and to the southwest of San Cristobal. These are the closest large islands of the Solomons group. The coordinates where the ward boundary meets the coast to the north are :160° 20' 34" E and 11° 39' 52" S. The coordinates where the ward boundary meets the coast to the south are : 160° 18' 15" E and 11° 43' 06" S (see Map 2). East Rennell has an area of 370 km<sup>2</sup> and includes Lake Tegano which has an area of 155 km<sup>2</sup>.

MAP 2



Rennell Island showing the proposed East Rennell World Heritage Area which includes Lake Tegano, the land and the sea out to three nautical miles.

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## **2. JURIDICIAL DATA**

### **2.1 Ownership**

The land, islands and marine reefs at East Rennell are all custom owned while Lake Tegano is regarded as property common to the people from the four lakeside villages. The custom land and reef ownership system involves rights of resource use by family groups in specified areas. Custom ownership is patrilineal. All major decisions on land ownership are decided by the Chiefs. Resource owners can allow resource users to garden or harvest resources from the resource owners' land.

East Rennell has a Paramount Chief and Council of Chiefs. The Chiefs are nominated to the council by their clans and they serve in the council for an unspecified time. The position of Paramount Chief is hereditary.

### **2.2 Legal Status**

Information on Acts that have relevance to the nomination area is covered in appendix E. There is currently no adequate legislation that protects the natural and cultural features of East Rennell. At present customary practices provide protection to the area.

### **2.3 Responsible Administration**

The Ministry of Culture, Tourism and Aviation will be the administering authority at a national level with assistance from the Ministry of Forests, Environment and Conservation on resource management issues. The Rennell and Bellona Provincial Government will

provide administration at Provincial level and at a local level, administration will be done through consultation with the Paramount Chief and Council of Chiefs. At East Rennell the customary / traditional practices have provided protection in the past and these practices will be recognised and strengthened.

The World Heritage Project Management Committee meets in Honiara approximately three times a year and considers the policy and national issues involved. It has representatives from the Solomon Island and New Zealand Governments and a representative from each of the two proposed World Heritage sites. World Heritage Programme employees from both governments report to this committee and they liaise with the Provincial Governments and with the Paramount Chief and village Chiefs. Increasingly, the World Heritage employees will be working with, and supporting local committees.

The role of the Provincial Governments within the Solomon Islands is unresolved at this time because the Provincial Government Act was repealed by the National Government in 1996. This is currently under appeal as it may have been unconstitutional. The new system was intended to devolve more power to Area Councils and local management.

At East Rennell, the Paramount Chief has power to decide on resource use within the area and has disallowed some extractive businesses that were intending to harvest natural resources. The Paramount Chief consults the Council of Chiefs and considers matters raised by resource owners directly or through the Tegano Management and Conservation Committee. This committee considers small business and resource use applications to verify customary rights and if they are sustainable. The committee, along with other resource owners and members of the Provincial Government, will be involved in the development and implementation of the East Rennell Resource Management Plan.

Ministry of Culture, Tourism and Aviation,  
P.O. Box G. 20, Honiara.

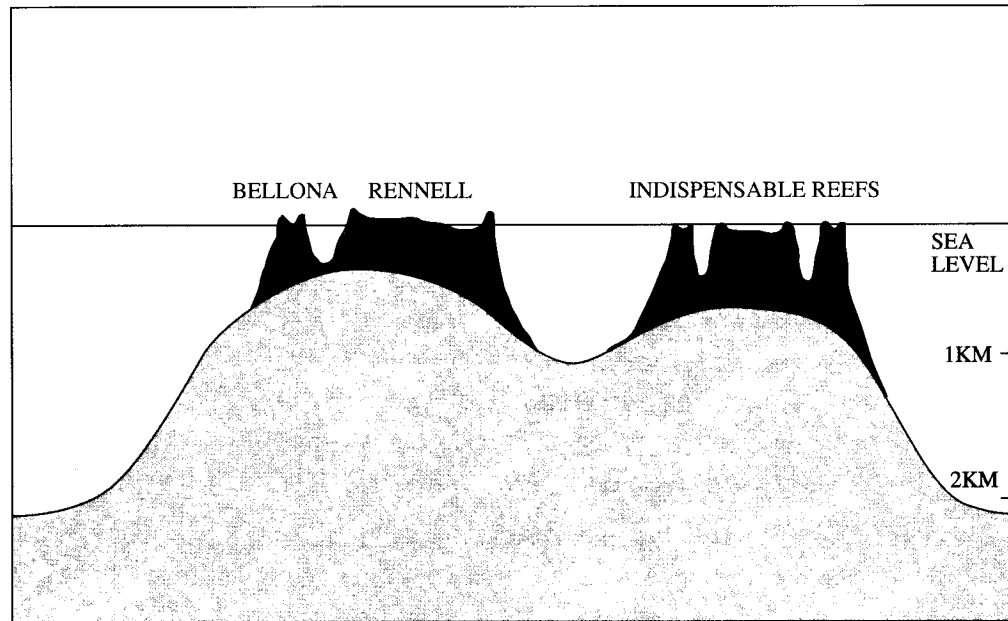
Rennell and Bellona Province,  
P.O. Box G 35, Honiara.

Paramount Chief of East Rennell,  
C/o Tigoa, West Rennell,  
Rennell and Bellona Province.

Tegano Management and Conservation Committee,  
Niupani Village, East Rennell,  
C/o Tigoa, West Rennell,  
Rennell and Bellona Province.



**FIGURE 3**



*Schematic cross section of Rennell, Bellona and the Indispensable Reefs. This diagram (from Grover 1958) is a depiction of the sea floor underlying the area. Both reefs and the islands are situated on the Bellona - Rennell Bank that stands above the surrounding sea floor. A slightly greater amount of uplift of the bank at Rennell and Bellona, relative to the Indispensable Reefs, has resulted in the formation of the islands. Uplift has not been level across the islands, with the result that Rennell slopes downward to the southeast, its ancient lagoon forming the basin that is now Lake Tegano. Bellona further to the north, is on the other side of the uplift and slopes away slightly to the northwest. The level of the underlying sea floor at the Indispensable Reefs is lower and coral has grown upwards to sea level resulting in a uniform height for all reefs.*

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### ***3. IDENTIFICATION***

#### **3.1 Natural History**

##### **3.1.1 Overview**

**Rennell Island is the best example of an upraised coral atoll which has been largely unmodified by man and includes the largest lake in the South Pacific (excluding New Zealand and Australia). The fauna has a high degree of endemism and the flora is biogeographically unique. Rennell is listed in the only attempt made by the International Union for the Conservation of Nature (IUCN) to prepare an indicative list of potential natural World Heritage Sites. Rennell's special qualities have long been recognised by scientists and anthropologists and it has been a focus of study since 1928 involving researchers of many nationalities. The nominated area of East Rennell includes the lake as well as the best representative and best preserved examples of the island's outstanding universal values.**

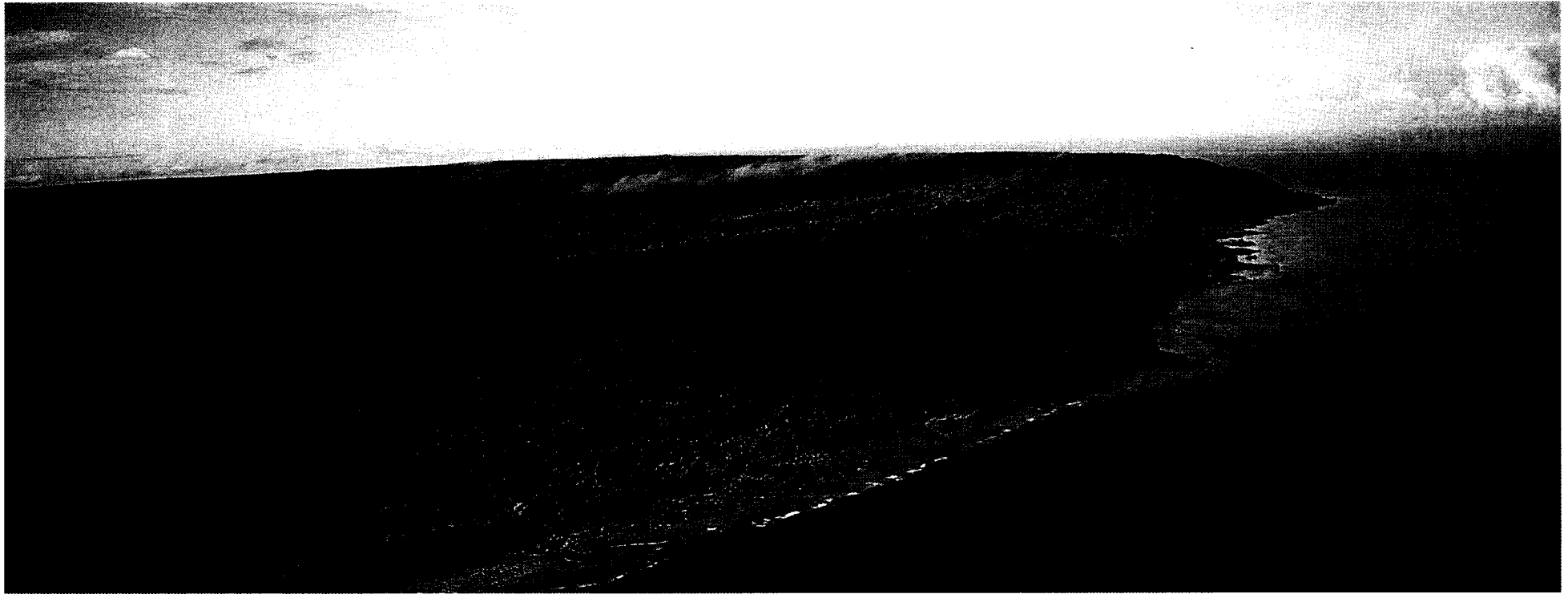
##### **3.1.2 Geology and Landforms - General**

The Solomon Islands are purely oceanic in origin. There is no evidence that pieces of older continents exist there. The basement rocks of most of the islands were formed along a spreading mid-ocean ridge sometime between

the late Cretaceous and early Eocene. Around the early Eocene, a convergent plate boundary formed in the vicinity of Rennell and Bellona, to the south of the main Solomons chain.



*Rennell is an uplifted coral atoll and has a uniform profile when viewed from the sea. (Photographer = Richard Marjzak).*



*An aerial view of the northern coast of Rennell where the former reef crests are clearly visible. (P. Ryan)*

## **Rennell and Bellona**

Near the end of the Pliocene, tectonic movements of the earth's crust raised the sea bed sufficiently to allow coral building on Bellona, Rennell and the Indispensable Reefs. These three areas today form part of the Bellona - Rennell Bank. During the Pleistocene and post - Pleistocene age, intensive coral formation occurred, aided initially by the taking up of sea water into the polar ice caps, which caused world wide drops in sea level. The coral atolls of Rennell and Bellona formed. Identification of calcareous algae and

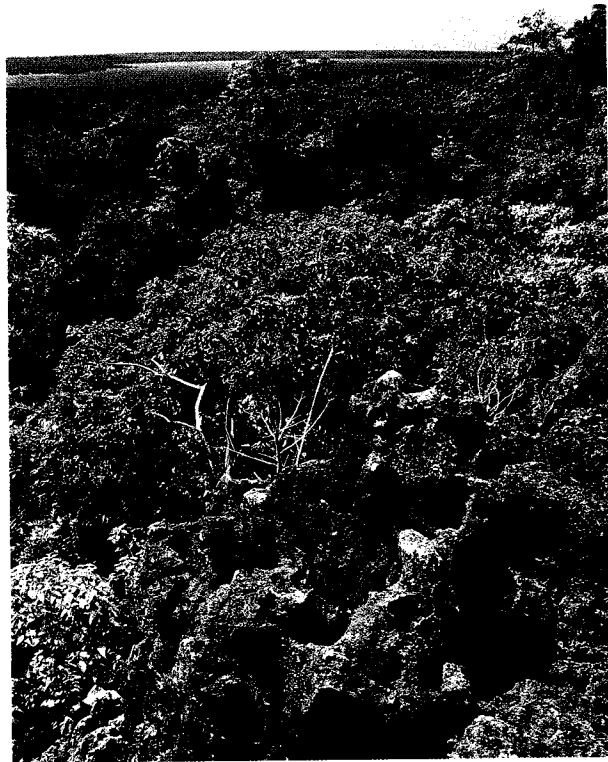
foraminifera from the cliff top at Tuhugago Bay, East Rennell indicated that the limestones of the island rim are not older than Pleistocene.

Rennell and Bellona are geologically younger than most of the rest of the Solomons and they have experienced different forces of emergence. Both islands are well away from the crustal plate collision zone and have a very low degree of seismic activity. They are not built on a sub-circular volcanic pile but on a structurally aligned crustal plate. In the early stages there was

crustal anticlinal folding and in more recent times, there has been pulsating vertical uplift of the sea bed on the southern side of the submarine trench which runs in parallel to the south west side of the Solomon Islands. Rennell and Bellona are thought to lie on a faulted basement ridge.

There have been at least five uplift events and these can be observed in the terraces indicating former sea levels on the cliffs of Rennell and Bellona.





*Limestone outcrops are common throughout Rennell contributing to a rugged landscape. (P. Ryan)*

## Geology

The whole Rennell area is thought to have been initially deposited as coralline algal limestone and then dolomitized. This dolomitic reef complex is overlain by younger undolomitized reef limestone. The recent structural evolution of Rennell is the result of post-dolomitisation uplift accompanied by block faulting. The north west part of Rennell has emerged as a

discrete block to a height of around 200 metres and shows no evidence of tilting. A major fault zone at Kagava Bay separates the northern and central blocks where the uplifted reefs have dropped vertically 30 metres. A major step fault also occurs across the northern part of Lake Tegano.

The structure and geomorphology of Rennell and Bellona indicate that the Rennell Ridge on which they are situated is presently in a phase of active uplift following a long history of subsidence. The thickness of the sedimentary pile above basement on the Rennell Ridge is at least 500 metres. According to current theories of atoll formation, such a thickness of reef deposits could form only on a slowly descending basement platform.

## Landforms

Rennell is 86 kilometres long and has an average width of 10 kilometres. Its long axis is aligned northwest. Rennell, in the centre of the submarine bank, has emerged about 108 metres. It is a large, bilobed atoll with an area of 840 square kilometres. The elements of the former lagoons can still be recognised: the outer reef slope, the rim, the inner lagoon beaches and the old lagoon floor which now contains Lake Tegano at East Rennell and forest at West Rennell. The rim of the old atoll falls precipitously around the coast of Rennell to end in a narrow fringing reef.

Rennell is extremely rocky with more than 75 percent of the land surface being pitted, etched and jagged limestone forming typical karst limestone landscape. The two basins of west and east Rennell meet at the island's narrow waist at Kagava Bay. The western basin has a maximum width of 14 kilometres and is about 45 kilometres long (with an area of approximately 470 square kilometres). The raised outer rim is terraced, with heights ranging from 150 to 200 metres. From the rim the land surface descends gradually inland to just above sea level at the basin centre where small swamps occur. Old lagoon deposits that were deposited on the floor of the basin while the atoll was still submerged are now represented by a series of reef flats and knolls. The land surface is irregular with limestone hillocks or mounds, 5 - 15 metres high, separated by concave or flat-floored hollows 5 - 100 metres wide. There is a small, high rocky area around fault-bounded Kagava Bay. Here, Lavagu Hill reaches approximately 180 metres.

The east Rennell basin is 10 - 12 kilometres wide and is 35 kilometres long (with an area of around 370 square kilometres). The outer rim is terraced and ranges in height from 55 to more than 150 metres. The land surface is rocky and irregular and is similar to that found in the west Rennell basin.



*An undercut coral limestone island in Lake Tegano, East Rennell. (P. Ryan)*

## **Lake Tegano**

Lake Tegano is contained in the central basin which was the old lagoon. It is 29 kilometres long and 10 kilometres wide (maximum dimensions) with an area of 155 square kilometres. The lake occupies 17.6 % of the entire area of Rennell and is the largest body of enclosed water in the insular Pacific. The central part of Lake Tegano forms a nearly unbroken plain with a depth rarely greater than 40 metres and a maximum depth of 43 metres. The hard bottom is overlain by several metres of suspended, flocculent mud, which is apparently anaerobic.

The age of the lake as a body of almost fresh water is unknown, although it seems probable that the lagoon was cut off from the sea not long after the uplifting began in the late Pliocene. The lake is brackish with the elevated salt concentrations being maintained by a subterranean duct system which connects it with the sea. Dolines (sinkholes), caves and scattered small freshwater swamps in the lower areas occur commonly as a result of sub-surface flow and solution weathering.

The lake lies at about sea level and is slightly saline (2.8 - 6.2 ‰) on average, varying from one tenth to one

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fifth of the salinity of sea water. The pH is slightly alkaline with recordings of 7.3 and 7.8. The water temperature is about 30° celsius and 3 - 5 degrees higher than that in the rock pools which are the drainage from rain water. The water is faintly sulphurous through the anaerobic breakdown of organic material.

There are many residual small islands at the western end of Lake Tegano that are eroding through solution of the limestone. This is accelerated by wave action. Most of the lake shore is bordered by limestone outcrops that vary in height although there are swampy areas at the northern end of the lake. In the south west of East Rennell, there are two hills named Soaika and Kasipa which rise about 75 m above sea level.

There are no streams or rivers on Rennell although there are freshwater springs around the lake edge and they emerge in various places from the cliffs at the coast. Sub-surface water flow is likely to be directed along the lower central axis of the island from the higher western end eastward until it enters the lake.

### **3.1.3 Soils**

The soils of Rennell are derived from weathered coral limestone and are present as small scattered pockets. There has been no soil enrichment by volcanic dust or sea-borne river sediment because of the great distance from the larger islands and the direction of the prevailing wind and sea currents. For further details see appendix B.

### 3.1.4 Climate

Rennell and Bellona experience a typical tropical climate characterised by high and rather uniform temperatures (between 22.7° C and 32.2° C) and humidity . Rennell and Bellona are much wetter than Honiara on Guadalcanal and are several degrees cooler. Rennell's annual rainfall indicates a range between 3000 and 4000mm. There are two distinct climates with west Rennell normally being drier and less humid than east Rennell which can be quite stormy.

No long term weather recording has been carried out on Rennell in the past. The island experiences an equatorial monsoonal climate. There may be a marked dry period from May to June during the middle of the trade wind season. This can extend from May to August with a very dry month in July. The southeast trade wind prevails from April to the end of November and during the rest of the year, the prevailing winds are from the west and northwest.

### Cyclones

These are the major natural force that influences the vegetation, fauna and lifestyle of the people on Rennell. Rennell is situated within the band of known cyclone paths and is subject to cyclones at relatively frequent intervals. Analysis of cyclone risk areas, using track density per grid square since 1966, reveals a maximum (6 per square) concentration of cyclones between Rennell and Makira (170 km to the east) and also in the area 50 km due north of Rennell. The two grid squares

which Rennell straddles have received a high number of cyclones (5 per square) during the period. Principal directions of cyclone travel are towards the southwest and southeast (see Map 4).

The latest major cyclone to hit Rennell was Nina in 1993 which caused extensive damage to the forests and villages. Cyclone Nina originated in the Gulf of Carpentaria and had time to intensify before reaching Rennell. People of Rennell relate that a cyclone more

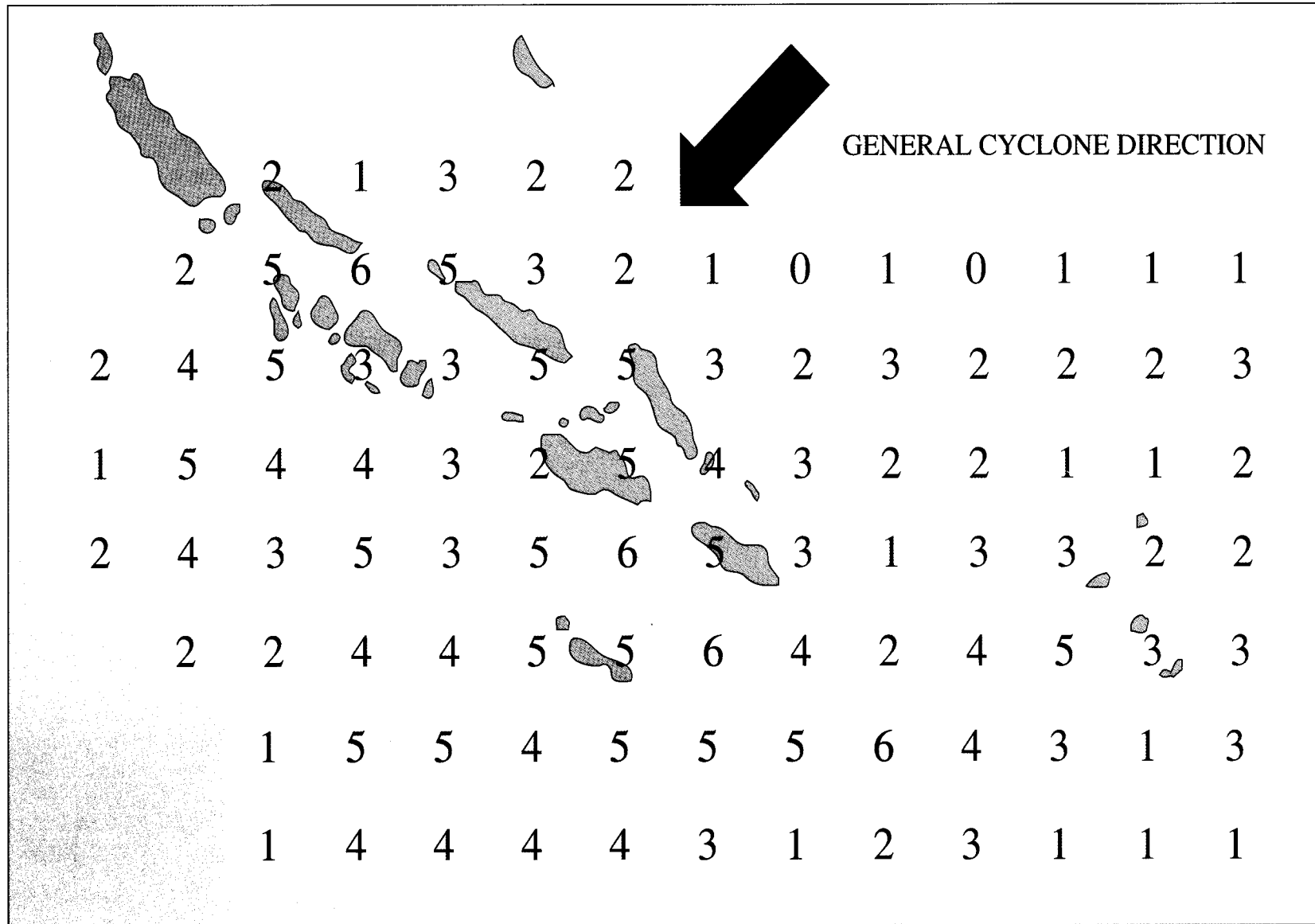
intense than Nina occurred between 1898 and 1900. After this cyclone, it was said that one could see from end to end of the island. This would explain the present structure of Rennell forests, where trees have lesser stem diameters than other forests in the Solomons. Cyclone Nina also led to a dramatic fall in the number of ground feeding birds and many dead birds and bats were found at the edges of the lake and sea shore when the cyclone abated.



*A view of tall forest looking towards Lake Tegano taken from a high point on the island rim near Tuhugago Bay. (Rob Greenaway)*



MAP 4



Cyclone risk areas for the Solomon Islands (track density per grid square since 1966). [ 0 - 2 = low density, 3 - 4 = medium density, 5 - 6 = high density (shaded)].  
 (After Wright and Schenk, unpub.)

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### 3.1.5 Vegetation

The flora of Rennell is significant and warrants World Heritage listing because the species composition is biogeographically unique. Although there are currently only ten endemic species recorded for Rennell, this is likely to increase as specialist collections are made. The endemic species found at East Rennell include an orchid found on the lake islands, three species of *Pandanus* and an undescribed palm.

The forest of the island interior is unusual in the composition of main canopy tree species. Many of the common canopy species on Rennell are uncommon elsewhere in the Solomon group. In contrast, most of the species common elsewhere in the Solomon Islands appear to be absent from Rennell. Included amongst the absentees are species which are present in the Santa Cruz group and some of those species are present on even more remote island groups in the west-central Pacific such as Fiji, Vanuatu, Tonga and Samoa.

There are three principal vegetation types on Rennell : low stature forest of the karst ridge on the island perimeter, tall forest of the island interior and the beach flora of the Lake Tegano Margin. There are also small areas of mangrove vegetation on the lake margin. The differences in species recorded and structural attributes between the karst ridge and island interior forests are the result of the different physical conditions on the exposed island margins (also with shallow soils) and the relatively sheltered island interior where deeper soils occur. For more details on forest types refer to appendix C.



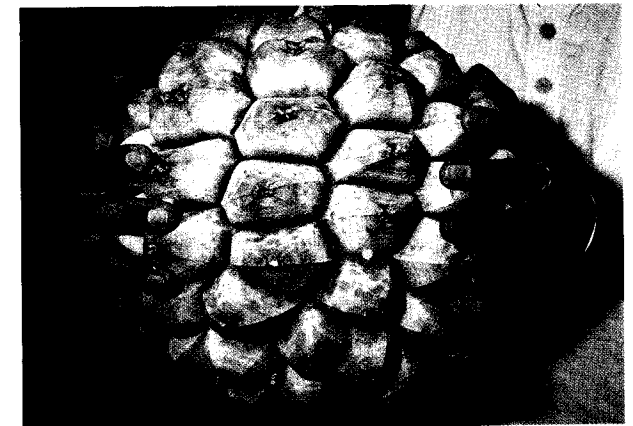
*Two types of Pandanus trees grow commonly around the lake. They are probably endemic species. The local people have different uses for these trees and they are highly valued. (P.Ryan)*

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### Flora of Lake Tegano:

The lake flora includes diatoms and algae. There is a rich variety of diatoms: 60 genera, 312 species and 80 additional varieties or forms. Of the 456 records of species, 61 percent were collected only in the lake and 34 percent occur in the lake and in rock pools. In the lake, freshwater species, alkaline forms and forms living in the littoral region of lakes, dominate. Most species are cosmopolitan and only eight species and four varieties are endemic.

Only one sample of algae has been studied. It contained five cosmopolitan species of blue-green algae and one green and one red alga (both identifiable to genus only). No phanerogams have been collected (i.e. plants with visible reproductive organs such as flowers or cones) and must, if present, be rare or sporadic.



*This is a Pandanus fruit ; the fruit of some species can be eaten. (P. Ryan)*

## Endemism:

To date, no endemic tree species have been found on Rennell but there are ten endemic plants that have so far been recorded. There is a rare endemic orchid (*Dendrobium rennellii*) which occurs on the small islands of Lake Tegano. There are also two endemic species of *Pandanus* (*P. lacustris* and *P. rennellensis*) and one is found at the lake margin (*P. lacustris*). Another new *Pandanus* has been collected but the specimen was too incomplete to enable description. There is an endemic, erect understorey palm (*Drymophloeus* sp.nov.) which is yet to be described.



*Dendrobium rennellii*, is a rare endemic orchid found on the small islands of Lake Tegano. (P. Ryan)

Other endemic vascular plants are;

*Pseuderanthemum bibracteatum* Fosberg  
(Acanthaceae); Rennell and Bellona

*Dischidia melanesica* Fosberg (Asclepiadaceae) ;  
Rennell

*Acalypha crockeri* Fosberg (Euphorbiaceae) ; Rennell

*Hedyotis rennellensis* Fosberg (Rubiaceae) ; Rennell

An endemic fungus, *Lasiochaeria noona-daniae*  
Carroll and Munk (Sordariaceae)  
has been recorded on Rennell.

A high degree of endemism in the flora would be unusual considering the lack of diversity of habitats on Rennell and the “youth” of the atoll. However, it is likely that more endemics will be found as specialist collections are made. During a five day visit by P.J. Cribb in 1989, the number of scientifically known orchid species rose from four to twenty-two, indicating how little is known by the scientific community about the vegetation of Rennell.

### The Biogeography of Rennell’s Flora:

The Solomon Islands constitute a major transition point in the sequence of decreasing floral diversity eastward into the tropical Pacific from Papua New Guinea. The sequence involves a decline in phanerogam genera from c.1400 in Papua New Guinea to c.650 in both the Bismarck and Solomon archipelagoes, to c.400 in Vanuatu, c.475 in Fiji, c.300 in Samoa and c.260 in Tonga and Niue. The Solomon group has been described as an important “terminus” since 162

phanerogam genera (c.25%) present there do not occur on islands to the east. The Santa Cruz group lying between the Solomon Islands and Vanuatu has 126 genera while recent studies suggest that Rennell has 203 genera.

Scientifically, the flora of Rennell offers researchers the opportunity to study questions on the dispersal of plants in western Melanesia. It also offers opportunities to study species composition of atolls and to identify patterns related to soils, age, cyclone disturbance, size, topography and location in relation to the nearest landmasses.

### 3.1.6 Fauna

**The fauna of the Solomon Islands is of considerable international importance. With the exception of Papua New Guinea, the Solomon Islands have a greater diversity of animal species and higher level of endemism than any other Pacific island nation. Within the Solomon Islands, Rennell has the highest occurrence of endemism for an island of its’ size. Rennell is famous for having developed many unique species and races of birds because of its isolation. This unique fauna is an educational and scientific resource of importance to the world.**

Little is known of the ecology and habitat preferences of most animal species.

## Mammals

Rennell has eleven species of bats and they are the only indigenous terrestrial mammals. There is one endemic bat species; the Rennell Flying-fox (*Pteropus rennelli*, local name = Langa) and there are two endemic subspecies (27%); the Diadem Horseshoe-bat (*Hipposideros diadema*) and the Large-eared Sheath-tail-bat (*Emballonura diana diana*). The Rennell Flying-fox is considered vulnerable or endangered. It is known from only five specimens and the two most recently collected, in 1962 and 1965, came from East Rennell.

The fruit bats (Family = Pteropidae) are the most diverse family of bats in the south west Pacific. They also have an extremely high degree of endemism. The diversity and wide distribution of this fruit-eating group of mammals is paralleled among birds in the fruit-eating doves and pigeons which are a major proportion of the avifauna.

Rennell has three species of large, fruit-eating bats and they are important in spreading the seeds of trees. They are ; the Solomons Bare-backed Fruit-bat (*Dobsonia inermis*, local name = Puli); the Rennell Flying-fox and the Pacific Flying-fox (*Pteropus tonganus*, local name = Peka). These bats are probably the sole agents that spread the canoe trees (*Palaquim amboinense* and *Inocarpus fagiferus*, local names = Ghaimega and Isi) ; the timber tree (*Xanthophyllum papuanum*, local names = Aliupagegho), the secondary forest staging trailer / shrub (*Dendrocnide rechingeri*, local name = Siago)

and the edible fruit tree, *Eugenia aquea* (local name = Ghaghaga) which has been introduced from Malesia .

The other bat species feed on insects and they are not unique to Rennell. The non-endemic bats appear to be derived from three groups; an "oceanic" group with only one species, the Pacific Flying-fox. It is



A juvenile Pacific Flying - fox (*Pteropus tonganus* , local name = Peka). They are widespread and are good flyers. They may have colonised Rennell naturally or they could have been introduced by Polynesians. (P.Ryan)

widespread and a good flyer and could have colonised naturally. These flying-foxes were carried as pets by Polynesians so it is possible that it may have been introduced to Rennell.

The second group has species derived from the Solomon Islands and, more distantly, Papua New Guinea. This includes the Solomons Bare-backed Fruit-bat; the Large-eared Sheath tail-bat ; the Spurred Horseshoe-bat (*Hipposideros calcaratus*, local names = Lakulaku and Tagingaabaga) and the Large Melanesian Bentwing-bat (*Miniopterus propitristis*).

The third group consists of species with widespread distributions and that have a good ability to colonise. These are the Fawn Horseshoe-bat (*Hipposideros cervinus*), the Trident Horseshoe-bat (*Aselliscus tricuspidatus*), the Little Bentwing-bat (*Miniopterus australis* , local name = Lakulaku) and the Common Bentwing-bat (*Miniopterus schreibersii*, local names = Lugilugi and Tangingaabaga).

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## Birdlife

### Species Diversity and Endemism

**Rennell has 43 breeding land and water bird species, of which four are species endemic to Rennell, nine are subspecies endemic to Rennell and seven are subspecies endemic to Rennell and Bellona. The proportion of endemic taxa (47 %) that is found on Rennell (including the seven subspecies also found on Bellona) is extremely high. The East Rennell area is important because it includes all the habitats found on Rennell and it contains a viable representation in natural conditions of most of the endemic bird species.** The endemic species are actually endemic allospecies i.e. members of superspecies whose other allospecies occur on other Pacific islands. Bellona has 15 breeding bird species of which seven are the subspecies endemic to Rennell and Bellona.

Why does Bellona have so few species and why does Rennell have so few species compared to similar-sized islands located centrally in the Solomons (e.g. 65 breeding species on the nearly equal-sized Vella Lavella and Kolombangara) ? Why does Rennell have such a high degree of endemism, the feature for which it is famous ?

These questions of species diversity and endemism are not unique to Rennell and Bellona but arise with any island. The number of breeding bird species on Solomon islands increases with island area and decreases with island isolation. Rennell and Bellona

have close to the number of species expected from their isolation 160 kilometres from the main chain of the Solomons and from Rennell's moderate area of 684 square kilometres and Bellona's small area of 19.7 square kilometres. Larger islands have more species because they have more habitats and also larger populations are less at risk of extinction. Remote islands have fewer species because they receive immigrants at a lower rate.

The percentage of endemic bird taxa on Pacific islands increases with island area and isolation because development of an endemic taxon requires that a colonist population survive long enough to differentiate. On small islands near colonization sources, colonists arrive too often and disappear too quickly to differentiate. Rennell has evolved its famous "endemic status" because it is by far the largest out-lying island in the Solomons. Bellona is poor in endemic species because it is too small for populations to survive for long in isolation.

For details on the origins of the avifauna, see appendix D.

### Birds Endemic to Rennell and Bellona

The Australian Dabchick (*Tachybaptus novaehollandiae rennellianus*, local name = Manusigi) a subspecies endemic to Rennell. It is found around the lake shore where it is fairly common. It occurs singly or in pairs and in calm weather can be found at the centre of the lake.



*The Little Pied Cormorant (Phalacrocorax melanoleucos, local name = Manukitai) is common at Lake Tegano and nests in the forest at the lake edge and on the islands. (P.Ryan)*

The Little Pied Cormorant is also a subspecies endemic to Rennell. It is common at Lake Tegano, swimming in many islands including Tautiage, Sangingagito, Gigiogo and Halogu.

The White Ibis is a subspecies endemic to Rennell and Bellona. It is fairly common in groups of up to 30 birds. It feeds on the ground on earthworms and grubs and can be seen in villages with the chickens, along roads, on sandy or rocky beaches and even in the forest. When breeding, it nests in small colonies in trees in the forest or on the lake islands.

Grey Teal (*Anas gibberifrons remissa*, local name = Ghamanaghi mai Hatuhoa) is a subspecies endemic to Rennell. It is possibly extinct. It had been collected in 1928 from Lake Tegano by the Whitney Expedition but has not been observed since. It could have been over-hunted or it is possible that the introduction of the fish *Tilapia mossambica* to the lake affected its' food supply.



*The White Ibis (Threskiornis molluccus pygmaeus, local name = Tagoa) is a subspecies endemic to Rennell and Bellona and is commonly seen near villages. (P.Ryan)*

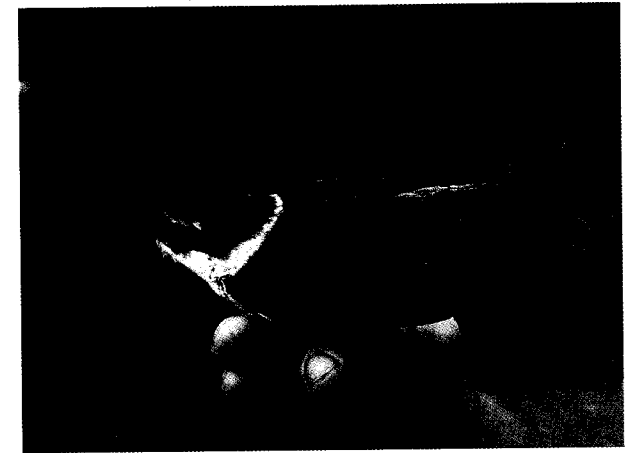
The Pink-spotted Fruit Dove (*Ptilinopus richardsii cyanopterus*, local name = Higi) is a subspecies endemic to Rennell and Bellona. It is one of the commonest and most ubiquitous species of Rennell both in forest and second-growth. It is found mainly in the canopy but comes lower, to about 4 metres from the ground, in second-growth. It occurs usually singly or in pairs but occasionally forms groups of up to 30 when

feeding on fruits such as figs. It flies at canopy level and its diet is of fruit (at least 38 different species taken) from 0.1 to 3 cm in size. It sometimes hangs upside down from a branch to pick fruit. It nests in trees and has a single egg.

The Song Parrot (*Geoffroyus heteroclitus hyacinthus*, local name = Ghisua) is a subspecies endemic to Rennell. It is fairly common, particularly at West Rennell, and occurs in groups of up to four in the canopy or in the crowns of trees near the forest. It is not found on the lake islands. It eats large fruits that require biting and nests in holes in dead trees. It has two young.

The Shining Cuckoo (*Chrysococcyx lucidus harteri*, local name = Tangione) is a subspecies endemic to Rennell and Bellona. It is common singly in the forest and is heard more frequently than seen. It is also found on the large islands of the lake. It feeds on caterpillars from leaves and it parasitises the nest of the Fantail Warbler.

The Glossy Swiftlet (*Collocalia esculenta desiderata*, local name = Pekapeka) is a subspecies endemic to Rennell and Bellona. It is common and flies slowly with a fluttering wing beat. It does not fly high in the open but forages low over the ground in gardens, on the beach, over forest-hung roads, close to cliffs or close to the crown of trees. It has been seen on three lake islands. It roosts in limestone caves and nests made of moss and feathers have been found in large crevices in almost vertical cliffs along the coast.



*The White-collared Kingfisher (Halcyon chloris, local name = Ligho) is a subspecies endemic to Rennell and Bellona. It is fairly common. (Mary LeCroy)*

The White-collared Kingfisher is a subspecies endemic to Rennell and Bellona. It is fairly common in the forest crown and middle storey and is occasionally seen on the ground. It is solitary but is sometimes seen in pairs. It has been recorded from the islands on the lake and it feeds on lizards and large insects. It nests inside termite mounds.

The Island Thrush is a subspecies endemic to Rennell. It is fairly common and is found in the forest and dense second growth, always within or close to cover. It is not found on the islands in the lake. It is strictly solitary and usually seen on the ground where it forages for invertebrates, especially earthworms and snails. Its nest consists of a moss cup outside, lined with fine vines. It nests in trees and there are usually one or two young.





*The Island Thrush (Turdus poliocephalus rennellianus, local name = Gagango) is a subspecies endemic to Rennell. It is fairly common and is found in the forest or in dense second growth. (M. LeCroy)*

The Fantail Warbler (*Gerygone flavolateralis citrina*, local name = Lokeloke) is a subspecies endemic to Rennell. It is a very common bird in forest and second-growth and it is found in the understorey to lower crown. It is mostly seen in pairs and threes and rarely singly. It was found on most islands in the lake. It makes a basket nest at a height of about 3 - 6 metres, suspended from a vine or limb and with a side entrance, and lays two to three eggs. This species is the main victim of the parasitic Shining Cuckoo.

The Rennell Fantail (*Rhipidura rennelliana*, local name = Maghihape) is a species endemic to Rennell. It is fairly common in the forest and second-growth, usually near cover but it is not found on the lake islands. It is seen singly or in pairs and joins mixed- species flocks. It is usually seen at lower levels in the forest and often on the ground. The wings are held drooped.

It often perches on vertical trunks or vines and catches insects by hover-gleaning off leaves, plucking off bark and in flight while doing acrobatic spins and twists. It even plucks spiders from their webs. The nest is in the understorey and has one young.

Other allospecies in the same superspecies are:

<i>Rhipidura drownei</i>	Bougainville and Guadalcanal
<i>Rhipidura tenebrosa</i>	San Cristobal
<i>Rhipidura spilodera</i>	Vanuatu, New Caledonia and Fiji
<i>Rhipidura nebulosa</i>	Samoa

The Rennell Shrikebill is a species endemic to Rennell. It is a common bird throughout the forest but is mainly seen below 10 metres. Only one was seen on an island in the lake. It is usually seen singly or in pairs and infrequently in mixed species flocks. It moves by short hops and feeds by gleaning and hover-gleaning, occasionally by sallying. Prey includes locusts, grasshoppers, stick insects, snails and lizards and are very often large. The nests are made of moss and they have one or two young.

Another allospecies in the same species is *Clytorhynchus nigrogularis* Santa Cruz and Fiji

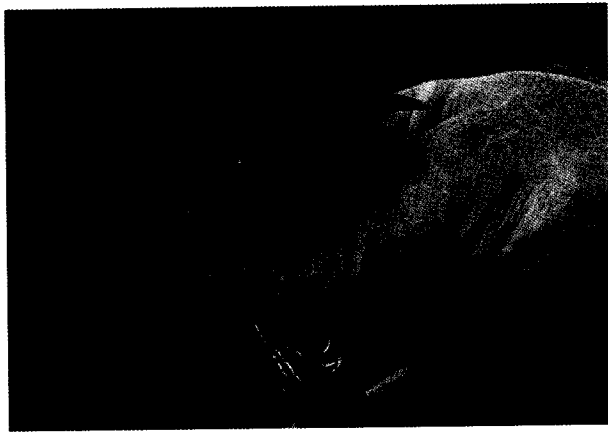
The Broad-billed Flycatcher (*Myiagra caledonica occidentalis*, local name = Tangitangibilage) is a subspecies endemic to Rennell. It is uncommon and is more often heard than seen. It is usually in the crown and middle storey of tall forest vegetation and generally



*The Rennell Shrikebill (Clytorhynchus hamlinii, local name = Ghoghobiu) is endemic to Rennell and is common in the forest. (P.Ryan)*

not in very exposed places. It is solitary or in pairs and feeds by sallying to hover-glean. It tail-quivers like other members of the Flycatcher family. It nests in the middle storey of tall forest trees and the nest is a small, woven cup.

The Golden Whistler (*Pachycephala pectoralis feminina*, local name = Taataga) is a subspecies endemic to Rennell. It is moderately common with regularly spaced territories in tall forest and dense second-growth. It is more often heard than seen and is never seen in the open and rarely at the forest edge. Unusually the Rennell race often feeds on the ground. When foraging, it perches for 5 - 50 seconds, peering intently, then hops a short distance to a new perch. It perches on the trunks of vertical saplings, hops on the ground, on fallen logs and hops up vines. The diet consists of invertebrates. It is one of the smaller races of Golden Whistler. The nest has only one young.



The Rennell White-eye (*Zosterops rennelliana*, local name = Suusuubagu) is endemic and is an uncommon forest bird. (M. LeCroy)

The Rennell White-eye is a species endemic to Rennell. It is an uncommon forest bird and is found mainly in the understory and middle storey of forest and second-growth. It is absent from the islands on the lake. It is seen in pairs, sometimes singly or in groups of three, but it never forms large flocks although it will join mixed-species flocks. Its diet consists mainly of insects and some fruits but these are limited to those smaller than 0.8 cm. The Rennell White-eye feeds from bark, on trunks, hops up vines, hover-gleans, hangs upside-down and gleans at dead leaves and twigs. The nests are woven cups 3 - 5 cm in diameter with live green moss on the outside and dry fibres inside.

Other allospecies in the same species group are;

<i>Zosterops rendovae</i>	New Georgia Group
<i>Zosterops luteirostris</i>	Gizo
<i>Zosterops splendida</i>	Ranonga
<i>Zosterops vellalavella</i>	Vella Lavella

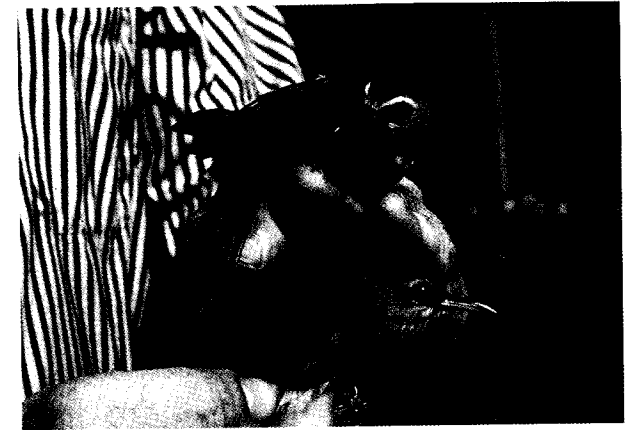
*Zosterops griseotincta* southeast Papuan islands,  
Nissan and several  
Bismarck islands.

Woodford's White-eye is a species endemic to Rennell. It is a very common bird both in the forest and near gardens and occurs on the islands in the lake. It is mainly seen in the middle and understory of the forest and usually in small groups of three and, sometimes, up to six. It joins mixed-species flocks. The foraging technique and diet are varied. It gleans insects, especially caterpillars from leaves, hops up vines, hangs upside-down to glean, captures spiders and eats land snails. The diet also includes many fruits; small fruits are swallowed whole while large fruits are pecked at. Nests are woven cups of twigs, fine fibres and vines with a few bits of green moss on the outside. The clutch size is generally two, sometimes one.

There is one other allospecies:

*Woodfordia lacertosa* Santa Cruz

The Cardinal Honey-eater (*Myzomela cardinalis sanfordi*, local name - Baghigho) is a subspecies endemic to Rennell. It is a very common bird near coconut palms and moderately common in the forest. It is found on all the lake islands where it is the most abundant species. It is seen singly or in pairs and occasionally in mixed-species flocks. It feeds mainly by gleaning insects from leaves and occasionally hovers to take spiders from webs. It also probes flowers. Nests are cups of dry fibres and the clutch is two, occasionally one.



Woodford's White-eye (*Woodfordia superciliosa*, local name = Ghagha) is a species endemic to Rennell and is commonly seen in the forest and gardens. (M. LeCroy)

The Rennell Starling (*Aplonis insularis*, local name = Ghaapilu - mouku) is a species endemic to Rennell and Bellona. It is a moderately common forest bird usually seen in pairs but occasionally singly or in threes. It is found on the lake islands and it can easily be recognised in flight from the Singing Starling by its short tail. It is widely distributed over Rennell while the Singing Starling is confined to the vicinity of the lake. The diet is diverse with fruit of many species, such as figs and pawpaw. Insects and land snails are also eaten. Land snails are taken to a particular stone which is used as an anvil and where broken shells accumulate. The nest is a hole in a dead tree that provides a soft cavity such as a pandanus or pawpaw trunk. The clutch size is two or three.

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## Freshwater Fish

The two known species found in the lake ; *Anguilla obscura*, an eel and *Eleotris fusca*, a bully, are usually found in fresh or brackish water. The eel migrates to the sea to breed.

## Marine Fish

The Templeton Crocker Expedition collected 36 species of marine fishes on Rennell, 20 on Bellona and three on both islands, including a new flying fish of the genus *Cypselurus* from Rennell. The Danish Expedition in 1951 added another 19 species to the Rennell list including two small blenniid species and one small *Kraemia* which were new to science. With other visits from scientists, the fish list for Rennell has continued to grow.

## Herpetology

Lake Tegano is the only location for the endemic sea krait, *Laticauda crockeri*. It is the second record of a sea snake living in a freshwater lake ; the other is from Lake Taal, Luzon in the Philippines. The sea krait is thought to have evolved in isolation during one of the periods when Lake Tegano became cut off from the sea. The other species of sea snake in Lake Tegano, *Laticauda colubrina*, has a wide distribution throughout the region.

*Laticauda colubrina* often tends to come on land when not foraging and hides in rock crevices and holes but *L. crockeri* never comes on land. *L. colubrina* can often be



Villager with the endemic sea krait (*Laticauda crockeri*, local name = Tugihono'ugi) in Lake Tegano. (P.Ryan)

found resting on the small islets in the lake. *L. crockeri* feeds on the native goby, *Eleotris fusca*, while *L. colubrina* prefers the eel, *Anguilla obscura*. Neither species of snake feeds on the introduced fish, *Tilapia mossambica*.

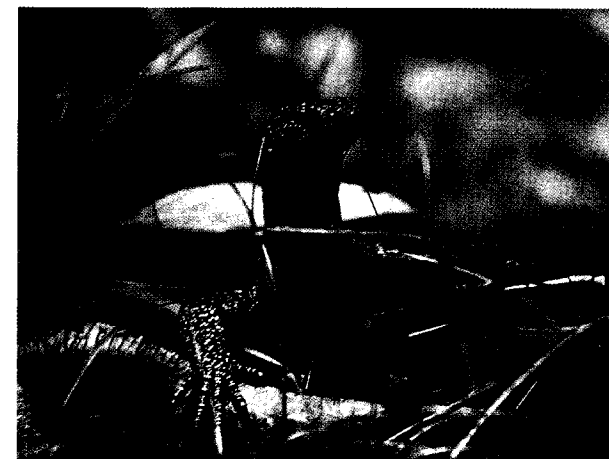
Both species forage by swimming near the bottom and investigating crevices. They forage at depths ranging from a few centimetres to about 13 metres. *L. colubrina* grows much larger than *L. crockeri*. All large females of *L. colubrina* weighed more than 1000 g which is much more than the heaviest mature female of *L. crockeri* (280g). According to East Rennellese, *L. colubrina* is an egg-laying species while *L. crockeri* gives birth to live young. This has been confirmed for *L. colubrina* but not for *L. crockeri* as yet.

It is likely that *L. crockeri* represents a relict of a regional population of *L. laticaudata* which was either widespread in the Solomon Island region or was a

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geographical outlier of the principal population. *L. crockeri* has evolved a number of distinctive features, of which the most obvious are its small size at maturity and well-developed melanism.

No amphibians have been recorded from Rennell. This is unusual as the rest of the Solomon archipelago has a rich and peculiar frog and toad fauna. Their absence is probably explained by the topography i.e. the raised coral atoll and the absence of surface water except for Lake Tegano which has slightly brackish water, factors making invasion by amphibians impossible.

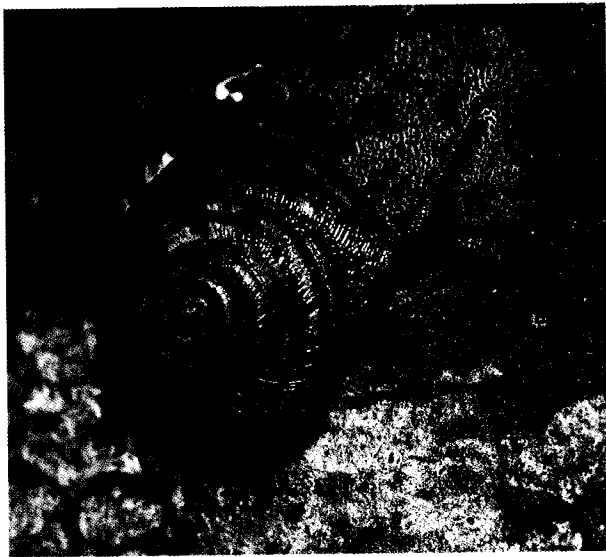


The Monitor Lizard (*Varanus indicus*, local name = Te Hokai) is commonly seen on the shores of Lake Tegano. (R. Marjak)

There are five species of geckos, four skinks, one monitor lizard (*Varanus*) and three snakes (two boas, *Candoia*, and one blind-snake), all of which are species with widespread distributions and are typical of the region.

## Land Snails

Rennell has 27 species of land snails belonging to 15 families. Seven species are endemic and two species are restricted to Rennell and Bellona (total = 9, endemism = 33%). The genus *Quirosella* (Ariophantidae) is endemic and is related to snails found in the Admiralty Islands north of eastern New Guinea. Three species of *Quirosella* have evolved and at some sites, they occur together. Why they differentiated is hard to explain considering the fairly uniform environment on Rennell.



An unidentified land snail, probably endemic, from East Rennell. They are reasonably abundant in the forest after rain. (P.Ryan)

## Crustaceans

The coconut crab (*Birgus latro*) and two or three other species of land hermit crabs (Coenobita) occur on Rennell. Coconut crabs have been harvested by the local people since the opening of the road in 1995 and larger animals are becoming harder to find. Two large and two small species of land crabs are found throughout the forest.

Coconut crabs have been eaten to extinction in some islands and need to be harvested with care as they mature slowly and reach harvesting size of two kg at 30 years. The crab is nocturnal and usually lives less than one kilometre from the sea. Their favourite food is the juicy flesh inside young coconuts. The crab has a large body cavity under its shell where it stores coconut oil for its annual hibernation. It is thought that the crabs climb coconut trees and break off a number of nuts which fall to the ground. Some will split open and the crabs work on these to get into the flesh. They may spend up to two days eating the coconut.



The Coconut Crab (*Birgus latro*, local name = *Kasusu*) are very slow growing and can take 30 years to reach harvesting size of two kilograms. They are becoming less common on East Rennell. (P.Ryan)

## Insects

Moths (Lepidoptera) have the greatest number of species (total = 246) of the insect groups recorded from Rennell. Of these, 35 species and 25 subspecies are endemic to Rennell and 5 species and 6 subspecies are found only on Rennell and Bellona. When these figures are combined (total = 71), 29% of the moths are endemic.



*This unidentified species of moth found at East Rennell roosts on the vertical strands of spider webs. (P.Ryan)*

The intense scientific interest in Rennell over the years has resulted in many insect collections. The biological significance of recording 246 species of moths on Rennell is unknown but it may be linked to the composition of the forest as some bats and moths play an important role as plant pollinators. This number of moth species may be typical for an island of this size but without more scientific investigation, it is not possible to make comparisons. Also, the level of endemism cannot be put into context at this time because there is no comparative information for other islands in the Solomons group.

### The Fauna of Lake Tegano:

A total of 78 species of animals were recorded from the lake. Of these, 56 were identified and there were 12 species and one subspecies that are endemic to the lake.

Also, three genera of crustaceans are endemic to Lake Tegano.

The fauna includes: two sea snakes, two fish species, six lake gastropods, 22 lake crustaceans, 40 lake insects (20 in the larval stage only), one water mite, two annelids, two nematodes and one leech. Four additional mosquito larvae are known only from small pools of stagnant water. Only 18 % (14 of the 77 species) are of marine origin.



*A Macrobrachium prawn from Lake Tegano. It is probably an endemic, undescribed species. (P.Ryan)*

## 3.2 HISTORY OF HUMAN OCCUPATION

### 3.2.1 Traditional History:



*A cultural group from Rennell and Bellona performing a traditional dance. They are wearing tapa cloth. The building in the background is a reconstruction of a chief's house. (R. Marjzak)*

Between 2000 and 1600 BC, people of the Lapita culture appeared. Over a millenium, with long-range canoe voyages, their distinctive pottery was distributed throughout the Pacific at sites from the Bismarck Archipelago in eastern Papua New Guinea to Samoa. It has been suggested that the Lapita people were the ancestors of modern day Polynesians but it is more likely that they were absorbed into pre-existing races, as remains of their pottery show signs of cultural change from the 2nd century AD onwards. Lapita people briefly occupied Bellona in about 1 000 BC.

The next settlements occurred on both Rennell and Bellona around 130 BC, with another major occupation in about 1000 AD thus giving Rennell great cultural significance in the history of Polynesian settlement across the Pacific. The population on Rennell and Bellona is the western-most Polynesian settlement in the Pacific. The present-day inhabitants say their ancestors landed on Bellona around 26 generations ago in about 1400 AD. There were eight couples led by a chief called Kaitu'u. Each couple produced a clan but only two clans survived. Three subclans traditionally

occupied the western, central and eastern parts of Rennell and all had a patrilineal descent system.

The people of Rennell and Bellona claim their ancestors came from Uvea, or Wallis in the Wallis and Futuna group. The two islands were free of cannibalism but had long periods of internecine war, with people from the east and west ends of both islands fighting each other. This continued until around the 1930's.

### 3.2.2 European Contact and the Missionaries:

There is some uncertainty about the European discoverers but it is thought that the two islands were officially discovered in 1793 by Captain Boyd in the merchant ship Bellona, after which the smaller island was named. It is possible that Boyd only sighted Bellona as there are claims that Rennell was discovered in 1794 by Captain Butler of H.M.S. Walpole. Undoubtedly traders, whalers and recruiters for the Queensland cane fields called there during the nineteenth century, but lack of a safe anchorage, the isolation and infertility of the island and shortage of easily obtainable fresh water prevented European settlement and establishment of trading stations. Rennell and Bellona were declared a British Protectorate in 1898 and no-one was allowed to land on the islands without permission from the Government. It is thought that there were only five short visits by Europeans before Bishop Selwyn's brief visit in July 1856. Bishop Selwyn became missionary bishop to the diocese of New Zealand in 1841 and in the following 26



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years, he established the Anglican Church as the pre-eminent Church in New Zealand. When he arrived at Rennell he met around 20 people and 13 warriors on Bellona.

The first missionaries came in 1910 and three Melanesians stayed. An epidemic followed during which many people died and the missionaries were blamed. The pagan priests realised that this new religion represented a threat to their traditional authority and so the three missionaries were killed.

The Protectorate government closed Rennell and Bellona to outsiders to prevent further casualties and also to protect the local people from foreign diseases because they had no immunity. Isolation lasted until 1934 when three mission ships arrived to recruit a few villagers for religious training. The trainees returned in 1936. For the next two years, the people of both islands worshipped their ancient gods alongside Christianity.

The inevitable climax came in September 1938 when a Christian Rennellese teacher, Moa, set out for Bellona in a storm which miraculously abated once he had prayed. He arrived in Bellona during a major skirmish and he destroyed the two sacred statue-gods which had been brought from Uvea by the original settlers. Bellonese pagan priests predicted his immediate death for this act of blasphemy but he survived. Moa then healed a dying priest and other people too. Because of these acts and the failure of the gods to punish him, the Bellonese became Christian.

In October 1938 on Rennell, even more dramatic events took place during the so-called Niupani Madness. Those who were undecided between Christianity and paganism were keen to find out which religion was the stronger. Believers were called on daily to pray to God or, in the pagans' case, Semoana. One of the undecided advised the Christians to get ready for the Day of Judgement, claiming only married people could go to heaven. All the Christians were married - adults, teenagers, children, handicapped people and infants. When the Day of Judgement failed to materialise, Christians attacked non-Christians and vice versa. Several people were killed. After three days the fervour subsided and the dead were buried. At a church service a few days later, a picture of Jesus was seen to speak. His lips appeared to move but no sound was heard. This was widely reported around Rennell, convincing the vast majority to become Christian and so ending the madness.

### 3.2.3 Scientific Expeditions:

**Rennell has been studied as part of eight major scientific expeditions. This indicates the high regard in which Rennell is held by the world scientific community. There are eight volumes on “The Natural History of Rennell Island” which contains mainly zoological studies collated and edited by Torben Wolff of Denmark. The American Professor, Jared Diamond explained the endemism on Rennell using the “theory of island biogeography” for which he is internationally recognised. The clarity with which the birds of Rennell demonstrate island**

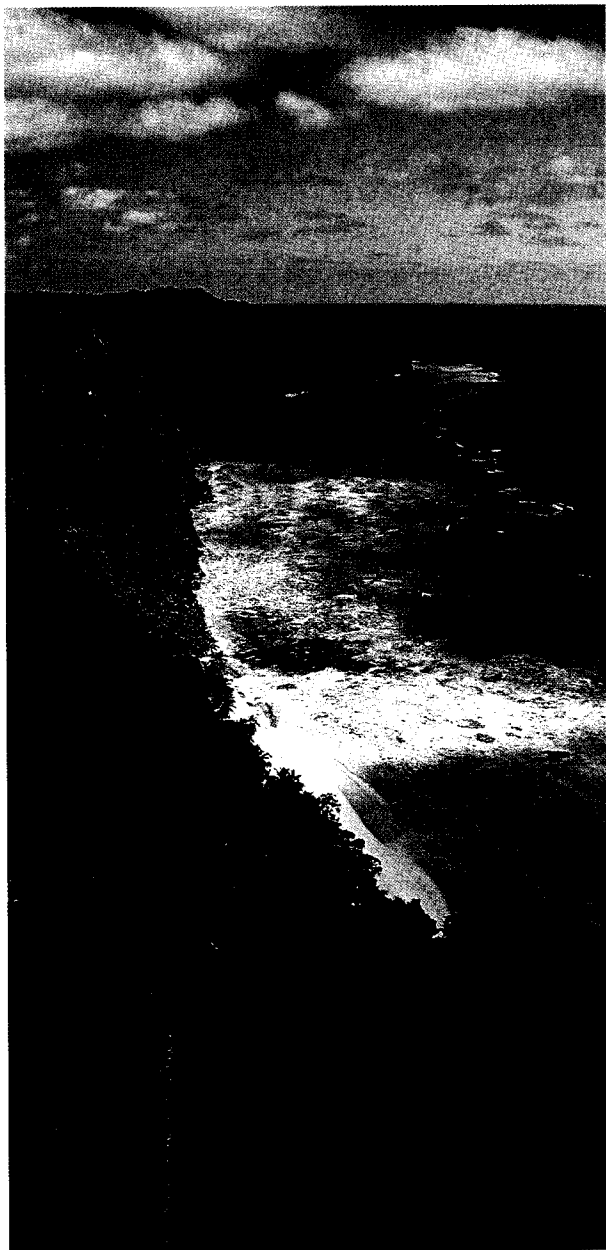
**biogeography has meant that they are often used as textbook examples in educational institutions throughout the world.**

The first extensive study of the fauna of Rennell was made by the American, Whitney South Sea Expedition (in 1928 and 1930) which concentrated on birds but made small collections of reptiles and snails. In 1933, the Templeton Crocker Expedition visited the island and collections of birds, reptiles, fish, flies, ants, algae and vascular plants were made. Some other visitors (e.g. the geologist, G.A.V. Stanley) brought back a few specimens of animals and a single orchid.

In 1951, four members of the Danish Galathea Deep-Sea Expedition spent around five weeks on Rennell. The main purpose was ethnological studies of the Polynesian population and the party included an ethnologist, a photographer and two zoologists (including T. Wolff). In 1953, two zoologists from the British Museum of Natural History spent six weeks on Rennell and Bellona and collected insects, bats and birds. Just prior to this visit, a short trip was made to



*A Buprestid beetle. It is commonly seen in the forest near Lake Tegano. (P. Ryan)*



*A reef encircles Rennell. The waters are crystalline clear as there are no streams to empty run-off into coastal waters. This view is taken from the island rim at Tuhugago Bay, East Rennell. (P. Ryan)*

Rennell and Bellona by two parasitologists to study mosquito larval ecology and malaria distribution.

In 1954, an entomologist made two trips to Bellona to collect butterflies and in 1955, another entomologist collected aquatic bugs and several other insect groups from Rennell and Bellona. Local people were trained to use a Berlese funnel for insect collections for the Department of Agriculture, Honiara.

The last leg of the Danish Noona Dan Expedition spent two and a half weeks on Rennell in 1962. The party consisted of an entomologist, botanist, hydrologist and zoologist. The zoologist (T. Wolff) returned in 1965 when he spent three weeks on Rennell, studying the lake and flora and fauna, prior to joining the American Te Vega Expedition. When the Te Vega Expedition arrived at Rennell, marine fish were collected. The results of most of these collections have been published in the eight volumes of "The Natural History of Rennell Island, British Solomon Islands", (Ed.) T. Wolff.

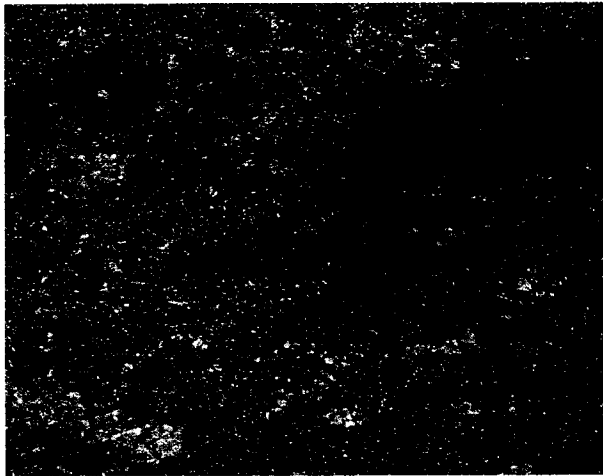
In addition to the original ethnological studies done on Rennell in 1951 (by K. Birket-Smith), the language, folklore and religion of the Rennellese and Bellonese have been extensively investigated by Professor S. Elbert, Honolulu (in 1957-58 and in 1962) and by Dr. T. Monberg, Copenhagen (in 1958-59, 1962 and in 1963). A number of books have been written as a result of these visits. Social organisation was studied on Bellona in 1962 (Mr. L. Christensen) and economic subsistence in 1965 and 1966 (Dr. S. Christiansen).

Since then there have been occasional visits by scientists, usually in response to some development initiative such as the proposed bauxite mining that was

considered in the 1970's. One such scientist was Professor Jared Diamond who recognised the significance of the high degree of endemism of Rennell's avifauna and was able to explain it in relation to the "theory of island biogeography". It is this phenomena which is so easily seen on Rennell that gives the island scientific and educational value that is of significance to the world.

More recently, in the 1990's a scientific team on behalf of the Australian National Parks and Wildlife Service, visited to consider areas for selection as part of a national system of protected areas. To quote the report, "The island is of outstanding conservation value and one of the best natural assets of the Solomon Islands". There have also been visits by a group from the Australian National Museum to survey and collect mammals and an AusAid funded study which was part of a nationwide survey: the Solomon Islands National Forest Resources Inventory. In 1994 a rapid ecological assessment of the marine resources of Rennell and Indispensable Reefs was made. The flora of Rennell has not been studied in as much detail as the fauna but a description of the forest types and species associations that are found on Rennell, is in preparation (Wright, S.D. and J.Schenk). Staff from the Honiara Herbarium are keen to visit Rennell and make collections.

An ornithologist (J.M. Pegler) has made annual, fortnightly visits to Rennell since 1991. Her information is of considerable interest because it documents the impact of cyclone Nina in 1993 and the recovery of the bird population.



*Kayak over the reef at Tuhugago Bay, East Rennell. (R. Greenaway)*

### 3.2.4 Cultural Change:

In pre-Christian times (before 1938), settlements were scattered with each being associated with a land-owning patrilineage. With the adoption of Christianity the old settlements on both islands were abandoned. Everyone moved into larger villages with newly built churches in the centre. The ancient rituals, gods and traditions were replaced by fundamentalist Christianity. The two main churches on Rennell and Bellona are Seventh Day Adventist and the South Seas Evangelical Church. They prohibit ancient activities such as traditional dancing, tika-dart throwing (a .75m javelin-like dart with a heavy, narrow, ellipse-shaped, stone front end which could be thrown almost 100m by a skilled warrior), shark fishing, eel netting, bird and flying-fox snaring, harvesting shellfish and coconut crabs, and searching for fat white or brown larvae of longicorn beetles. New

tabus have been introduced such as no eating of scaleless fish, flying-foxes, grubs, shellfish and crustaceans. Among Seventh Day Adventists, chewing of betel nut is not allowed.

With the conversion to fundamentalist Christianity, there were great changes. The people of Rennell and Bellona used to wear tapa and were ornately tattooed. They also used to press their noses together in greeting as the Maoris do but this has almost disappeared. Clothes have replaced tapa except during cultural festivals and traditional wrestling or hetakai.

Since the late 1970's, there has been a reaction against the dominance fundamentalist religion has over island life. Many people, especially the young are grateful that the killing and fighting has stopped but regret that so many old traditions have been lost and artefacts destroyed. As a consequence, many Bellonese and some Renellese have deserted the large church-dominated villages and have returned to their traditional lands in small family settlements.



*Houses made of custom materials at Niupani Village on the shore of Lake Tegano. (P.Ryan)*

### 3.2.5 Legends:

Present-day Rennellese and Bellonese consider the Hiti to be the original inhabitants of the islands. They are said to have lived in caves and in the forest. The Hiti were seldom dangerous but played tricks on the newly arrived Polynesians, such as taking their women away. The Hiti could disappear at will, had beautiful gardens, could easily find water on porous Rennell and taught the Polynesians how to cook some plants. They had long hair and were short, light-brownish people with skin as hairy as a flying-fox's. They were gradually eliminated in what the Bellonese call the Hiti Wars. There are still occasional reports of Hiti being seen but most people regard these as dreams or fantasy.

### 3.2.6 Population:

The population on Rennell has never been large, partly because there are only a few small, scattered areas of soil suitable for gardens and because there are limited fresh water sources. The current population is around 1,500 people and this is declining through migration to Honiara and the plantations of the Russell Islands. Despite the migration, the population of Rennell and Bellona is young with 42 percent under 15 years of age (at the last census, 1986). About a third of the population of East Rennell (approximately 500 people) live in the four villages around the lake.

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### 3.3 PRESENT AND PROPOSED USES:

#### 3.3.1 Customary Land Use : Gardens

Village boundaries can be marked in a number of ways ; by trees, ridge lines, special stones or rocks, and by tracks. They are typically 9 kilometres from the village. Most villages claimed areas of around 57 square kilometres and hunting areas, which could be shared with other villages, of around 60 square kilometres.

Most of the land cleared for gardens has secondary growth rather than primary forest on it. Typically, one-quarter of the gardening land is cleared from primary forest. Traditional garden areas are cultivated for around 9 months before being left fallow. The fallow period is around four years when the land will be cleared and replanted.

Each household usually has four garden plots (average size = 328 square metres) or approximately 0.12 hectares under cultivation. The gardens provide a high proportion of the villagers' subsistence food and are cash crops as well. Most gardens are within 2 kilometres of the village but some around the lake edge are much further away (maximum distance of 20 kilometres). The main crops are root vegetables such as kumara (introduced after 1939), taro and pana. Slippery cabbage and pawpaw are also grown. Most villages produce coconuts for sale.



*The taro is being trimmed after it has been harvested. It is the staple food for the people of East Rennell. (P.Ryan)*

Most villages rely on government help and shop foods such as rice when garden food is in short supply, as after a cyclone. The most common emergency foods are wild fruits, kakake (swamp taro), wild yams, coconuts and fish. Pandanus fruit, cycad seeds, coconut crab and birds are also taken but less frequently.

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#### 3.3.2 Wild Food:

Up to thirteen species of birds are taken regularly for food. Other animals taken occasionally for food are coconut crab, flying-fox, and to a lesser degree, pig, goat, other land crabs, tree borer grubs and a species of worm.

All villages harvest marine animals including trochus, beche de mer, clams, turtle and shark. A smaller number of villages take crayfish, dolphin and octopus and a species of seaweed. About 12 species of reef fish are taken but in East Rennell, fewer reef fish species were eaten. Here, fish is a regular part of the diet but it is mostly *Tilapia mozambica* harvested from the lake. The government introduced this species to the lake around 1957 as an additional protein source for the villagers. Since 1990, this rich fishery appears to have declined, probably due to overfishing after fishermen switched to using nets. There are recent reports that catch numbers and fish size is slowly improving.

Most villages use a range of wild yams, taro and pana from the forest as well as roots, ferns, nuts and fruits. There are names for seven varieties of roots, five plants loosely described as "cabbage" and 14 fruits. The roots and fruits are available seasonally.

#### 3.3.3 Water Resources:

Rennell is unusual in the Solomons as it does not have any rivers or streams. The brackish water of Lake Tegano is used for bathing, laundry and cooking.



*Cormorants wrapped in leaves and placed on heated stones in a custom oven. (P.Ryan)*

Drinking water traditionally came from caves, springs and rock pools. All of the villages now have some rainwater tanks but these often run out in the dry season. Some villages also had wells, water holes and springs which were constant throughout the year. Green coconuts are commonly used for drinking, especially when travelling.

### **3.3.4 Forest Use:**

There has been no commercial logging on Rennell but local people have been using portable mills to produce timber for local use. Most villages have an average of two chainsaws. There are no fixed sawmills and three villages make charcoal. A number of the villages cut timber for sale but this is done on an “as needed” basis.

The forest is a storehouse for the villages. It provides thatch for roofing, flooring materials, structural timber, poles and posts, ropes and cane, firewood, food,



*Many of the men are skilled carvers and often have only very basic tools. (P.Ryan)*

medicines, bark for tapa cloth, canoe wood, carving wood and materials for tools, fishing and crafts. Carving wood and game were the least available forest resources.

Flooring, thatching and most of the building materials (except for structural timber), as well as wild foods are less abundant now than in the past. This may be partly due to cyclone damage or it could reflect a longer term trend. Those resources remaining after the cyclone are under increased pressure.

Orchids, butterflies, small animals and reptiles are occasionally taken from the forest and sold. More commonly, coconut crabs are harvested as well as coral and shells. There are no reports of live birds being sold.

### **3.3.5 Employment:**

There are almost no opportunities for waged work on Rennell. Development possibilities are limited due to

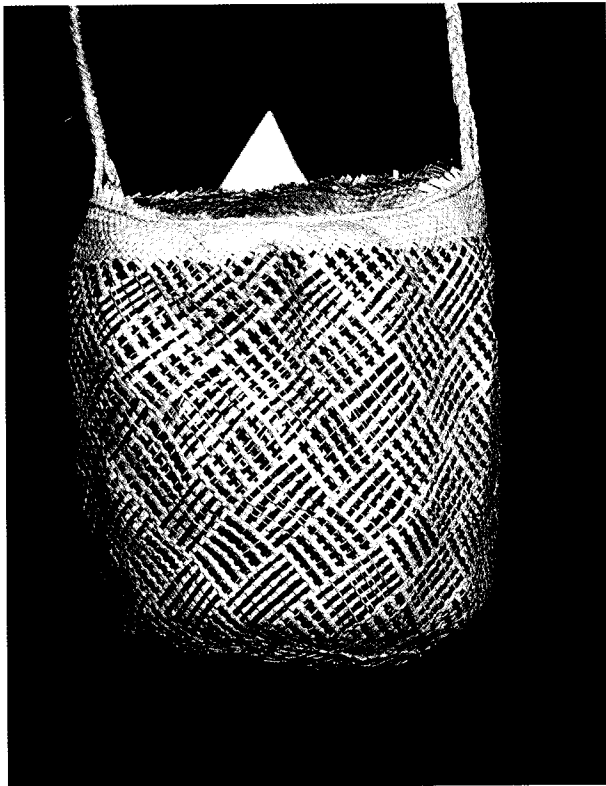
the island’s relative isolation and inaccessibility from the sea which creates problems for exports. However, some resource owners on Rennell have expressed interest in logging if they had control. The potential effects of widespread loss of forest was a concern to many villagers. They felt that environmental problems would be severe, particularly the loss of wildlife and bush materials on which they depend. They knew that gardening would become more difficult because the land would be spoiled by soil erosion and fertility would decline, and also that their water supplies would be disrupted or polluted.

Sustainable small scale logging on East Rennell is possible and will generate some employment from furniture making for local needs and to supply structural timber. A few resource owners were interested in exporting timber from their land but were discouraged when the difficulties of access and transport were explained.

The possibility of mining bauxite from West Rennell was investigated from 1969 until 1977 when mining talks were completed. The people decided not to accept the payment and compensation package that was proposed and for the international company concerned, the economic situation was not viable. The environmental and social impacts of this development would have been considerable. In mid 1969, when prospecting began, road-making machinery and equipment arrived on the island. A road up the steep cliffs at Lavagu was blasted and it was continued north

to the proposed airstrip at Tigoa. Solair was the first company to test the airstrip a few months later.

The road was continued from Lavagu to the lake with assistance from the European Union. This was completed in 1995 but unfortunately, the road stops at the northern tip of the lake and so does not service three of the four lakeside villages. At present, the people of East Rennell travel between Tigoa and the lake on a trailer that is towed by a tractor.



*The young women weave fine baskets from Pandanus and fern. The fern gives the black fibre. (P.Ryan)*

### **3.3.6 Small Businesses:**

On East Rennell there is at least one small local store in each village and at some villages there is petrol or kerosene for sale. Some local people have bee hives and there is potential for a growing honey business as the honey produced is of very high quality. The local people are interested in developing more cash cropping but the problems of limited gardening land and lack of transport will need to be addressed. The men produce carvings and the women weave very fine bags and mats from *Pandanus*. One village near East Rennell had an agency for buying beche de mer and there are two small-scale tourism lodges at Lake Tegano. Nature tourism is seen as a potential earner for East Rennell and there are several small-scale lodges under construction around the lake and at Tigoa, West Rennell near the airfield. Tigoa will also be the administrative centre for Rennell and Bellona when the Provincial Government moves there from Honiara (planned for 1997).

### **3.3.7 Recreation and Tourism:**

There are opportunities for bird-watchers, botanists, photographers, people who like to visit isolated areas or view World War II relics. The outstanding natural beauty of the lake and island, snorkelling, bush walks, cultural activities, seeing village life, and trips by canoe at sea and on the lake, are only a few of the attractions available.



*Tetonga is a master weaver who lives at Tahamatangi on the shores of Lake Tegano. She weaves very fine, high value mats from Pandanus and fern. Currently very few fine weave, large mats are produced as they take too long to make. (R. Greenaway)*

The people are interesting having had relatively recent contact with European Missionaries (late 1930's) and the opening up of East Rennell with the road going through to the lake end in 1995. The society is in transition from being self-sufficient in the past, to the present situation where self-sufficiency, bartering and cash economy are presently, all in use. Although much of the Rennellese culture has been lost, the old people still produce fine weaving, coconut fibre rope and traditional canoes. In all the villages, it is common to see women cooking parcels of food in ground ovens (umu).



### 3.3.8 Sustainable Resource Use:

Customary use in the past has generally provided good stewardship for East Rennell. The exception is in the case of *Tilapia* where nets have been introduced and the fish catch and quality have gone down, probably through overfishing. There is also a need for caution in the harvesting of coconut crabs because these take so long to reach maturity. With the road and airport, it is now easy to market these crabs and their value is high. Harvesting limits need to be established.

Wild foods such as birds are commonly part of the diet. Unfortunately, they are now being taken in greater numbers than before as some village people have firearms. In the past, birds were caught using snares and slings. There need to be controls on the number and use of firearms at East Rennell. Sustainable harvesting of *Tilapia*, coconut crabs and birds will be addressed in the East Rennell Resource Management Plan (see 5.5.v).

### 3.3.9 Future Uses of the Nominated Area:

It is intended that the nominated area shall be managed for its wilderness values with increased ecotourism and associated services. Other sustainable businesses that will provide income generating opportunities for village people are being investigated. These small businesses must be compatible with World Heritage ideals and, currently, bee-keeping and marketing of local crafts are being supported.

### 3.4 MAPS:

Map 2 outlines the nomination area.

### 3.5 PHOTOGRAPHIC AND CINEMATOGRAPHIC DOCUMENTATION:

Photographs illustrating important features of the nomination are placed in the text. Videos and film documentaries outlining characteristics of the nomination area are listed in appendix F.

### 3.6 BIBLIOGRAPHY:

A list of the important references relevant to this nomination are given in the text or are given in appendix G.

## 4.0 STATE OF PRESERVATION / CONSERVATION

### 4.1 Present Condition:

Rennell is isolated geographically from Guadalcanal (180 km to the south). It is sparsely populated and is characterised by untouched rain forest and Lake Tegano. Small planes (Twin Otter) operated by Solair fly to Rennell three times a week and can take 18 passengers. A cargo ship that also takes passengers sails approximately once a month. The primary goal of resource management for East Rennell is to maintain the natural character of the reefs, forests and Lake Tegano.

Very few areas have been modified by logging and shifting cultivation. Those areas that have are close to villages and provide land for gardens. With the extension of the road in 1995 from Lavagu to the lake end, timber trees were removed from both sides of the road. Much of this timber has been used for rebuilding houses after cyclone Nina.

Following cyclone Nina many mature trees were blown down and have created gaps in the forest canopy. This has led to increased growth of a vine, *Meremia peltata* (local name = Sopi'atua). This needs conditions of full sunlight and so is prolific at the road margins along the extension. It is smothering isolated trees and appears to be degrading the forest but is part of the cycle of forest regrowth.



The vine, *Meremia peltata* (local name = *Sopi'atua*) is abundant where there has been canopy damage after cyclone Nina in 1993. (R. Greenaway)

There is one main road which has a crushed coral surface and runs from Tigoa in West Rennell to the lake at East Rennell. There are walking tracks to the coast at various places in East Rennell. Other transport is by canoe around the open coast and on the lake.

There is no wharf on Rennell. Ships and barges anchor at Lavagu Bay for East Rennell and cargo is taken past the reef by canoes. This has protected the island so far from the introduction of the Norwegian or ship rat (*Rattus norvegicus*) which is an aggressive predator of nestlings and birds eggs and would have a major impact

on the bird population (this is addressed later in section 5.5.iv).

Mammals have been introduced to the island and some have become feral e.g. pigs and goats. They do not appear to be in large numbers. Some households have cats and education is needed so that they do not become a problem. The Pacific Rat (*Rattus exulans*) is on Rennell and Bellona. From archaeological records, it arrived in Melanesia approximately 3 500 years ago and spread with humans throughout Polynesia.

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There is no documentation about exotic weeds on Rennell. A visit by staff from the Herbarium is planned to document these.

#### **4.2 Agents Responsible for Preservation / Conservation:**

The Ministry of Forests, Environment and Conservation will be responsible for reviews of the Resource Management Plan for East Rennell which covers the nominated area. The purpose and function of the resource management plan will be explained by Ministry staff and they will also assist with implementation of the plan and give advice as required. Locally the Tegano Management and Conservation Committee will play an important role in establishing the rights of resource owners and users to harvest natural resources and in screening small business applications to see if they are sustainable and meet World Heritage principles. Problems will be referred to the Council of Chiefs and Paramount Chief to be resolved. If the problem continues, an enforcement officer from the appropriate Ministry would be asked to intervene.

The Ministry for Culture, Tourism and Aviation will be responsible for reviews that involve ecotourism and small business development. The Ministries will work within local structures e.g. the Council of Chiefs, the relevant Provincial Government committees and the Tegano Management and Conservation Committee.



*A few traditional outrigger canoes can still be seen on the lake although dugouts are more common. Gradually the number of fibreglass canoes is increasing. (P.Ryan)*

### **4.3 Means for Preservation / Conservation:**

The people of East Rennell are the land and resource owners. Their desire to have East Rennell listed as a World Heritage area has involved their participation in a public awareness programme to explain what World Heritage is, the advantages and disadvantages of listing and how becoming a World Heritage area will affect them. The people have helped to prepare a draft resource management plan with input from the Tegano Management and Conservation Committee, the provincial members, the Council of Chiefs and the Paramount Chief. This is in preparation and will be circulated and revised to form the East Rennell Resource Management Plan. The local peoples' understanding of environmental matters and desire to generate income through ecotourism are all factors that work together to give protection to the area.

#### **4.3.1 Legislation:**

There are many statutes that actually or potentially affect the management of the nominated area. Within the Solomons, there are a number of sources of law : the statutes of National Parliament ; the Ordinances passed under devolved power in the Provinces; by-laws of Area and Town Councils; the applicable legislation of the British Parliament; the common law and principles of equity derived from the United Kingdom; the rules of precedent developed in the Solomons; and customary law. Details of legislation with relevance to East Rennell are given in appendix E.

## **5. JUSTIFICATION FOR INCLUSION IN THE WORLD HERITAGE LIST (Natural Heritage property)**

### **OUTSTANDING UNIVERSAL VALUE :**

The following are quotes about Rennell that support the issue of “outstanding universal value” of the nominated area.

1. Rennell is listed in the only attempt made by the International Union for the Conservation of Nature (IUCN) at preparing an indicative list of potential natural World Heritage Sites. The inclusion of Swedish Lapland on that list was used by Sweden in 1996 to justify the nomination of Swedish Lapland and it was recommended by the World Heritage Bureau for listing.
2. Rennell is listed in the following authoritative IUCN publications as a special place:

*The World's Greatest Natural Areas - an indicative list of natural sites of World Heritage quality* (IUCN / CNPPA, 1982) includes Rennell Island with the following justification:

*The island is of outstanding geological, biological, and scenic value; it includes the world's largest raised coral atoll; one of the Pacific's largest lakes (the former lagoon, now home to sea snakes and possibly unique in that respect among lakes); home of numerous endemic bird taxa; and one of the westernmost islands colonised by Polynesians.*

*Review of the Protected Areas System in Oceania* by Arthur L. Dahl (IUCN / UNEP, 1986) ranked Rennell as close to Henderson Island in the Pitcairn Group (already a World Heritage Site) for its overall conservation importance. Among raised coral atolls, Dahl ranks Rennell second after Guam. It has been stated by the Protected Areas Data Unit of the World Conservation Monitoring Centre (WCMC), Cambridge, United Kingdom that Dahl's numerical ranking system puts Rennell second to Guam by only a single point and comments that if “the severe development pressures and the impact of introduced predators in Guam” are taken into account, “Rennell could be a clear winner”.

*Coral Reefs of the World, Volume 3*. Central and Eastern Pacific (UNEP / IUCN , 1988) describes Rennell as the largest uplifted atoll in the world with the largest lake in the Pacific Islands and says it has a forested ecosystem which is home to many species of plants and animals including orchids, birds and a lake snake. It adds that Rennell has a number of endemic bird species and subspecies. It says that Rennell is culturally significant in being one of the further west islands of the Pacific colonised by the Polynesians.

*IUCN Directory of Protected Areas in Oceania* compiled by the WCMC in collaboration with the IUCN Commission on National Parks and Protected Areas and the South Pacific Regional Environment Programme (IUCN - The World Conservation Union, 1991) in discussing the Solomon Islands cites *The Atlas of Tropical Forests : Asia and the Pacific* prepared by the

IUCN and WCMC (Ed. by N.M. Collins, J.A. Sayer and T.C. Whitmore, Macmillan Press, London 1991) as saying that Rennell is a “critically important site...”

3. In the paper “*Which oceanic islands merit World Heritage status ? A short feasibility study for IUCN - The World Conservation Union*” (1991) by H. Synge, he suggests that as a measure of biological diversity on islands, the following should be considered : endemic birds, endemic plants, coral reefs and as a breeding ground for marine vertebrates. He also recommends that :” if an island site had more than three endemic birds, it would be worthy of World Heritage status on that ground alone”. For plants he suggests that :”if an island had 5 - 50 endemic plants, it would provide a strong supporting argument to inscription under other criteria”. With regard to coral reefs :”it would also be possible to draw up some criteria for what constitutes an “exceptional” reef - features such as size, isolation, the extent to which it is pristine - come to mind as well as biological diversity and endemism”. Clearly there is a strong case for World Heritage listing of the East Rennell area.

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**5.1 Criterion (i) : “ Sites nominated should be outstanding examples representing major stages of earth’s history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features “**

5.1.1 The formation of Rennell is a product of the Pleistocene and post-Pleistocene sea-level changes which led to a massive coral building phase in the earth’s history,

5.1.2 Rennell is an outstanding example of an up-raised coral atoll. It has been uplifted at least five- times and is presently in an uplift phase,

5.1.3 Lake Tegano on Rennell is the largest lake in the South Pacific (excluding Australia and New Zealand).

**Pleistocene Coral Building:**

The Solomon Islands are purely oceanic in origin ; there is no evidence that pieces of older continents exist there. The basement rocks of Rennell and Bellona were formed along a spreading mid-ocean ridge sometime between the late Cretaceous and early Eocene (around 66 to 58 million years ago). At about early Eocene time, a convergent plate boundary formed in the vicinity of Rennell and Bellona.

Near the end of the Pliocene (around 1.6 million years ago), tectonic movements raised the sea bed sufficiently

to allow coral building on Rennell, Bellona and the Indispensable Reefs. These areas form part of the Bellona - Rennell Bank. During the Pleistocene and post-Pleistocene age (1.6 million years ago to the present), intensive coral formation occurred, helped initially by the movement up of sea water into and out of the polar ice caps causing world wide fluctuations in sea level. The coral atolls of Rennell and Bellona were formed in this way.

**Tectonics and Uplift Events:**

The thickness of the sedimentary pile above basement on the Rennell Ridge is at least 500 metres. It is likely that this thickness of reef deposits could only form on a slowly subsiding basement platform. The uppermost reefs have been the least eroded and have the steepest sides indicating that the upper reef is the youngest. During periods of stable sea level, or only slow subsidence, extensive corallgal growth took place on the Rennell Ridge and the typical atoll reef profile developed with a fore reef and behind it, a wide reef flat. A change in conditions resulted in the cessation of growth on the fore reef, its submergence, and then the formation of a new fore reef within the old reef flat region.

As subsidence continued, the submergence of the outer reefs was accompanied by a decrease in width of the inner reef zone. This resulted in the lagoon becoming progressively less sheltered and eventually in open sea conditions on either side of the reef complex. The final

stage of reef growth before complete submergence of the atoll was narrow and precipitous, and forms the present rim.

Rennell and Bellona are atolls that are built on a structurally-aligned crustal plate (not on a volcanic pile). In the early stages of formation, there was crustal anticlinal folding, and in more recent times, there has been pulsating vertical uplift of the sea bed on the southern side of the submarine trench which runs in parallel to the south west side of the Solomon Islands. There have been at least five uplift events and these can be seen in the terraces indicating former sea levels on the cliffs of Rennell and Bellona. The Rennell Ridge on which Rennell and Bellona are situated is presently in a phase of active uplift following a long history of subsidence.

**Lake Tegano:**

Lake Tegano is contained in the central basin of Rennell which was the old lagoon. It is 29 kilometres long and 10 kilometres wide (maximum dimensions) with an area of 155 square kilometres. The lake occupies 17.6 percent of the entire area of Rennell and is the largest body of enclosed water in the insular Pacific. The central part of Lake Tegano forms a nearly unbroken plain with a depth rarely greater than 40 metres and a maximum depth of 43 metres. The lake is brackish and has low salinity water. This is maintained by a subterranean duct system which connects the lake with the sea.

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**5.2 Criterion (ii) : “ Sites nominated should be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals “**

5.2.1 Rennell is known internationally because it illustrates very clearly the theory of island biogeography and speciation especially in its birdlife,

5.2.2 The fauna of Rennell has been collected and studied by a number of scientific expeditions and some groups exhibit high endemism,

5.2.3 The flora of Rennell is unique in its composition and represents a young and isolated atoll flora.

5.2.4 The flora of Rennell has some endemics species and more are likely to be found by specialist collections.

**Biogeography, Speciation and Endemism: Avifauna**

With the exception of Papua New Guinea, the Solomon Islands have a greater diversity of animal species and a higher level of endemism than any other Pacific island nation. Within the Solomon Islands, Rennell has the highest occurrence of endemism for an island of its' size.

Rennell has 43 breeding land and fresh-water bird taxa, of which four species are endemic to Rennell, nine are



*Lake Tegano is the largest body of enclosed water in the insular Pacific. (R. Greenaway)*

subspecies endemic to Rennell and seven are subspecies endemic to Rennell and Bellona. The proportion of taxa endemic to Rennell and / or Bellona (47 percent) is extremely high.

The percentage of endemic taxa on Pacific islands increases with island area and isolation because development of an endemic taxon requires that a colonist population survive long enough to differentiate.

On small islands near colonisation sources, colonists arrive too often and disappear too quickly to differentiate. Rennell has evolved its famous endemics because it is by far the largest out-lying island in the Solomons. Bellona is poor in endemics because it is too small for populations to survive in isolation for long.

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## Speciation and Endemism : bats, krait, land snails and insects

Rennell has eleven species of bats and they are the only indigenous terrestrial mammals. There is one endemic bat species, the Rennell Flying-fox, and there are two endemic subspecies, the Diadem Horseshoe-bat and the Large-eared Sheathtail-bat (27 percent endemism). The Rennell Flying-fox is a large, fruit-eating bat and it is important in spreading the seeds of trees. The other bat species feed on insects.

The endemic sea krait, *Laticauda crockeri*, is one of two records for the world of a sea snake living in an almost freshwater lake. It is thought to have evolved in isolation in one of the periods when Lake Tegano became cut off from the sea.

Rennell has a rich land snail fauna of 27 species. Seven species are endemic and two species are found only on Rennell and Bellona (33 percent endemism). There is an endemic genus, *Quirosella* (Ariophantidae) which has three species. The three species can occur separately or together.

A total of 731 insects have been identified from the collections made at Rennell and Bellona. They are largely moths and beetles (253 and 180 species) and have 31 and 25 percent endemism respectively. This fairly high level of endemism is likely to be reduced when neighbouring islands and island groups are more

intensively studied. By 1991, most of the earlier scientific collections had been studied and within the Order : Insecta, 13 genera and 2 subgenera were endemic to Rennell.

The origin, comparative isolation and different ecological environments of the two raised atolls of Rennell and Bellona (in contrast to volcanically-built larger islands to the north) must certainly generate a higher level of endemism than in other, similar sized islands of the Solomons.

### Unique Flora:

Many of the common canopy tree species on Rennell are uncommon elsewhere in the Solomons. Conversely, those trees that are common elsewhere in the Solomons are absent from Rennell. There are a number of factors, both physical and biogeographical, that have contributed to the unusual composition of the Rennell forest (Wright & Schenk). They are :

1. The uniform geology and geomorphology of Rennell which may have reduced opportunities for colonisation and / or the survival of tree species that are common in the more varied landscapes of the large islands in the Solomons.
2. The relative youth of Rennell compared to the other large islands in the Solomons which may have precluded colonisation of common but slow-to-colonise tree species.

3. Regular cyclone disturbance and lack of hills and valleys may keep the forest at an early successional stage compared to forests growing in sheltered positions on other islands. This would restrict occupancy on Rennell of climax species which are common elsewhere in the Solomons.

4. The limestone-derived soil is deficient in available potassium and this may be a limiting factor for some species.

After considering what is known of the flora of Rennell, many questions arise. Botanists and biogeographers could study the species composition of atoll floras in relation to : soils, age, cyclone disturbance, size, topography and location of the nearest landmass as a colonisation source.

### Floral Endemics;

To date, no endemic tree species have been found on Rennell but there are a total of nine endemic vascular plants and one endemic fungus (see section 3.1.5). A high degree of endemism in the flora would be unusual considering the lack of diversity of habitats on Rennell and the “youth” of the atoll, but it is likely that more endemics will be found as specialist collections are made.



**5.3 Criterion (iii) : “ Sites nominated should contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance “**

**Natural Beauty:**

Rennell is a stunningly beautiful island covered with lush tropical rainforest from coast to coast and circled with limestone cliffs that fall sheer to the sea. A narrow fringing reef is covered with clear waters that drop away



*Lake Tegano and some islands at sunset. (P.Ryan)*

to the depths. Lake Tegano covers approximately one fifth of the island and has around 200 small, forested islands at its' northern end.

For its size, Rennell is probably the least environmentally disturbed island in the South Pacific. Human impact is slight. There are five villages at East Rennell with housing that is a combination of western and custom materials.

**5.4 Criterion (iv) : “ Sites nominated should contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation “**

Rennell is the only location for a number of bird, animal and plant species. In its entirety, Rennell is unique because of its formation, isolation and the speciation that has occurred there. It has also been fortunate in its lack of disturbance by man.

Some of the more important endemic floral and faunal species are listed below :

- The Rennell Fantail (Magighape) is a moderately common forest bird and is very tame.
- The Rennell Shrikebill (Ghoghoviu) is given in the Red Data Book as rare or endangered. It is commonly seen throughout the forest.

- The Rennell White-eye (Susuvaagu) is quite commonly seen in forest and overgrown gardens in West Rennell. It is uncommon at East Rennell.
- Woodford's White-eye (Ghagha) is a very common bird both in forest and near gardens and is often seen feeding in groups.
- Rennell Starling (Ghapilu mouku) is an endemic species found on Rennell and Bellona. It is a moderately common forest bird but it is more frequently seen in gardens and secondary forest.
- Rennell Flying-fox (Langa) is a large, fruit-eating bat that is important in spreading the seeds of trees. It is considered vulnerable or endangered. It is known from only five specimens and the two most recently collected (in 1962 and 1965) came from East Rennell.
- *Laticauda crockeri* (Tugihono'ugi) is a dwarf sea krait endemic to Lake Tegano where it is common. It is one of only two species of sea snake in the world that have evolved to live in an almost freshwater lake.
- *Dendrobium rennellii* is a rare and beautiful endemic orchid which is found only on some islands in Lake Tegano.

**5.5 Integrity and Summary:**

East Rennell fulfills the conditions of integrity :

- i. The five times uplifted coral atoll formation is clearly visible, as are the former reef crests and flats. Lake Tegano, which is situated at East Rennell,

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occupies the central plateau in what was the old lagoon floor.

ii. The East Rennell World Heritage area comprises Lake Tegano, the lake islands, the forests, the surrounding reefs and the sea out to three nautical miles. This will provide protection for the unique species of animals and plants associated with the coast, lake and forest and also for the catchment area that drains into the lake.

The marine and land area extends northwest to the Provincial Boundary between wards two and three. It includes all of the forest types described for Rennell : interior basin, lake margin and karst ridge forest.

iii. The whole island of Rennell is beautiful with its cover of lush vegetation from coast to coast. At the moment there are no large scale development plans being considered that would seriously alter the landscape values of Rennell.

Lake Tegano at East Rennell is being considered for small scale ecotourism developments and if these are carefully planned, the aesthetic and landscape values of the lake and islands should not be degraded.

The dramatic beauty of the forested limestone cliffs that drop steeply to the reefs that encircle all of Rennell are not currently under threat. The reefs at the base of these cliffs are harvested by the Rennellese and access to them is difficult and weather dependant in many places.

iv. All the habitats required for maintaining the diverse flora and fauna of East Rennell are contained in

the proposed World Heritage area. It should be mentioned that with such a rich bird fauna, care must be taken to prevent extinctions. The most devastating introduction to Rennell would be that of ship rats which on other islands lacking mammalian predators have caused the loss of many bird species. At present there are no wharves on Rennell which prevents rats coming ashore from visiting ships. If a wharf is built in the future, it should be designed with the prevention of rat introduction in mind.

v. **Resource Management Plan.** Surveys are underway with the four villages in the area to record the traditional use of natural resources in the forest, the lake and the sea. Customary practices have provided protection to the area in the past and these practices will form the basis of the Resource Management Plan.

A Resource Management Plan will be developed in consultation with the resource owners, the Tegano Management and Conservation Committee, the Provincial Members, the Council of Chiefs and the Paramount Chief. A draft plan for the area will be circulated and revised to form the overall management plan for East Rennell. The purpose and function of the plan and its implementation will be explained and supervised by staff from the Ministry of Forests, Environment and Conservation. It is hoped to have the first draft of the Resource Management Plan completed by June 1997.

The East Rennell Resource Management Plan will be the most important document for protection of natural

resources. When it is approved by the Paramount Chief and Council of Chiefs it will have the status of other customary laws. For repeat offenders or people ignoring customary practices, it may be necessary to arrange for visits to be made by Ministry enforcement officers followed by confiscations and fines as given in existing national legislation.

vi. **Long-term legislative protection** for East Rennell will be given under the Solomon Islands World Heritage Cultural and Natural Sites Act. This is currently being redrafted at the Solicitor Generals Office. It is unknown how long it will take to proceed through to legislation. This Act protects natural and cultural sites and specifies that all natural resource harvesting must be sustainable and there are penalties if there is wilful disregard of this. It would provide further reinforcement to the customary and national laws that are already in operation and would apply specifically to areas that are listed as World Heritage Sites.

The boundaries of the East Rennell nomination area have been determined by the Paramount Chief and Council of Chiefs from East and West Rennell. The boundaries are surveyed and are used by the Provincial Government and are not the same as the customary land boundaries.

The nominated East Rennell area has the qualities of outstanding universal value which justify listing and the mechanisms in place and being put in place are considered to fulfil the Conditions of Integrity and, therefore, it is being submitted by the State Party for

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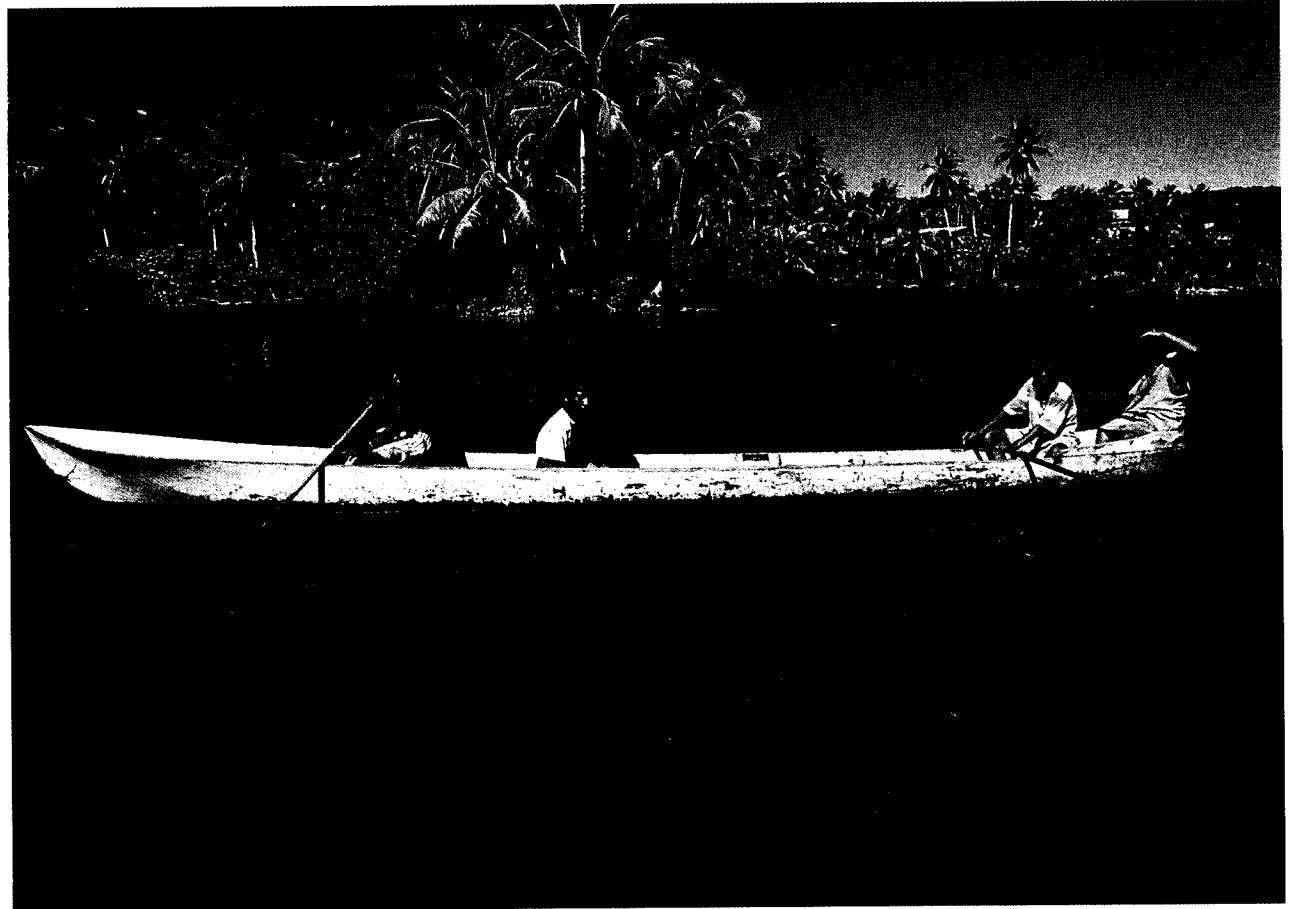
inscription on the World Heritage List at this time. It would be desirable in terms of forested land area available for the protection of bird and animal species, if all of Rennell were to be included in the World Heritage Area.

This is more likely to be achievable as the people of West Rennell see the successful implementation of World Heritage status over East Rennell as an option which the State Party may consider for the future.

vii. **Participation of local people** and ownership of the World Heritage concept. Since 1994 there has been a World Heritage Public Awareness and Education Programme which has sought to inform the local people of the advantages and disadvantages of becoming a World Heritage Site. Recently a video of the East Rennell area has been made and it shows why it is special to the world. A video player and generator was hired in each village so that the local people could view the video. They are a visual society and the video made a big impression sometimes being played four times consecutively.

Separate meetings were held for the men and women at each village in April 1997 to ask if they wanted to continue with the World Heritage nomination process. There was a high level of support, estimated at 80 % of the adult population.

The people requested assistance to manage their resources sustainably and this is being addressed through the Resource Management Plan. They would also like assistance with small business development.



*During World War Two the Americans had a small airforce base at Tigoa, East Rennell. Not all of the planes made it back. This Catalina flying boat lies in shallow water close to Hutuna Village, East Rennell. (R. Greenaway)*

The Solomon Island and New Zealand Governments have agreed to this through the bilateral programme. A Small Business Development Plan will be produced and will consider businesses that are small-scale, environmentally friendly and sustainable.

viii. **Social Impact.** Participatory Rural Appraisal Surveys (PRA) have been undertaken at three of the four villages and it is hoped that the remaining village will be surveyed later this year. The purpose of the surveys was to establish baseline data on the current lifestyle and it is intended that the surveys will be repeated in two to three years time to monitor the impacts and review the changes.

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## APPENDICES :

### A : Geology and Landforms - General

The basement rocks of most of the islands in the Solomons were formed along a spreading mid-ocean ridge sometime between the late Cretaceous and early Eocene. Around the early Eocene, a convergent plate boundary formed in the vicinity of Rennell and Bellona, to the south of the main Solomons chain. By the Oligocene (around 44 million years ago) this had led to metamorphism and uplift in the northern part of the Solomon Islands arc (Choiseul, Santa Isabel, Florida Islands). By the Oligocene, volcanic activity and uplift was occurring in the area of San Cristobal, Guadalcanal and Bougainville. By the early Miocene, 25 million years ago, volcanic activity had ceased and limestones laid down in shallow waters are found on all these islands. Volcanic activity began again by around seven million years ago, accompanied by uplift. Guadalcanal and Bougainville may have reached their present extent and elevation during this time. Also at this time, the volcanoes of New Georgia and other areas in present-day Western Province came into existence. These landmasses are much more recent than the rest of the group.

During glacial maxima over the past two million years, various of the Solomon Islands have been connected. Perhaps the most important is the landmass named Greater Bukida. It includes all islands between Buka and the Floridas, which would have been joined when

sea-level dropped by over 100 metres. Similarly, many of the islands of present-day Western Province would have been joined into two landmasses at these times, although they would have been isolated from all other land masses. Guadalcanal, Malaita and San Cristobal would have been joined to small adjacent islands, but remained isolated from each other and other major landmasses. Greater Bukida and Guadalcanal would have been separated at most by only a few kilometres during these times.

#### (i) Geology of Rennell and Bellona :

The uppermost reefs of Rennell and Bellona have been the least eroded and have the steepest sides, indicating that the uppermost reef is the youngest. During periods of stable sea level, or only slow subsidence, extensive coralgall growth took place on the Rennell Ridge and the typical atoll reef profile developed with a fore reef and behind this, a wide reef flat. A change in conditions resulted in the cessation of growth on the fore reef, its submergence and the formation of a new fore reef within the old reef flat region.

As subsidence continued, the submergence of the outer reefs was accompanied by a decrease in width of the inner reef zone. This resulted in the lagoon becoming progressively less sheltered and eventually in open sea conditions on either side of the reef complex. The final stage of reef growth before complete submergence of the atoll was narrow and precipitous and forms the present rim.

Atypical conditions prevailed during the formation of the atoll reefs of Rennell. The Tigoa borehole at West Rennell failed to penetrate the limestone basement at a depth of 75 metres, indicating that the depth of water in the lagoon when reef building began was probably in excess of 270 metres. Depths of about 83 metres are typical of lagoons within the Bismarck Archipelago.

The major factor in the formation of the Rennell reef complex was instability of the underlying basement ridges. The succession of now-elevated reefs is probably the result of relatively rapid changes in sea level related to both eustatic (sea level) changes and tectonic factors (subsidence and uplift).

#### (ii) Dolomitization

Dolomitization is the formation of calcium and magnesium carbonate from calcite (calcium carbonate) which reacts with solutions of magnesium carbonate in seawater or groundwater. It can be precipitated directly from water and is removed from seawater by organisms to make their shells.

It is probable that the Rennell reefs were initially deposited with a high concentration of magnesium already included in the coralline algae and that the dolomitization is early diagenetic in character. The extra magnesium required may have been bioconcentrated by organisms and incorporated directly as high magnesium calcite and dolomite within the algae or included in interstitial waters. Recrystallization to microcrystalline dolomite has since taken place. The fine-grained white

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dolomite of Rennell is thought to have originated this way. The buff granoblastic dolomite is derived from extensive recrystallization that accompanies the slow downward movement of the water table during the uplift phase. The textural differences between the two types of dolomite found on Rennell are a direct consequence of their post-depositional history.

## **B : Soil Details**

Generally, tropical forest soil profiles have three main strata. At the surface, an “organic mat” of fallen leaves offers protection from raindrop impact for the mineral soil below and acts as a sponge that promotes infiltration. This mat, as it decomposes, is an important nutrient store. The “topsoil”, which is usually about 30 cm deep, is friable, quite strongly structured and permeable with good levels of calcium and magnesium but low levels of potassium and phosphorus. The “subsoil” is usually acidic, heavy clay with less structure and low permeability. Nutrient levels here are very low and the clay complex is dominated by aluminium. Under tropical forest, nutrient cycling is important in maintaining soil fertility. If the forests are cleared, nutrient levels are often too low to sustain subsistence agriculture.

Soil surveys of bauxitic and phosphatic soils have been made on Rennell and Bellona. High grade phosphates of alumina and iron oxides were found in Bellona soils and high grade (low silica) bauxite deposits were found on Rennell. Three surface soil samples from Rennell that

were collected for agronomic purposes were deficient in available potassium but high in phosphorous and sodium.

Three soil groups have been identified on Rennell (using USDA soil classification system). The karst ridges and etched limestones of the island’s upraised margins support shallow, freely drained, stony dark brown clays (rendolls) and reddish brown soils with very friable organic material (tropofolists). The interior basin of the island also contains tropofolists and rendolls as well as strongly weathered, deep, free draining dark brown to reddish brown clays with a high base saturation (euthrothrox). Below this euthrothrox layer lies a strongly weathered bauxite clay with a low percentage of exchangeable cations and a moderate base saturation.

The soils had a typical pH range of from 6 at 1 cm depth to 8.5 at 6 cm, high available phosphorous and calcium levels, moderate nitrogen levels and extremely low levels of available potassium (even though substantial potassium concentrations are present in the soil). This is normal for Pacific atoll soils where available potassium levels are often very low while phosphorous is usually in moderate supply. Also, the trace nutrients such as iron, manganese and zinc can be rendered unavailable to plants in atoll soils by prevailing alkaline conditions such as those recorded for Rennell. The capacity for soil moisture retention is often low on atolls and consequently plants may be periodically subjected to water stress.

On Rennell, four environmental domains have been identified based on land systems which are areas of similar geology, landforms, soils and vegetation.

The uplifted reef domain includes the central “saucer shaped” areas of Rennell and is represented by the Hatagua land system. It consists of low limestone outcrops separated by depressions filled with bauxitic soils. The land system lies mainly between 0 -15 metres. The drainage is subterranean.

The outer rim domain consists of the Baeroko land system and almost completely encloses the Hatagua land system. Slopes are steep on the seaward margin while on the inner margin the rim descends in a series of steps. The ground surface is very irregular with limestone pinnacles, collapsed caverns and solution hollows forming significant features in the landscape.

The swamp domain is characterised by the Pusuraghi land system. This domain comprises large, forest covered freshwater swamps with deep peats and poor clay soils. On Rennell there are about five major areas, some of which are cultivated for swamp taro (*Colocasia esculenta* and *Cyrtosperma chamissonis*). Some of the swamps have herbaceous plants.

At the eastern end of Rennell is the lake domain. Some of the small islands in the lake have been cleared for coconuts. The narrow rim around the lake is mostly covered with tall forest which has had little human impact.

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## **C : Vegetation - Forest Types on Rennell :**

### **Interior Basin Forest :**

The most widely occurring forest association on Rennell is a tropical lowland evergreen rain forest which covers the interior basin of the island. The average height of the island interior forest canopy is around 20m with scattered emergent fig trees (*Ficus*) to 30m. Trees other than *Ficus* rarely exceed a girth of 1.5m. Plank buttresses are common and canopy closure is approximately 70-80 %. Frequent canopy openings allow substantial light penetration into the lower forest levels and result in abundant epiphytes. Small-stemmed lianas and at least two species of palm (a rattan, *Calamus* sp., and an endemic erect understory form, *Drymophloeus* sp. nov.) are present.

The forest floor associations show a number of features typical of the lower montane zone in the Malesian tropics. Malesia is a phytogeographical region that stretches from the isthmus of Kra in south peninsular Thailand, throughout the Malay archipelago to the Bismarck archipelago northeast of Papua New Guinea. These associations include an abundance of ground ferns, small leaved herbs, mosses and liverworts and nest epiphytes (*Asplenium* sp.). Elsewhere tree ferns are a feature of this zone but they are absent from Rennell.

### **Forest of Lake Tegano Margin:**

The forest contains tree species typical of the widespread mangrove and beach forest floras typical of the tropical Indo-Pacific strand flora. The two common mangrove species are *Bruguiera gymnorhiza* (Rhizophoraceae) (local name = Tongo) and *Lumnitzera littorea* (Combretaceae) (local name = Sangage). *Pandanus*, is a conspicuous element of the lake margin flora. Some of the species in this forest (e.g. the mangroves) have seeds that are normally dispersed by sea. It is possible that seeds have entered the lake by the subterranean channels that connect to the sea or they may be derived from strand flora that has been trapped by the island's uplift.

### **Forest of the Karst Ridge:**

This forest has similarities in terms of composition and structure to both heath and upper montane Malesian forest subforms. It is confined to ridge crests and steeply sloping terraces where periodic moisture stress, wind pruning, aerial salt deposition and skeletal soils are important environmental influences. Typical canopy closure is 50 - 60 % for forest on the karst ridge. Where wind damage has opened the canopy, abundant orchids and ferns can be found at ground level. The maximum height of the canopy is around 4m and stem girth is seldom greater than 0.5m. Spindly, gnarled trees are common. Reduced leaf size, increased thickness and / or toughness and waxy surfaces are all features common to tree leaves in this forest. The cycad, *Cycas rumphii* (Cycadaceae) (local name = Paipai) is commonly seen.

## D : Fauna : Origin of the Avifauna

From the relationships of the Rennell species to species elsewhere, the origins of the 43 breeding species have been deduced. Fourteen species probably arrived from the Solomons because the equivalent race on Rennell is widespread in the Solomons, but the species is absent in Vanuatu. These are listed :

Scientific Name	Common Name	Rennell Name
<i>Pandion haliaetus melvillensis</i>	Osprey	Magibae
<i>Haliaetus sanfordi</i>	Sanford's Eagle	Kapakaumaahiti
<i>Ixobrychus flavicollis woodfordi</i>	Black Bittern	Ghou
<i>Gallicolumba beccarii solomonensis</i>	Grey-throated Ground Dove	Tuu
<i>Lorius chlorocercus</i>	Yellow-bibbed Lory	Sibigi
<i>Micropsitta finschii finschii</i>	Pigmy Parrot	Ghinei
<i>Collocalia vanikorensis lugubris</i>	Vanikoro Swiftlet	Pekapeka
<i>Hemiprocne mystacea woodfordiana</i>	Whiskered Tree Swift	Baapenuenu
<i>Aplonis cantoroides</i>	Singing Starling	Ghaapilu-ghae

For other species, the Rennell race is widespread in the Solomons, as with the following species:

<i>Tyto alba crassirostris</i>	Barn Owl	Gugu
<i>Pachycephala pectoralis feminina</i>	Golden Whistler	Taataga
<i>Geoffroyus heteroclitus hyacinthus</i>	Song Parrot	Ghisua
<i>Zosterops rennelliana</i>	Rennell White-eye	Suusubagu
<i>Coracina lineata gracilis</i>	Yellow-eyed Greybird	Ligobai

Three species could have arrived from the Solomons or Vanuatu because the Rennell race occurs in both the Solomons and Vanuatu. An example is ;

<i>Macropygia mackinlayi arossi</i>	Rufous-brown Pheasant Dove	Katogua
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or else it is endemic but related to both Solomon races and Vanuatu races such as ;

<i>Collocalia esculenta desiderata</i>	Glossy Swiftlet	Pekapeka
<i>Turdus poliocephalus rennellianus</i>	Island Thrush	Gagango

Four species with endemic Rennell races arrived from the east or south east (Santa Cruz, Vanuatu, New Caledonia) because the most similar races are in the Vanuatu and Santa Cruz,

<i>Halycon chloris amoena</i>	White-collared Kingfisher	Ligho
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or, because the species is absent from Australia and the Solomons and otherwise occurs only to the east and south east ; such as

<i>Gerygone flavolateralis citrina</i>	Fantail Warbler	Lokeloke
<i>Myiagra caledonica occidentalis</i>	Broad-billed Flycatcher	Tangitangibiilage

or, because the same is true except for a population in the easternmost Solomons ;

<i>Myzomela cardinalis sanfordi</i>	Cardinal Honey-eater	Baghigho
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Two of the endemic species of Rennell probably similarly arrived from the east because the only close relative of each is on Santa Cruz (plus Fiji in the case of *Clytorhynchus*).

They are ;

<i>Clytorhynchus hamlini</i>	Rennell Shrikebill	Ghoghobiu
<i>Woodfordia superciliosa</i>	Woodford's White-eye	Ghagha

Two endemic races belong to species absent from the Solomons but with other races in Vanuatu and Australia. They may have arrived from Australia directly or else via the Vanuatu population ultimately derived from Australia. They are ;

*Tachybaptus novaehollandiae rennellianus* Australian Dabchick Manusigi

*Chrysococcyx lucidus harterti* Shining Cuckoo Tangionge

Four Rennell populations probably arrived directly from Australia because they belong to species widespread in Australia and with very restricted distributions in Vanuatu and / or Papua New Guinea. They are ;

*Threskiornis moluccus pygmaeus* White Ibis Taghoa

*Accipiter fasciatus fasciatus* Australian Goshawk Taba

*Anas gibberifrons remissa* Grey Teal Ghamanaghi mai  
Hatuhua

*Phalacrocorax carbo novaehollandiae* Black Cormorant Manukitai'ugi

For eleven Rennell populations the direction of origin cannot be fixed because they belong to subspecies that are widespread in several directions around Rennell.

*Sula sula rubripes* Red-footed Booby Maukera adult  
Taimoana young

*Sula leucogaster plotus* Brown Booby Kanapu adult  
Katoko young

*Phalacrocorax melanoleucos brevicauda* Little Pied Cormorant Manukitai adult  
young Ghaghiabolu

*Egretta sacra sacra* Reef Heron dark phase Kagau'ugi  
white phase Kagau tea

*Anas superciliosa pelewensis* Australian Black Duck Ghamanaghi'ugi

*Porphyrio porphyrio samoensis* Purple Swamphen Kagae adult  
Beka juvenile

*Sterna sumatrana sumatrana* Black-naped Tern Gopiti

*Sterna anaethetus anaethetus* Brown-winged Tern Bagabaga

*Anous stolidus pileatus* Common Noddy Ngongo

Similarly, the direction of origin for the species;

*Porzana tabuensis* Sooty Rail Moso

and superspecies ;

*Rhipidura rennelliana* Rennell Fantail Magighape

cannot be given because they are from groups that are widespread in several directions around Rennell (Australia, Papua New Guinea, Bismarcks, Solomons and Vanuatu).

Two non-endemic populations;

*Caloenas nicobarica nicobarica* Nicobar Pigeon Kagae gangi

*Ducula pacifica pacifica* Pacific Pigeon Gupe

one endemic subspecies ;

*Ptilinopus richardsii cyanopterus* Pink-spotted Fruit Dove Higi

and one endemic allospecies ;

*Aplonis insularis* Rennell Starling Ghaapilu-mouku

belong to species or superspecies that occur on scattered small islands but that are absent from the main Solomon islands. These "supertramps" are species selected for high dispersal ability but have inferior competitive ability, so that they are unable to establish themselves on species-rich large or central islands, unless in species-poor habitats there.

**Thus the Rennell avifauna is a mixture of 13 -16 colonists from the Solomons, 4 - 9 from Vanuatu, 4 - 5 from Australia and 4 from small islands.**



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## **E : Legislation: Details**

### **National and Provincial Governments - Devolution**

The Constitution provides for Parliament to divide the Solomon Islands into provinces. In making provision for the government of the provinces, Parliament must also consider the role of the traditional chiefs in that government. The only role spelled out for the chiefs by the legislation seems to be that of mediator in customary land disputes under the Local Courts (Amendment) Act 1985.

### **Land Tenure:**

The customary land tenure system and traditional land use practices have been the basis for management and use of flora and fauna. Traditional practices include seasonal bans on hunting and fishing, tambus (prohibitions) on the killing and eating of particular species and the exclusion of outsiders from communal territory. These practices have developed to ensure sustainable and continued use of natural resources into the future.

Some 87 percent of land in the Solomon Islands is held under customary ownership, much of which is not registered under the Land and Titles Act 1978. Land is of great importance. “The clan is its land, just as the clan is its ancestors. Each man must have some place, some land which belongs to him, which is his territory. If he does not control any land, he has no roots, status or power (Bonnemaïson 1984).” This was written about

Vanuatu but is also true for the Solomons.

With customary land tenure, there are divisions into “primary and secondary rights”. Primary rights mean collective ownership comprising the right to use and dispose of (i.e. lease or exchange) the land and the right to sell the products of the land. Secondary rights can mean a limited form of collective ownership comprising the right to collect the products of the land or use the land as a garden. Other uses must be with the consent of the primary landowner. The secondary right can be a temporary right granted by families and tied to family membership and can sometimes be granted to strangers. In custom, land is not owned by a person but by a line or family or tribe.

Any exploitation of forest resources or other vegetation on customary land can only take place with the consent of the landowners. Decisions about the use of land for purposes such as tourism are also made by the landowners.

### **Marine Tenure:**

In the traditional system, a group may claim exclusive use of an area of sea, beach or lagoon. Outsiders are excluded and may only fish with the permission of the group. This may be restricted to certain times of the year and be conditional on payment, gifts or a proportion of the catch. These conditions also apply to gathering of shells and other products.

Customary marine tenures are recognised in that fishing rights are protected in the Fisheries Act 1972 so that reef owners can control who fishes in their customary

waters and agreements can be made about the purchase of marine products. The nominated area includes the reefs and sea out to three nautical miles which is all in customary marine tenure.

### **Research Act 1982:**

Under this Act special permission is required from the Research Application Committee in the Ministry of Education before someone can do research in the Solomon Islands. “Research” is widely defined and covers the work involved in environmental survey and data collection.

### **Pollution:**

With the exception of Western Province, there is no specific legislation or policy dealing with water, land, noise and air pollution at national or provincial level in the Solomons. There are provisions in other legislation such as the Environmental Health Act 1980 and the Mines and Minerals Act 1990 which is quite stringent in relation to pollution.

### **Biodiversity Conservation:**

The Solomons has no system for the conservation of biodiversity. There is no control to prevent foreign businesses in the biotechnology trade from extracting and exporting for overseas analysis and use, flora and fauna which could be of considerable commercial value.

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### **Protection of Wrecks and War Relics Act 1980:**

This Act restricts access to and interference with ships, aircraft and associated objects which were brought into the Solomon Islands by, or for use, of combatants in World War Two. The Act allows the Minister to designate any area around the site of an aircraft or vessel as a restricted area. Offences include tampering with, damaging, or removing any part of an aircraft or vessel, or any other war relics. The existence of the legislation has been essential to prevent foreign entrepreneurs from purchasing World War Two memorabilia (e.g. aircraft) from local people and exporting them out of the Solomon Islands.

There are a number of World War Two relics inside the nominated area. The local people regard them as part of their history and as attractions for tourists. The Americans had a small airforce base at Tigoa at the eastern end of the lake. There are a number of Catalina flying boats in the lake and one can easily be seen in shallow water outside Hutuna village.

### **Town and Country Planning Act 1979:**

The Physical Planning Division can only advise customary landowners, but cannot require them to act in any particular way in terms of development and conservation issues.

### **The Fisheries Act 1972:**

This was enacted to control the activities of commercial fisheries and processing operations under joint ventures

with the government. The Act empowers the Minister to make Regulations for such things as restricting size of nets, types of gear or methods of fishing.

Administration of the Act is carried out by Fisheries Officers. The Fisheries Regulations are important from an environmental point of view because they set size limits for crayfish, trochus shell, coconut crabs, crocodiles and turtles.

### **Review of Legal Protection for East Rennell:**

There is currently no adequate legislation that protects the natural and cultural features of East Rennell. It is desirable that some all-encompassing environmental legislation be enacted soon, so that other special areas in the Solomons are given protection. It should be emphasised that customary protection at East Rennell is quite strong and when the World Heritage Act is passed, they will complement each other.

### **F : Video and Film Documentaries**

1. T. Aseda as a member of the Templeton Crocker Expedition in 1933 produced a film on Rennell and Bellona. The film is kept at the Smithsonian Institute, Washington, D.C.
2. G.J. Mackay (1936) "A Movie-cameraman on Rennell." Pacific Islands Monthly, 24th January, pp. 44-45.
3. H. Mielche (1954) Hos Polynesierne på Rennell-øen. Producent: Galathea-Expedition, 1954; produktionsleder: Hakon Mielche; fotograf: Mogens

Høyer; sagkyndig: dr. phil. et scient Kaj Birket-Smith. Stumfilm, farver, 2 spoler, 215m, 20 minutter. Available from Statens Filmcentral, Copenhagen, Denmark (Skolefilmkatalog 48.97h).

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5. N. Haslam (1996) Rennell and Bellona - Ecotourism Destination. A colour video (UHS/PAL) in English. 18 minutes. Filmed and produced by N. Haslam; Executive Producer, E.J. Wingham. Available from the Solomon Island Visitors Bureau, P.O. Box 321, Honiara, Solomon Islands.

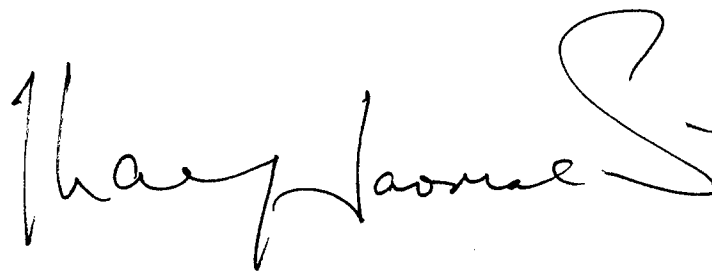
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Signed :

A handwritten signature in black ink, appearing to read 'William Haomaë'. The signature is written in a cursive style with a large, looping flourish at the end.

Full name : Honourable William Haomaë M.P.

Title : Minister of Culture, Tourism and Aviation.

Date : 30 June 1997

# **Attachment 1**

## **RESOURCE MANAGEMENT OBJECTIVES AND GUIDELINES FOR EAST RENNELL, SOLOMON ISLANDS.**

Prepared by Dr Elspeth Wingham

for the

**New Zealand Official Development Assistance Programme,**

**Ministry of Foreign Affairs and Trade**

May, 1998

## ACRONYMS:

AusAID	Australian Agency for International Development
CI	Conservation International
EIA	Environmental Impact Assessment
NEMS	National Environmental Management Strategy
NGOs	Non Governmental Organisations
NZODA	New Zealand Official Development Assistance
PID	Project Implementation Document
RMP	Resource Management Plan
SIDT	Solomon Island Development Trust
SOLTRUST	Solomon Island Trust
SOPAC	South Pacific Applied Geoscience Commission
SPBCP	South Pacific Biodiversity and Conservation Programme
SPREP	South Pacific Regional Environment Programme
SWIFT	Solomon Western Islands Fair Trade
TMCC	Tegano Management and Conservation Committee
TNC	The Nature Conservancy
WWF	World Wide Fund for Nature

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# RESOURCE MANAGEMENT: OBJECTIVES AND GUIDELINES

## **1.0 INTRODUCTION:**

The area of East Rennell, Solomon Islands is moving towards protected area status and has been nominated for World Heritage listing as a natural site.

**The purpose of this document is to state the objectives and guidelines for sustainable management of resources in the area.**

After a process of community consultation and participation, a resource management plan (RMP) for the East Rennell area will be developed. It is difficult to put a time frame on when this will be completed because it will depend on the priorities that the village people place on being able to commit time to putting on paper a description of sustainable management practices that are inherent in their customary practices which have so maintained the area's natural values that they are considered to be of World Heritage quality. The resource management plan will cover practical details on how the objectives and guidelines will be implemented.

The guiding principles in the preparation of this document are:

**“ that the aim of sustainable resource management for East Rennell must be considered in the context of the natural, socio-economic, cultural and political environment and their interconnections.”**

Some of these principles have been clearly expressed in the National Environmental Management Strategy (NEMS);

“We are acutely aware of the vital importance of economic development for Pacific Island countries and are equally concerned for the limited natural resources and often fragile nature of the environment of these countries. It is thus critical that development continues, but in a manner which is truly sustainable ecologically. Only by following such a course of action can the quality of life currently enjoyed by Pacific people be assured for future generations.”

The East Rennell area is under customary land ownership and the long-term sustainable management of the area depends on the will of the East Rennellese people. Taking this into consideration, from the outset of the programme, recognition and vital consideration has been given to customary issues, interests and aspirations of the local people. This has meant developing a participatory process with the East Rennellese people and has required that East Rennell be considered holistically and not just focussing on the environment but also on the social, cultural and economic issues. Participatory rural appraisal surveys have been carried out at most of the villages in the area and there is now sufficient baseline data to build on.



## **2.0 ENVIRONMENTAL FEATURES OF EAST RENNELL:**

This is covered in detail in "Nomination of East Rennell, Solomon Islands for Inclusion in the World Heritage List - Natural Sites" (Wingham 1997). A brief summary is given:

### **2.1 Flora.**

The flora of Rennell is significant because the species composition is biogeographically unique. Although there are currently only ten endemic species recorded for Rennell, this is likely to increase as specialist collections are made. The endemic species found at East Rennell include an orchid found on the lake islands, three species of *Pandanus* and an undescribed palm.

### **2.2 Fauna.**

With the exception of Papua New Guinea, the Solomon Islands have a greater diversity of animal species and higher level of endemism than any other Pacific island nation. Within the Solomon Islands, Rennell has the highest occurrence of endemism for an island of its' size. Rennell is famous for having developed many unique species and races of birds because of its isolation.

2.2.1 Mammals. Rennell has eleven species of bats and they are the only indigenous terrestrial mammals. There is one endemic bat species which is considered vulnerable or endangered and there are two endemic subspecies.

2.2.2 Birds. Rennell has 43 breeding land and water bird species, of which four are species endemic to Rennell, nine are subspecies endemic to Rennell and seven are subspecies endemic to Rennell and Bellona. The proportion of endemic taxa (47 %) that is found on Rennell (including the seven subspecies also found on Bellona) is extremely high. The East Rennell area is important because it includes all the habitats found on Rennell and it contains a viable representation in natural conditions of most of the endemic bird species.

2.2.3 Reptiles. Lake Tegano is the only location for the endemic sea krait, *Laticauda crockeri*. It is the second record of a sea snake living in a freshwater lake. No amphibians have been recorded on Rennell.

2.2.4 Invertebrates. Rennell has 27 species of land snails belonging to 15 families. Seven species are endemic and two species are restricted to Rennell and Bellona. The genus *Quirosella* (Ariophantidae) is endemic to Rennell.

2.2.5 Crustaceans. The coconut crab and two or three other species of land hermit crabs occur on Rennell. Numbers and size of coconut crabs are declining due to harvesting for sale by the East Rennellese. Four species of land crabs are found throughout the forest.

2.2.6 Insects. Of the insect groups investigated on Rennell, moths have the greatest number of species (total = 246). Of these, 35 species and 25 subspecies are endemic to Rennell and 5 species and 6 subspecies are found only on Rennell and Bellona ie. 29 % of moths are endemic. The number of moth species may be typical for an island of this size but without more scientific investigation, it is not possible to make comparisons. Also the level of endemism cannot be put into context because there is no comparative information for other islands in the Solomon's group.

2.2.7 Fauna of Lake Tegano. A total of 78 species of animals were recorded from the lake. Of these, 56 were able to be identified and 12 species and one subspecies are endemic to the lake. Also, there are three genera of crustaceans that are endemic to Lake Tegano.

### **3.0 SUSTAINABLE DEVELOPMENT OBJECTIVES:**

These objectives collectively point the way towards the goal of sustainable development.

They are to:

1. improve environmental and cultural awareness and education
2. integrate social, cultural and environmental considerations into economic development
3. strengthen the resource and cultural information databases
4. protect areas of high ecological, wilderness and cultural value
5. improve waste management and pollution control
6. sustainably manage land resources and the environment
7. sustainably manage forest resources and the environment
8. sustainably manage marine resources and the environment
9. sustainably manage coastal resources and the environment
10. sustainably manage lake resources and the environment
11. ensure that exploitation of non-living resources is environmentally safe
12. develop systems for local people to monitor the environment.

### **4.0 ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT OBJECTIVES:**

The NEMS was prepared in the Solomon Islands and was published in 1993. It involved wide consultation mainly at national and provincial government levels. The following section is based on the NEMS framework and translates some of the goals and strategies to ensure compatibility with customary practices of the East Rennell communities.

In the sections referring to East Rennell, activities are identified that are necessary for achieving sustainable development. These activities are covered in the Project Implementation Document (PID) which describes how they will be actioned:  
[ where square brackets are used, it refers to the appropriate section in the PID ].

#### **4.1 Improvement of Environmental and Cultural Awareness, and Education.**

“For environmental management to be effective in the long term, an informed and supportive public is obligatory “ (NEMS, 1993).

This quote explains why so much importance is given to environmental and cultural awareness and education. To achieve this, it is a high priority to raise the environmental and cultural awareness of the community at national, provincial and local levels. Some of the methods that could be used are:

- conduct provincial, district and village level environmental and cultural awareness workshops so that public awareness of environmental issues will be enhanced, with a resultant increase in public support for environmental management initiatives
- improve and increase the environmental content of school curricula at all levels including kindergarten and tertiary,
- develop materials for environmental education so that a better informed public will be more aware of the environmental consequences of their own actions and more capable of reaching well-informed conclusions on sustainable development issues
- train environmental and cultural awareness trainers, officers and advisers
- develop environmental and cultural awareness and education at village level with close involvement of traditional and elected leaders and members of the Church
- undertake participatory needs analysis to develop targeted, appropriate, effective and locally supported programme of awareness raising and education.

When holding workshops at village level, it is especially important to include women because their working day activities always involve the environment and women have an important role in shaping the attitudes of their children. It must also be remembered that the resource owners decide what activities will occur on their land and so they should be a prime target for awareness-raising programmes. Likewise, if the resource owners are informed about environmental legislation or a resource management plan and the reasons for it, they are more likely to comply. The resource owners should also be made aware of the long term benefits available to them and the opportunities offered.

Religion is central to the way of life of most village people and Ministers of religion are accorded a high degree of respect. They wield considerable power in the community and are a very important channel for shaping opinion on social issues. Ministers should be assisted in ways they consider appropriate to promote the environmental message.

There is a need to develop environmental fact sheets, educational resources and visual aids. To introduce this material to schools, it will be necessary to make links with the Ministry of Education, Ministry of Forests, Environment and Conservation and NGOs such as the South Pacific Regional Environmental Programme (SPREP), Solomon Island Development Trust (SIDT), Greenpeace, Conservation International (CI), The Nature Conservancy (TNC) and World Wide Fund for Nature (WWF) to see what is currently available. Assistance may be needed to provide factual information in a form that is suitable and easy to understand at village level.

There is a need for environmental awareness training for Government Officers. Provincial Fisheries and Agriculture Extension Units already reach many rural

communities, as do Tourism Officers. However, their training emphasises economic development with little environmental background. To counter this, regular in-service training could be held to cover environmental management and to inform the Officers of recent developments. It would be appropriate for the Ministry of Forests, Environment and Conservation to coordinate this with technical assistance from SPREP.

#### 4.1.1 For East Rennell:

A workshop aimed at provincial government members and leaders of the local community, including the Church, is proposed. It would aim to give an overview of all the environmental, social, economic, cultural and resource management issues for the area and how they can be considered and addressed through development of the resource management plan and, if considered necessary, through legislation. A similar workshop will be repeated for leaders of women and youth; [ Activity 2.1.1 in PID ].

At village level, the East Rennell Environmental Drama Group will communicate issues and information to local people. These performances will be followed by group discussions about the issues raised and possible ways to deal with them. It is proposed to identify some young men and women with an interest in the environment or culture to have extra training and possibly have a future role as environmental or cultural advisers / officers / awareness trainers for the community. [ See activities 2.1.1 & 2.1.4 in PID ].

A workshop will be planned for the schoolteachers on Rennell where they are given information and materials to help teach in a creative way about the environment. Consideration will be given to introducing to East Rennell, the New Zealand Official Development Assistance (NZODA) Early Childhood Education Programme which works with mothers and preschool children, with the inclusion of environmental matters along with its usual programme. [ See activities 2.1.1 & 2.3.3 in PID ].

## **4.2 Integration of Social, Cultural and Environmental Considerations into Economic Development.**

The immediate concern is to ensure that development proposals are subject equally to environmental as well as economic, social and cultural appraisal.

Ideally there should be an integrated approach to physical planning, economic planning and environmental protection at both national and provincial government levels and extending to the area council level within the provinces. In conjunction with this, there should be a complimentary strategy introducing a framework of national and provincial environmental law, together with the means to enforce it in a manner that is acceptable to local communities.

One of these laws should cover the use of environmental impact assessment (EIA) procedures. The adoption of EIA as a routine administrative function is possible following work done by the Australian Agency for International Development (AusAID) for the Ministry of Forestry, Environment and Conservation and it should be applied to both private and public sector development proposals.

#### 4.2.1 For East Rennell:

Currently for any medium to large-scale economic development to occur, developers need a business licence issued by the Provincial Government. The Provincial Government has a planner and the requirement for sustainable development in East Rennell is understood. This makes it difficult for potentially detrimental businesses to become established especially with the added responsibilities to maintain the area's integrity consequent on World Heritage listing.

In addition to this, the Paramount Chief of East Rennell exercises his power to decide on resource use within the area and has disallowed some extractive businesses that were intending to harvest natural resources. The Tegano Management and Conservation Committee (TMCC) currently plays an important role in establishing the rights of resource owners and users to harvest natural resources and in screening small business applications to see if they are sustainable. The roles and the procedural steps for involvement of the Paramount Chief, the Council of Chiefs and the TMCC in working together to protect and manage the natural resources, will be discussed and recorded in the RMP. [ See Activity 2.5.2 in PID ]

Problems are currently referred to the Council of Chiefs and Paramount Chief to be resolved. If the problem continues, an enforcement officer from the appropriate Ministry is asked to intervene.

Once the RMP is accepted and actioned by the East Rennell people, the Ministry of Forestry, Environment and Conservation will be requested to chair reviews of the plan and the Ministry for Commerce, Employment and Tourism will undertake reviews that involve ecotourism and small business development. [ See Activity 2.5.2 ]

The Tegano Management and Conservation Committee, the Council of Chiefs and Paramount Chief effectively screen all local small business proposals to see if they are sustainable and for environmental and social impact. They are performing a local level EIA role. Discussions with the Provincial Government will hopefully result in their adoption of the EIA guidelines that should be applied to larger scale developments involving people or organisations from outside East Rennell. [ See Activity 2.1.2 ]

The Rennell and Bellona Provincial Government may decide to prepare ordinances similar to those developed in Western Province to help protect the environment. Unfortunately, the province does not have its own legal officer. It may be possible to receive assistance by seconding or funding, a suitably skilled person for a specific task. [ See Activity 2.5.1 ]

### 4.3 Strengthen the Resource and Cultural Information Database.

There are many gaps in knowledge about resources and traditional methods of management throughout the Solomon Islands and without this information, this inhibits the achievement of sustainable use of natural resources.

In 1995 the Solomon Islands National Forest Resources Inventory was completed (Vol.9, Rennell and Bellona Province). The inventory was oriented largely to forests with potential for commercial development. It added to botanical knowledge especially regarding distribution of species but it was not intended as a substitute for a botanical or ecological survey. A botanical survey would cover all plant life, their ecological associations and the traditional uses of plant species.

#### 4.3.1 For East Rennell:

Information is needed concerning introduced animals and their abundance and distribution on Rennell. Species which may threaten native fauna are the feral cat and the ship rat (*Rattus norvegicus*). So far, the absence of a wharf has prevented the introduction of ship rats which can cause the loss of many bird species especially on islands lacking mammalian predators. Until a survey has been done there is insufficient information about pest species such as feral cats. If there was a need, a programme to determine their numbers would be developed.

A snail has recently been introduced to Rennell, probably on cuttings from Honiara, and it has caused problems by eating the village people's main leaf vegetable, slippery cabbage. It is not known if it is confined to gardens or whether it is spreading into the forest. It is also not known if it is impacting on the indigenous snail species.

Studies at East Rennell that need to be done are:

- an ecological survey of the terrestrial vertebrate and invertebrate fauna to enable assessment of the status of species and identification of threatened species. It should identify pest species as well and give information on numbers and distribution. Also improved knowledge of the fauna will allow better management decisions and environmental planning. This is especially important for coconut crabs which are being commercially harvested. They are likely to appear as a threatened species due to their slow growth and low recruitment rates.
- a systematic botanical survey that ideally is combined with the fauna survey (above) to give habitat information that is crucial to wildlife management. Some assistance may need to be provided for the curation and preservation of plant and animal specimens in the national collections.
- a survey of known endangered species including flora and fauna. The Rennell Orchid occurs naturally only on a few islands within the lake. Its distribution and abundance should be recorded. Also the bat, the Rennell Flying fox (*Pteropus*

*rennelli*, local name = Langa) which is considered vulnerable or endangered. It is known from only five specimens and the two most recently collected were taken in 1962 and 1965.

- a survey of reef resources. There is some baseline information on species, habitat types and biodiversity of the fringing reef around Rennell (Babcock 1994). There has been commercial harvesting for some species e.g. beche de mer and crayfish. Currently, some reef fish are being harvested by local youth to supply the villages. More detailed surveys are needed to determine the stocks of these and other commercial species so that with advice from fisheries officers and in consultation with the local people, a sustainable harvesting programme can be developed.
- a survey of the lake invertebrate fauna. It is possible that the rich invertebrate fauna of the lake that was recorded by the scientific expeditions no longer exists. The government introduced *Tilapia mozambica* to the lake around 1957. There have been no systematic collections of lake invertebrates since then so the impact of *Tilapia mozambica* on the original lake fauna is unknown.
- a survey of lake vertebrate fauna. Detailed surveys of lake fish are needed because *Tilapia mozambica* is the most harvested protein source for the people of the lake side villages. The survey should cover all vertebrate species, especially the two food species; *Tilapia mozambica* and the eel, *Anguilla obscura* and including *Eleotris fusca*, a small bully which is eaten by the endemic sea krait.

[ All the above surveys are included in the Project Implementation Document under Activity 2.4.1].

#### **4.4 Protection of Areas of High Ecological, Wilderness and Cultural Value.**

Approaches attempted in the Solomon Islands to foster the establishment of protected areas have, in the past, met with little success because they lacked a participatory approach and failed to consider customary land tenure, traditional practices and enforcement. For most of the Solomon Islands, there are currently neither legislative measures nor incentives for conservation area establishment.

Progress towards conservation and sustainable management is being made at the Arnavons, a marine reserve and at Komarindi, an area of virgin forest. Both of these areas were identified for their biodiversity values and the Ministry of Forestry, Environment and Conservation has been working, in a participatory manner, with the communities in these areas under the South Pacific Biodiversity and Conservation Programme (SPBCP). East Rennell has outstanding natural values and the World Heritage / Ecotourism Programme, a bilateral aid programme between the New Zealand and Solomon Island Governments, is also making progress by working with the local community using participatory methods.

To date the Solomon Islands lacks a conservation area that is a demonstrable success and that can be used as a role model. This is highly desirable if groups of resource owners are to be convinced of the economic and other quality of life benefits that result from protecting special areas. Without this resource owner awareness and commitment, there might be little chance of successfully developing a

system of protected or conservation areas.

Some possible methods to promote conservation and sustainable management areas on customary land are:

- to develop model conservation areas with full resource owner participation. The fundamental concepts would be to protect biodiversity and to manage the area sustainably.
- to develop a range of approaches and legal arrangements for secure protection of areas under customary land tenure to be considered by stakeholders and members of Area Councils, Provincial and National Government.
- by establishing links with similar initiatives such as regional and international biodiversity programmes being run by Governments and NGOs.
- by involving customary landowners in the process of identifying areas of ecological, wilderness and cultural significance.
- by developing a participatory process that involves the communities in the areas in all stages of the development of the conservation area.
- to promote ecotourism and other small business alternatives that are sustainable and do not harm the environment. These may require external funding and should be considered as part of the social and economic development package that must be considered if communities are not to be disadvantaged by choosing conservation or sustainable management.
- to protect and manage Solomon Island wildlife ( including the wildlife trade )
- to reinforce the use of traditional knowledge and management systems in contemporary resource management

#### 4.4.1 For East Rennell:

To establish a conservation area in East Rennell, a RMP based on a diagram that illustrates the ideal environment is being developed. It is hoped that in time there will also be provincial ordinances that support the aims of conservation and sustainable use of resources. To ensure that the RMP be accepted, the aim is to ensure a high level of understanding and participation by local people. Every effort will be made to involve all sectors of the community so that the RMP is "owned" by the East Rennellese people. [ See Activities 2.5.1 & 2.5.2 in the PID ].

In the proposed World Heritage sites of East Rennell and Marovo Lagoon, the main emphasis is on nature conservation and sustainable development. Ecotourism is included as a secondary use. It is seen as having beneficial spin-offs in generating employment not only for the lodge owners and their families but for providers of food and transport, a sales outlet for crafts, tour guides and so on. The level of ecotourism at East Rennell is low at the moment and to-date there are few detrimental effects on the environment or the local culture. To minimise bad impacts,



it is proposed that the local people be assisted to monitor the effects of ecotourism as it develops. [ See Activity 3.1.4 ]

There is a need to provide incentives if resource owners and communities like East Rennell choose to manage their land sustainably. This is addressed in the NZODA funded, World Heritage Programme with small business development assistance. The area is also likely to benefit from other development assistance programmes which may want to work there because there is infrastructure in place eg. radio communication, personnel and transport. These programmes will hopefully broaden the range of assistance and advice available to the village people so that their basic needs such as drinking water, sanitation and education, can be improved. [ See Activities 3.3.6 & 2.3.2 ]

A key aim of the RMP will be to protect and manage the wildlife of Rennell especially the endemic species and subspecies such as the birds, lake snake and the orchid. It is proposed that be rules established to prevent the sale or collection of specimens as there have been unscrupulous collectors visiting East Rennell. [ See Activity 2.5.2 ]

A goal of the RMP will be to recognise and record the culture of Rennell and where ever appropriate, use traditional methods for looking after the environment. By working with the elders and valuing their contribution, the aim will be to ensure that traditional skills and knowledge will be passed on to the youth and children. [ See Activity 2.1.4 ]

#### **4.5 Improvement of Waste Management and Pollution Control.**

The following are strategies that would improve waste management and help control pollution in the Solomon Islands:

- to improve management of solid wastes and sewage
- to control the level of pollution from businesses and other activities
- to reduce the use of toxic chemicals and handling of biocides and other toxic chemicals.

Systems need to be developed to improve the collection and disposal of solid wastes which includes managing landfills and garbage pits. There also needs to be a public education programme for managing solid, ie. non-biodegradable waste. Sewage treatment systems need to be considered where ever people live in groups for any length of time. If this is not addressed, there will be detrimental effects to public health and environmental deterioration.

The reduction of pollution from industrial processing and some businesses is not a major problem at present but could become so in future. For new industrial developments, they should be scrutinised carefully to consider environmental impact and if necessary, environmental standards could be set that the developer must meet to continue operation. It may be necessary to regularly monitor industrial wastes and means of dealing with them.

Biocides include the wide range of insecticides, herbicides, acaricides, nematocides and other highly toxic poisons. There is a need for an educational programme that covers the safe use, control and storage of chemicals. This applies to Ministry of Agriculture staff and Extension Officers who may be promoting the use of biocides at village level to combat pests. The problems of storage and disposal of unwanted stocks of biocides need to be addressed at national government level.

Air pollution can be a problem and there is a need for Agriculture Officers to evaluate farming methods that involve burning. This should cover the timing of burning and the necessity of burning for different crops. It is also necessary to develop a control plan if the fire spreads out of control.

#### 4.5.1 For East Rennell:

There is increasing pollution around villages. At East Rennell, it is not as bad as in some other areas within the Solomon Islands and there is the opportunity to act now before it becomes worse. Without corrective action and education for the village people, human and environmental health will deteriorate.

Often tins and plastics, old drums and batteries can be seen around villages. The problem that they will not readily breakdown and will accumulate over time will be addressed in the RMP. Ways to deal with disposal of solid wastes for each village should also be an outcome of the environmental and cultural awareness and education programme. [ See Activities 2.5.2 & 2.1.1 in the PID ]

An education programme on sanitation and hygiene will be undertaken for East Rennell to ensure that, when sewage disposal is considered, care is taken so that it does not pollute the lake by entering the subterranean water system. The best outcome for East Rennell will be achieved by pooling the resources, staff and skills of the Provincial Water Supply and Sanitation Unit, the AusAID Programme (Rural Water Supply and Sanitation) and other programmes offering sanitation and hygiene education. [ See Activities 2.3.2 & 2.3.3 ]

As small businesses increase, those that require power will make increased demands on petrol and fuel. Management of drums and chemical containers is much easier in the towns where they can be returned to depots and re-used. There may need to be a subsidy paid to cover the costs of returning diesel and petrol drums, old batteries, chemical containers etc to keep the environment clean and to prevent a bigger problem developing over time. This issue will be addressed in the RMP. [ See Activity 2.5.2 ]

Biocides are used on a very small scale at East Rennell and it is proposed that the few people involved have training in safe use and storage of the chemicals. The possibility will also be considered for these people with Agriculture Officers, to use less expensive options for pest control such as companion planting, in suitable situations. [ See Activity 2.3.3 ]

Garden fires do sometimes spread out of control and are normally left to burn themselves out. The RMP will address the need for more control over burning in some areas, especially in dry seasons, if they are near areas of high environmental or cultural value. [ See Activity 2.5.2 ]

## 4.6 Sustainable Land Management (excluding forestry).

Land resource management must be considered within the context of the customary land tenure system. Under this system, land is "owned" in perpetuity and used by a clan according to traditional rules that are specific to an area. Government policy recognises that such land is owned usually by a lineage group. Under the direction of chiefs or elders, individuals or family groups are given a right to a piece of land to harvest, cultivate or occupy.

Careful planning of land use under customary tenure involves an extended process of consultation and consensus-reaching. This process involves particularly the genealogies of landowning groups, land boundaries and primary and secondary usage rights for parcels of land.

In many rural areas of the Solomon Islands, the increasing pressure to produce cash crops has caused an intensification of land use. This is manifested in reduced fallow periods and, in the absence of costly inputs such as fertilisers and biocides, must lead to land degradation. Two strategies that would serve to protect village food production are:

- to protect the best soil for food crop production ( rather than cash crops )
- to promote efficient forms of traditional agroforestry practice
- to protect water supply catchment areas.

It is very important that women and men consult on these matters (land to be used for food versus cash crops) and work together to plan land use. It is also important to preserve traditional knowledge and management structures. This information needs to be documented and built on eg. to improve the productivity of traditional agricultural practices while safeguarding the protective role which nature-intensive systems usually have on the environment.

### 4.6.1 For East Rennell:

The people of East Rennell live in villages and most have a subsistence lifestyle. Most of their food comes from gardens that are cultivated using "slash and burn" techniques and are supplemented by hunting and gathering from the forest. While the secondary forest used in the gardening cycle may have little commercial value, any expansion of agriculture (due to increasing population or lower yields etc.) will inevitably impinge on the primary forest resource and the environment. The increasing pressure to produce cash crops to buy goods and pay for school fees has caused an intensification of land use. This usually results in reduced fallow periods. Location of gardens for some clans is an issue because the missionaries wanted people to live in villages, rather than in scattered groups near their gardens. The result is that some clans are far from their traditional garden sites.

It is proposed that the RMP will adopt as a basic principle when considering zoning of land for various uses, that the most fertile ground be reserved for food production. [ See Activity 2.5.2 in PID ]

Low cost input methods for improving crop yields have been researched extensively in the Pacific, including the Solomon Islands. Practices such as mulching and maintaining plant cover within mixed cropping agroforestry have been adopted in areas of Temotu Province. By working with the Ministry of Agriculture, suitable techniques that fit the climate and soils of Rennell may be worth trials. [ See Activity 2.3.3 ]

Traditional knowledge of use of land resources such as the use of forest foods should be maintained and recorded. The local East Rennell people have returned to using forest plants following an infestation of snails which has reduced the slippery cabbage crop. [ See Activity 2.1.4 ]

Clean and adequate drinking water is considered a fundamental human right. The hills and valleys that cover most of the Solomon Islands and form water catchment areas, are not features of Rennell. There are no streams or rivers on Rennell although there are freshwater springs around the lake edge and they emerge in various places from the cliffs at the coast. The whole island acts as a porous water catchment area and it is thought that sub-surface water flow is likely to be directed along the lower central axis of the island from the higher western end eastward, until it enters the lake.

Only a few houses in each village at East Rennell have their own rain water tank. Most people rely on springs and subterranean streams that feed freshwater into Lake Tegano. Even during drought conditions, these springs continue to supply water.

The effects of mining and forestry and the soil disturbances they would cause on the subterranean streams, are unknown. These developments could impact on the purity of water for drinking and could add sediment and pollute Lake Tegano. The RMP will address these issues to ensure maintenance of the integrity of World Heritage values. [ See Activity 2.5.2 ]

#### **4.7 Sustainable Use of Forest Resources.**

Sustainable forest management is a major issue in the Solomon's. The main areas of concern are;

- the disparity between the area of forest harvested and the area reforested,
- customary land tenure, and
- environmental impacts of forestry activities.

Attention must be paid to the development of practical systems for environmentally acceptable forest management on customary land, to the benefits of resource owners and the broader community. The environmental impacts associated with logging include soil damage, water pollution, loss of biodiversity and a shortage of traditional bush building materials, food and medicine. In some areas, cultural sites have been disturbed and key habitat areas for various species of animal have yet to be identified, so critical habitat loss is a risk.

The need for effective community awareness programmes on forestry issues is critical. There needs to be greater community awareness in relation to forestry practices and the value of forests. Also, there appears to be a lack of information on landowner rights in relation to forestry operations.

Throughout the Solomon Islands, forest research is required particularly on natural rainforest regeneration and growth rates. Also regarding agroforestry techniques and production of multi-purpose species such as food trees and some palms. Some NGOs such as SIDT, SOLTRUST, SWIFT and Greenpeace have sustainable forestry programmes and would be very useful to consult for practical experience.

#### 4.7.1 For East Rennell:

Most of the land at East Rennell remains under customary tenure and decisions concerning that land are the direct responsibility of the resource owners. With an effective awareness programme, the communities' commitment to sustainable resource management that includes forests will be reinforced. Traditional knowledge about forest use such as species used for building materials, food and medicines will be recorded. Recommendations about these and other useful species and their harvesting will be included in zoned areas within the management plan. [ See Activities 2.1.1, 2.1.4 & 2.5.2 in the PID ]

### 4.8 Sustainable Use of Marine Resources.

There appears to be an abundant offshore fishery around the Solomon Islands. At present there are countries operating in Solomon Island waters with joint venture agreements to harvest some of these resources. Agreements should be negotiated that provide training and financing so that over time, these become Solomon Island ventures. It should be remembered that Solomon Islanders have one of the highest per capita seafood consumption rates in the world and there is a heavy reliance on marine resources.

Goals for the Solomon Islands could be;

- to ensure an equitable and sustainable economic return from commercial fishing,
- to maintain a sustainable yield of a variety of marine foods for the Solomon Island people, and
- to promote establishment of marine reserves and conservation of endangered species eg. turtles.

For deep sea and offshore fisheries, the remuneration to local fishermen who sell their catch to fishing companies seems, in general, to be inequitable. Agreements negotiated between villagers and such companies need more careful supervision at provincial level by Government Officials and Fisheries Officers.

Establishing marine reserves and documenting the recovery of economically valuable species will provide encouragement to other Solomon Island communities that are

considering setting aside customary harvesting areas as no-take areas. The Arnavon Marine Reserve, which is part of the South Pacific Biodiversity and Conservation Programme (SPBCP), has been established for a number of years and there is significant recovery of some species. This reserve is important to demonstrate restocking of fisheries resources and the time for recovery that is needed. It is also a very important breeding ground for turtles.

Internationally, the Solomon Islands has a responsibility to protect endangered marine species while they are in Solomon Island waters. The Solomon Islands are the main breeding grounds for some turtle species which makes it very important that care is taken to protect these particular species so they can continue to survive. Again, awareness and education programmes are needed so that people understand the plight of endangered species and understand why and how they can assist to protect them.

#### 4.8.1 For East Rennell:

Investigation of commercial prospects for deepwater and pelagic species, not currently harvested by East Rennell, may lead to small business opportunities within the Solomon Islands initially and eventually could lead to export sales. Processing of these species at East Rennell e.g. by smoking, could add value to the product and make handling and marketing easier than dealing with fresh marine products. Some investigations into the stocks available, marketing opportunities and training of local people has already occurred. This should be supported and developed further and will be addressed in the RMP. [ See Activities 3.3.7 & 2.5.2 in the PID ]

### 4.9 Sustainable Management of Coastal Resources.

The coastal zone is affected by both land and sea-based activities. Some issues have already been addressed such as pollution control and improved waste management and the need for better information on coastal marine resources. The coastal zone contains many important fisheries habitats such as reefs, lagoons, estuaries and mangrove areas. Degradation of important fisheries habitats such as reefs and mangroves have been identified as key environmental issues for the Solomon Islands. Reef degradation is occurring through:

- sedimentation from onshore soil erosion as a result of forestry and agricultural activities,
- pollution from sewage,
- destructive fishing methods such as use of explosives and poisons,
- over-fishing through commercial activity and subsistence harvest, and
- damage to coral and live coral collection for aquaria and tourist sale.

In most of the Solomon Islands, the population is settled on the coast where coral reefs are of major importance. Reefs near larger population centres are considered to be over-exploited. The evidence may often be anecdotal but it is clear that in some areas, size and numbers of fish have declined. Some marine resources are currently being over-harvested especially beche-de-mer, trochus, green snail, goldlip and blacklip pearl oyster, reef fish, mangrove crab and crayfish.

Management of reef and lagoon resources is hampered by lack of information on sustainable yields and resource owner awareness. Sound management of any fishery is based on knowledge of its size and distribution, variations in annual recruitment levels and interactions among species. When fish are plentiful, the knowledge needs to be only approximate but, as harvest intensifies, more accurate knowledge is needed. This requires detailed study, often long term if it is to be scientifically sound.

There is a need to protect endangered marine species that use the coastal zone. The marine species of greatest conservation concern for the Solomon Islands are turtles, salt-water crocodiles and sea cows (or dugongs).

There is also a need to protect the reef fishery habitat. Some ways that this can be achieved are;

- to require moorings to be constructed for ships that regularly anchor off reefs, to prevent damage by anchors
- to educate communities on the effects of habitat damage, and
- to establish practical reef management systems with regard to culture and reef ownership system.

#### 4.9.1 For East Rennell:

Occasionally turtles are seen around the fringing reef at East Rennell. An education programme (as mentioned in 3.8.1) that details the plight of turtles in the Pacific and the key role that the Solomon Islands have as a breeding area, will be addressed in the RMP prepared for East Rennell. The impact of habitat damage to a fishery and general biological information for the coastal zone will also be included in the education programme. [ See Activity 2.1.1 in the PID ]

Sea birds breed on East Rennell and the need to give them protection will also be covered. They are of considerable interest as a tourist attraction. Some species are very abundant and following population surveys, limited harvesting may be possible. [ See Activity 2.4.1 ]

The need for a coastal zone management plan that considers sustainable management for all of East Rennell will also be covered in the RMP. It must take into account customary ownership of reefs and acknowledge that in time, there will need to be detailed plans developed for each clan or family, reef area. [ See Activities 2.4.1 & 2.5.2 ].

### **4.10 Sustainable Management of Lake Resources:**

There are a number of lakes or brackish lagoons throughout the Solomon Islands, but the two most important and documented are Lake Tegano on Rennell and Lauvi Lagoon on Guadalcanal. Lake Tegano has an endemic species of sea krait, which is found nowhere else and is the largest lake in the South Pacific (excluding New Zealand and Australia). Lauvi Lagoon supports the largest population of Estuarine Crocodiles (*Crocodyles porosus*) in the Solomon Islands. The species is considered threatened.

Freshwater wetlands and mangroves are of economic importance to the largely subsistence economy of Solomon Islanders. The leaf of the Sago Palm, is an important building material and *Pandanus* is used extensively in traditional weaving. Mangroves and other types of swamp forest supply important building materials and food resources ranging from the fruits of mangroves to a large variety of shells, crustaceans and fish. There is some information on the fish of the mangroves of Solomon Islands (Blaber and Milton, 1990) where 136 species were recorded but no estuary contained more than 50 species.

Degradation of the mangrove resource is occurring through;

- clearing for other uses such as housing settlements,
- cutting for firewood, especially for copra and beche de mer drying,
- siltation from onshore soil erosion as a result of agriculture and forestry activities, and
- land fill and coastal "reclamation", particularly for waste dumps.

People need to be made aware of the importance of mangroves and of their many different ecological functions. Mangroves provide fisheries feeding and nursery grounds; they stabilise shallow water sediments and shorelines during storms and absorb excessive run-off during heavy rains.

To look after the mangrove resource, the following strategies could be used;

- ensure use of mangrove resources is sustainable,
- prevent degradation of mangrove areas,
- rehabilitate degraded mangrove areas,
- increase public awareness of the importance of mangroves.

A mangrove case study is needed that identifies the quantity of mangrove dependent resources in an area and their value to the community. The case study would be the basis for the development of educational material on the environmental function, traditional uses and value of mangroves to local communities in the Solomon Islands for subsequent wide dissemination.

#### 4.10.1 For East Rennell:

Fish from Lake Tegano and the sea form a major part of the diet for the people of East Rennell. More information is needed concerning the stocks of *Tilapia mozambica* so that they can be managed sustainably; (this has been covered in 3.3.1). [ See activity 2.4.1 in the PID ]

The lake is affected by land and lake-based activities. Some issues have already been addressed such as solid waste disposal, sewage and the need for better information on lake resources. The lakeshore contains mangroves and fish breeding areas. Degradation of these areas would impact on the fishery and the environment. The importance of the mangroves around the lake to the fishery needs to be made clear to the East Rennell people through the environmental awareness and education programme and this will be addressed in the RMP.  
[ See Activities 2.1.1 & 2.5.2 in the PID ]



## **4.11 Exploitation of Non-Living Resources and Environmental Safeguards.**

The exploitation of non-living resources cannot be a sustainable activity because, once used, they cannot be replaced. The environmental concern is to keep inevitable damage from mineral exploration, mining activities and smaller scale activities such as gravel extraction, to a minimum while still maximising extraction of the resource.

Activities such as mining or oil drilling can potentially cause irreversible damage to living resources. This damage must be minimised through use of the best modern technology and techniques. There may be some cases where the likely level of impact is unacceptable and possible impacts should be thoroughly assessed before the development commences. If a development did proceed, effects should be regularly monitored. In addition to the environmental concerns, there is often social disruption, land conflicts and other impacts on custom. Following exploration and extraction, where access roading has been prepared, there is inevitably disturbance to the environment (and watershed) from the gardening activity that follows.

With regard to West Rennell, bauxite clays have formed on the upraised coral reef limestone. Mining was proposed on Rennell in the 1970s but the venture did not proceed due to failure of negotiations with resource owners, environmental concerns, the low price of aluminium on world markets and technical difficulties with the extraction of aluminium from the bauxite.

The Solomon Islands are highly dependent on imported fossil fuels for power. The prospect of some hydropower generation for major centres is being considered. In rural areas the cost of transporting fossil fuels and removal of used drums is an issue. Some methods to overcome this are:

- to promote use of alternative forms of energy eg. sun, water and wind power
- to promote increased use of proven alternative energy supplies at village level eg. solar power for village lighting, use of coconut oil for lamps, cooking etc.

For small communities that already have diesel generators; it is possible to reduce the need for diesel fuel by introducing solar power technology. This technology has been trialed in remote rural communities in Northern Territory, Australia. It is also possible to convert diesel trucks to run on coconut oil and this has been done in Vanuatu. There is also the possibility of wind power which is used in some areas of New Zealand. There is much relevant Pacific experience on alternative power sources and this has been studied by SOPAC. This information should be considered for application in remote areas of the Solomon Islands.

### **4.11.1 For East Rennell:**

The people of East Rennell understand that by asking to be considered for World Heritage listing as a natural site, they agree to manage the resources of their area sustainably. This means the option of mining is not possible and the RMP will make this clear. [ See Activity 2.5.2 in the PID ]

Should the possibility of mining bauxite on West Rennell be reconsidered, the people of East Rennell must consider the possible impacts to their area. Questions need to be asked about mining activities and the disturbance to the subterranean waterways that drain into the lake. There is a possibility that fine soil particles could drain into the lake and pollute it. Also if the extraction is done on Rennell, the porous nature of the substrate may drain the treatment solutions into the lake. Many other issues, not only concerning the environment, would need careful thought and resolution.

Elimination of used fuel containers is a problem and it is advisable to consider alternative power sources. It may be possible to make linkages with environmental organisations that would like to promote environment friendly power sources and work with the people of East Rennell. [ See Activity 2.3.3 ]

#### **4.12 Environmental Monitoring by Local People.**

The ability to monitor the health of the environment where people live is of vital importance. It will allow the people to state with certainty that changes have occurred and to ask the appropriate body for advice and assistance. This objective is closely linked to 4.1 Improvement of Environmental and Cultural Awareness, and Education. The people will need basic environmental knowledge before they can understand and competently carry out a monitoring programme.

##### **4.12.1 For East Rennell:**

The environmental and cultural awareness and education programme will be on going. Early on, it will be important to identify some young people with an interest in the environment and culture, to have extra training. They could become environmental and cultural officers who help coordinate the monitoring programme, among other duties and who give feed back to the communities so that the local people are aware of improvements or degradation and can be involved in correcting the situation. [ See Activities 2.1.1 & 2.1.4 ]

### **5.0 GUIDELINES:**

This section covers ten principles that will be followed to achieve the objectives. The intention is to integrate conservation with development of the local community so as to lead to enhanced benefits to the local community and the environment.

#### **5.1 Build on the Foundations of the Local Culture.**

Cultural elements are already available for contributing to conservation. Research on traditional means of resource management need to be carried out as a high priority before they are lost. Traditional means of resource management also need to be put into forms that would be useful to development planners and environment officers. Workshops will be planned to train resource managers and environment officers to be sensitive to cultural means of conservation and to collaborate productively with local people.

## **5.2 Give Responsibility to Local People.**

Former use of traditional cultural practices has shown that local people are able and competent to enforce regulations for the benefit of the community. Local development priorities will be discussed at village and district council levels and development projects should be at least partially funded locally in order to build local commitment. Local responsibility will follow local institutional patterns with the ultimate goal of participatory management. This follows from commitment and involvement of the local people in all aspects of management. Local people will provide help to generate the information on status and trends in resource use that will guide management.

## **5.3 Ownership Remains with the Local People.**

East Rennell is in customary ownership and is owned by the local people. The proposed World Heritage listing of East Rennell does not affect land ownership in any way.

## **5.4 Employ Local People.**

Where ever possible local people should be employed to work in the proposed World Heritage area. Employment gives the local people a stake in the success of the area as well as allowing them to contribute in a culturally appropriate way to the management. There may need to be environment officers who could be selected by the villagers. They would help protect cultural sites, rehabilitate degraded areas, provide information and advice and help manage wildlife.

## **5.5 Seek Links with Government Development Programmes.**

There is a need to address the basic living requirements of the people of East Rennell as well as the conservation requirements. This should be possible by making linkages to existing programmes and consulting with appropriate parties at intergovernmental, national and provincial levels. Drinking water, sanitation, health and education have been identified by the East Rennell people as high priority areas for improvement. Work on these basic issues should continue at the same time that environmental and cultural awareness and education is progressing. Care should be taken to ensure that the people understand that assistance is being provided because they have chosen to sustainably manage their area.

## **5.6 Support Appropriate Small-Scale Development.**

Incentives for the East Rennell people for choosing sustainable development need to be visible. Support has been given to some small-scale developments that are environment friendly e.g. beekeeping, vegetable farming, poultry, bakery, sale of crafts, some furniture making, sea fisheries and ecotourism. Other opportunities for small businesses should be investigated as increased employment may alleviate some social problems with youth and continue to generate support for the sustainable management of the area.

## **5.7 Participatory Preparation of Management Plan.**

The management plan is most likely to be effective if it is developed with full participation of the local people. Workshops will be held in the area as a means of enabling local people to contribute their views and should follow after the environmental drama performances (involving local youth) which serve to raise issues. Even when strong management action is required, many levels of protection and human use are possible and the full range of these, such as zoning, will be discussed in an open manner. A draft plan will be developed from the workshops and be circulated and fine-tuned to suit the East Rennell situation so that it has the agreement of the local people.

## **5.8 Enforcement of Restrictions.**

Once it has been agreed on with the local people that certain restrictions (which may be those that existed when the local culture was stronger) are desirable and necessary, the regulations need to be strictly and equitably enforced. Enforcement should, where ever possible, be administered by local people and a portion of any fines should go back to the village.

## **5.9 Build Conservation into the Evolving Culture.**

Conservation needs to become integrated into the national development process and so become part of the new national culture rather than the responsibility of a government department. At the same time schools need to have flexibility in the curriculum so that they can incorporate material that is relevant to their area. New efforts are required to place a value on cultural diversity and the adaptiveness of local cultures to local environmental conditions. Environmental awareness and education programmes are needed to show that protection of critical natural areas helps support food production outside those areas by watershed protection, soil formation, provision of microclimates and conservation of genetic resources.

## **5.10 Value Diversity.**

It has long been recognised that diversity is the key to human survival and over time, people have used a wide range of plant and animal species to exist. Mixed systems with built soils, agroforestry, use of local plant varieties, hunting and fishing and the plantation-agriculture-wilderness interface are essential to most cultures. This diversity needs to be maintained as a matter of highest importance. What works on one island will not necessarily work on the next. What is required is a series of local adaptations of land management practices that are based on local culture and the local environment. There will be no universal solution to solve all conservation problems. Within these areas there will remain some original habitat and genetic stock. The prime consideration should be that people are part of the environment and wherever possible, should try to maintain a balance with nature. This will be the goal for the long-term management of East Rennell.

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## **Attachment 2**

### **OUTLINE OF EAST RENNELL RESOURCE MANAGEMENT PLAN :**

#### **1. Form of the Resource Management Plan ( RMP ).**

The RMP will be based on a large picture drawn by a local artist that shows "the ideal East Rennell environment". It will be a written version of what the customary landowners consider to be their management objectives and plans for the area and it will be largely based on traditional management practices. It will specifically address problems that have arisen recently through introduction of modern technology eg. guns and nylon fishing nets and having improved access to East Rennell.

It will be developed in a participatory manner and will involve the traditional leaders ie. the Paramount Chief and Council of Chiefs and modern management committees eg. Provincial Government, Church, Women and Youth Group leaders as well as resource owners and other members of the community. A draft RMP will be written, circulated and modified. The timetable for completion of the RMP may be three to four years. It will be a slow process because of the consultations that will be required. When it is completed to the satisfaction of the East Rennell community, there will be a ceremony to "action " the RMP and this will involve the signing of the picture by the different leaders and community groups that represent East Rennell.

#### **2. Who is the Resource Management Plan for ?**

The RMP is for the people of East Rennell to assist them to sustainably manage their resources. It will reinforce customary law while acknowledging modern requirements. The Tegano Management and Conservation Committee ( TMCC ) will assist in this area and have a local environmental impact assessment function and the main responsibility for implementing the RMP.

Copies of the RMP will be provided for the Provincial Government and medium scale developments could be screened at this level so that all proposals comply with standards set in the RMP.

#### **3. How will the Resource Management Plan be used ?**

The RMP will set rules for resource use where resources are under threat. It will be flexible so that it can be modified and added to, as needs arise. It will state penalties and the process for enforcing the regulations and it will build on existing local enforcement structures. There will be a process for reviewing areas of the RMP and a representative from the Ministry of Forestry, Environment and Conservation will be asked to act as chairperson. Village people and resource owners will be able to request the Tegano Management and Conservation Committee, Paramount Chief and Council of Chiefs, to add to, delete or reconsider resource management regulations during the review process.

During development of the plan, details like the regularity of reviews, roles of the Paramount Chief, Council of Chiefs and Tegano Management and Conservation Committee will be established. These decisions must be made by the people of East Rennell. The World Heritage / Ecotourism Project will provide guidance and

assistance as needed through the process of developing the RMP. It will also assist with environmental awareness and education so that monitoring can be done by East Rennellese and so they can evaluate whether the RMP is working as it should.

### **PROCESS FOR DEVELOPING THE RESOURCE MANAGEMENT PLAN :**

The East Rennell Drama Group will prepare performances that raise environmental issues. These will be followed by discussions to consider management options. Concurrently, there will be dialogue with the elders to acknowledge and record the traditional management systems which have kept the environment in very good condition. Using traditional knowledge and addressing specific issues, sections of the draft RMP will be prepared that cover separate environments;

- Lake Tegano,
- the land, (which includes villages, gardens and the forest) and
- the reef and sea.

The draft RMP for Lake Tegano will be outlined in meetings firstly with the Paramount Chief, Council of Chiefs and TMCC, followed by village meetings with men, women and youth. After the time period needed by the community to consider the draft, comments would be sought and modifications made. The process would be repeated to cover all the environments. While this is happening, there will also be an Environmental and Cultural Awareness and Education Programme taking place. This will improve the knowledge and understanding of environmental and cultural issues and will lead to environmental monitoring by the local people.

### **MAIN FEATURES :**

1. Picture of "East Rennell ideal environment" as basis for RMP.
2. Use of drama in Rennellese language to engage most of the population.
3. The RMP will be based on the traditional management system.
4. The RMP will be developed using a participatory process. It is likely to be slow but it must progress at a rate that suits the village people.
5. Local ownership will ideally be achieved through widespread participation in development of the RMP and an on-going awareness and education programme.
6. Enforcement of the RMP will build on local enforcement structures.
7. Modifications can be made. There will be review and support systems in place if assistance is needed.

### **LOCAL COMMITMENT :**

The local communities at East Rennell have asked for assistance in the development of a RMP. Their goal is to achieve sustainable management of resources and the development of the RMP is a major step towards this.

**Attachment 3**

*World Heritage  
/Ecotourism  
Programme*

*Draft Project  
Implementation  
Document*

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*August 1998*



# Abbreviations

APC	Assistant Project Coordinator
AusAID	Australian Agency for International Development
CoC	Council of Chiefs
KAP	Knowledge, attitude and practices
DPM	Development Programme Manager
MFAT	Ministry of Foreign Affairs and Trade
MSC	Management Services Consultancy
NZHC	New Zealand High Commission
PC	Project Coordinator
PD	Project Director
PID	Project Implementation Document
PRA	Participatory Rural Appraisal
NGOs	Non Governmental Organisations
NZODA	New Zealand Official Development Assistance
PM	Project Manager
PMC	Project Management Committee
SBEC	Small Business Enterprise Centre
SIGOV	Solomon Island Government
SIVB	Solomon Islands Visitors Bureau
TA	Technical Advisor
TCSP	Tourism Council of the South Pacific
TMCC	Tegano Management and Conservation Committee
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
WAESP	Women's Agriculture Extension Services Project
WH	World Heritage
WHEP	World Heritage / Ecotourism Project
WHB	World Heritage Bureau
WWF	World Wide Fund for Nature

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# 1. INTRODUCTION:

## 1.1 Background:

The World Heritage Project began in 1988 and in 1989 the Solomon Island Government gave cabinet support in principle for World Heritage listing of Lake Tegano on Rennell and Marovo Lagoon and approved application for membership of the World Heritage Convention. In 1992 the Solomon Islands became a member of the Convention.

Since the project began, it has had eight Consultancy reports that were mainly the result of short-term assignments. The reports given in chronological order outline the gradual development of the project. They are;

- Darby, d'E. C. (1989) Rennell Island and Marovo Lagoon: A Proposal by Solomon Islands for World Heritage Site Listing as the Basis of a Sustainable Rural Development Programme.
- McKinnon, J. (1990) Solomon Islands World Heritage Site Proposal: Fact Finding Mission 4 - 22 February 1990.
- Lucas, P.H.C. (1991) Report on Consultancy to Advise the Solomon Islands Government on Implications of World Heritage Convention, 11 - 16 March, 1991.
- Darby, d'E. C. (1992) Solomon World Heritage Programme.
- Lees, A. and Evans, B. (1993) World Heritage Marovo Lagoon and Rennell Island Project Document.
- Massey, C. (1994) Strategic Management Plan: Programme Implementation, Solomon Islands.
- Greenaway, R. (1995) Ecotourism Planning for Marovo Lagoon and Rennell Island, Solomon Islands: Draft Ecotourism Plan: World Heritage Programme.
- Sheehan, N. (1995) Income Generating Activities Projects Plan for Marovo Lagoon and Rennell Island: Draft: World Heritage Programme.

In Sept. 1994, the New Zealand Ministry of Foreign Affairs and Trade (MFAT) appointed a Project Manager to work with a Solomon Island Government counterpart and to be based in country for two years. The people selected were Dr. Elspeth Wingham and Mr Ben Devi. A World Heritage / Ecotourism Project Implementation Document (PID) to cover the time period, July 1995 - July 1998 was prepared and implementation began in October 1995. The project was internally reviewed by MFAT and Solomon Island Government (SIGOV) staff in October 1996. Members of the team were; Mr Roger Cornforth, Environmental Specialist; Mrs Martina Ului, Manager for Women's Agricultural Extension Services Project (WAESP) and Mr Donald Kudu, Permanent Secretary for Ministry of Development and Planning. Recommendations made by the Review Team were incorporated into the work plan for 1997.

In 1997 a Management Services Consultancy (MSC) was awarded to Dr Elspeth Wingham and Mr John Preece as in-country Technical Advisor for the project. As the implementation phase was nearing completion, a "Phase II Design Study" was made with external input from Mr Les Clark (Tourism Resource Consultants) and Mr Matthew Abel (Small Business and Marketing Consultant). The purpose of the Design Study was to determine the project direction for the next three years.

Information for tendering for the current MSC was sent to selected firms and consultants by MFAT. Interviews to select the MSC were held in April 1998. The MSC was awarded to the team proposed by Lincoln International. The MSC Team will act as advisors and will co-ordinate New Zealand Official Development Assistance(NZODA) inputs into the World Heritage / Ecotourism Project(WHEP). The team members are;

- Mr Stewart Hadfield - Project Director(PD)
- Dr Elspeth Wingham - Project Coordinator(PC)
- Mr John Preece - Assistant Project Coordinator(APC)

## 1.2 Project Setting:

### 1.2.1 National Perspective.

The Solomon Islands economy has been dominated by the forestry sector which contributed around 50% of total exports and 50% of government revenue (in 1997). A major concern in the country is the unsustainable exploitation of the forestry resource and similar concerns also apply to fishing exports, which account for approximately 25 % of exports. Currently the country is only partially servicing its domestic and external debt. Although government salaries are still being met, there is a serious shortfall in recurrent expenditure for the repairs and maintenance of assets and to enable government officials to properly perform their tasks. The Solomon Island Government's cash flow problems are unlikely to ease for some time and there is likely to be further restrictions on government spending and staff numbers.

The predominant lifestyle in the Solomon Islands, for approximately 85 % of the population is subsistence farming. Most of the population is located in villages which have varying levels of basic services. There is a gradual transition occurring at village level as people move from bartering to a cash economy. Over time more goods and services, such as education and visits to the health clinic, require payments in cash.

Population growth rate is the second highest for the world and is leading to pressure on resources. Most of the land and reefs are under customary ownership making protection of special areas complex. Legislative measures do not exist to protect vital areas of the environment such as water catchments and areas rich in biodiversity. In some areas, plants and animals are being lost and the environment being spoiled before the customary owners are aware of the long-term consequences of their actions.

Ecotourism is seen as one means of protecting an area and providing the customary owners with an income. The number of tourists visiting the Solomon Islands has stayed steady for the past five years at about 10,000 annually. There are considerable possibilities for expanding this area of the economy.

### 1.2.2 Administrative Setting:

The administrative authority for the project is the Ministry of Commerce, Employment and Tourism. The Solomon Island Project Manager is Mr Ben Devi.

## 1.3 Rationale:

New Zealand currently has two World Heritage sites and was requested to assist the Solomon Island Government with the procedures for listing of sites. New Zealand became the sponsor country and nominated the Solomon Islands to become a State Party to the World Heritage Convention.

Both proposed World Heritage sites are under customary ownership. For these areas to remain in good condition there must be support from the customary owners. To achieve this, it will be necessary to establish a sustainable development programme through a participatory process. The purpose will be to identify and meet the needs of the local people as well as achieve sustainable management for these two environmentally unique areas. As an alternative to extractive resource use and as an incentive for choosing to have their area listed as a World Heritage site, income-generating activities such as small businesses and ecotourism are being developed.

## 1.4 Approach:

For both proposed World Heritage sites, the project will work with the existing administration at Ministry, Provincial Government and Area Council levels. It will also work with the traditional leaders and the Church. The project will endeavour to establish links and collaborate with other government projects, aid donors and NGO's that have similar sustainable development goals. This networking should be fostered for all layers of the project namely; ecotourism, conservation and small business. Links should also be made with similar projects and organisations outside the Solomon Islands with the purpose of sharing knowledge and increasing the exposure of the project internationally.

The project intends to employ local people where ever possible and use consultants / technical advisors when the skills needed cannot be sourced in the Solomon Islands. It is also intended that people with interests and skills in discrete project areas such as conservation, small business development, ecotourism etc., should be identified and given extra training. Over time, responsibility for these areas of the project will be given to Solomon Islanders who will increasingly manage the project.

Where ever possible the project will work with extended families when establishing businesses such as ecotourism lodges, where many different skills and jobs can be identified. Extended families appear to be the most cohesive social unit. In this way, participation by women and youth in business can be integrated socially and culturally. For women and youth to have genuine involvement in the project, their participation in all stages of project development, from planning to implementation, will be encouraged.

## 1.5 Reporting Requirements:

The MSC will report to the Solomon Island Government through the Project Management Committee (PMC). The PMC includes selected representatives from Solomon Island Government Ministries and a representative from each of the two proposed World Heritage sites. New Zealand is represented by the Deputy High Commissioner. The PMC will meet twice a year with additional meetings to be arranged as required. The MSC will be guided by this group.

The MSC will provide quarterly reports to MFAT. These will be passed by the Development Project Manager (DPM) for the Solomon Islands who is based in Wellington, through the New Zealand High Commission to the PMC for consideration. The same process will be followed for project planning documents.

## 1.6 Outline of the Project Implementation Document:

The PID has developed gradually and incorporates the internal review recommendations (June 1996), the Design Phase II Study (Oct. 1997), feedback from stakeholders, including women and youth, in both proposed World Heritage sites and advice from Solomon Island Government Ministry personnel and NGO's.

The PID considers the overall goal of the project and identifies the risks and constraints to achievement of the goal. In this process the objectives are identified and the outputs needed to achieve these objectives. Similarly, the risks and constraints to achieving these outputs generate the activities that are required to achieve them. The PID addresses the three components that comprise the project which are; World Heritage listing, environmental awareness and education, ecotourism and small business development and completes the logframe process for each one.

## 2. WORLD HERITAGE / ECOTOURISM PROJECT:

**PROJECT GOAL:** *To assist Solomon Islands with the conservation of its natural and cultural resources and the achievement of World Heritage listing for two of its outstanding natural areas, Marovo Lagoon and East Rennell.*

Although the project covers East Rennell and Marovo Lagoon, the goal for both areas is to attain World Heritage status and for sustainable development to occur. The biological and geographical features of the two areas are very different. Also culturally they are distinct with Polynesian people on East Rennell and Melanesian in Marovo Lagoon. For these reasons there are two distinct strategies for East Rennell and Marovo Lagoon.

The long-term sustainability of a World Heritage site that is in customary ownership depends on the will of the people. It is essential that the people have more environmental education so they are able to make informed decisions concerning management of natural resources. Also, by choosing to allow their area to be listed as a World Heritage site, the local people have agreed to follow sustainable development. They require assistance to identify and develop small businesses which are sustainable and not harmful to the environment.

At the same time, the people have basic needs that should be addressed. It is difficult for people to focus their attention on environmental and conservation matters when major issues affecting their lives such as water supply, sanitation, education and health, need attention.

It is important that the quality of life for people improves so it will act as a catalyst for other communities living in other areas where the environment is worthy of protection, to seek a similar model of sustainable development. The ideal outcome would be a long-term commitment by the people to manage and protect their natural resources and for them; greater value placed on traditional knowledge, improved quality of life and more options, especially for women and youth.

### 3. OBJECTIVES:

#### 3.1 WORLD HERITAGE

*To assist the Solomon Islands attain World Heritage listing for East Rennell and Marovo Lagoon.*

##### 3.1.1 BACKGROUND

To achieve World Heritage listing as a natural site, the area must have outstanding universal values. The Solomon Islands are fortunate within the Pacific Island nations in having two possible sites. In many Pacific countries, the environment has been degraded and they have no chance of listing any natural sites. The Pacific (excluding Australia and New Zealand) has three existing World Heritage sites to date. They are; Henderson Island (an uninhabited coral atoll), Easter Island (a cultural site) and Lord Howe Island (a natural site with many endemic plants).

If World Heritage listing is achieved for East Rennell, it will be the first natural site in the insular Pacific under customary ownership. This is highly significant and will be observed by other Pacific countries who experience similar problems when trying to protect areas that are under customary ownership. Listing of East Rennell would be a considerable achievement but the real test is if it can be maintained long term.

##### 3.1.2 CURRENT SITUATION:

###### **RENNELL**

Rennell is of outstanding universal value under World Heritage natural criterion ii and demonstrates significant on-going ecological and biological processes and is an important site for the science of island biogeography. These processes relate to the role of Rennell as a stepping stone in the migration and evolution of species in the Western Pacific and for speciation processes underway, especially with respect to the avifauna. Combined with the strong climatic effects of frequent cyclones, the site is a natural laboratory for scientific study.

Rennell was identified as a potential World Heritage site. The Council of Chiefs(CoC) of West Rennell asked not to be included in the World Heritage awareness programme as they wished to consider other development options. At East Rennell there was support from the Paramount Chief for World Heritage and interest from some of the community. The area involved five villages and approximately 500 people. These factors helped to focus the programme on East Rennell to pursue World Heritage listing. Ideally, all of Rennell has the potential to be a World Heritage site and the programme should consider strategies should the people of West Rennell invite the programme to work there in the future.

After an extensive public awareness programme, the people of East Rennell gave their support in March 1997 for continuing the process of World Heritage listing. The nomination document was completed and submitted to the World Heritage Bureau, United Nations Educational, Scientific and Cultural Organisation (UNESCO), Paris in June 1997. Arrangements were made to facilitate and accompany the World Heritage Assessment Team, which visited East Rennell in February 1998. The



team comprised two people selected by the World Heritage Bureau. They will present their assessment to the World Heritage Bureau meeting in Paris in June 1998.

It is possible that following the Assessment Team's recommendations, the World Heritage Bureau may require further documentation or legislation before considering East Rennell for listing. These recommendations would need to be attended to urgently (before the end of September 1998) for a favourable decision to be made at the next World Heritage Bureau meeting in early December 1998, in Japan. It was suggested that an "East Rennell Resource Management: Objectives and Guidelines" document be prepared as the preparation of a resource management plan, as originally intended, will be a participatory process and is likely to take a long time. The draft document has been prepared (May 1998).

There is a need for an ongoing World Heritage Awareness Programme to provide information, especially at village level. There is still suspicion and doubt concerning land ownership and customary rights, and the effects World Heritage listing would have on these.

If East Rennell is listed in December 1998, celebrations and publicity will be appropriate. Events to mark this achievement will be planned with the NZHC, Solomon Island Government Ministers, National and Provincial politicians, Paramount Chief, Council of Chiefs, local organisations including Tegano Management and Conservation Committee (TMCC), Church leaders etc. Discussions at Government level should consider the type and extent of celebrations, a possible guest list, and planning should begin soon (Sept. to Nov. 1998).

In the long-term, Solomon Island Government Officers, working with East Rennell people, will manage the proposed World Heritage site. To achieve this, it is necessary to identify people at Government and local levels for additional training. Over time, more and more responsibility for management of the programme will be shifted to Solomon Island personnel.

### **MAROVO LAGOON:**

The area proposed as a World Heritage site in Marovo Lagoon is much larger than East Rennell and has 54 villages and approximately 8,500 people. There are 16 butubutu or clans which control areas of land and reef and contain villages with genealogical links. There is no Chief who holds authority over the whole area. The logistical difficulties in implementing a public awareness programme to cover all the villages would be considerable. Also the need to identify the appropriate strategy to achieve World Heritage listing for Marovo Lagoon made it a lesser priority at that time when logging and other extractive businesses were becoming established in the area.

In Marovo Lagoon in particular, there has been misinformation and political interference in the World Heritage project to the extent that the project withdrew from the area in 1994. Since then there has been a slow process of establishing trust and educating people about the project. There is still a persistent belief that it is not possible for Marovo to achieve listing because of the logging that has occurred. This is not true because the unique features of Marovo Lagoon are geographical and the integrity of the forests would form part of the supporting arguments. Naturally, the better the condition of the environment for the whole area, the stronger the case for listing.

The current World Heritage strategy for Marovo Lagoon has arisen from the local people. Leaders of two butubutu have asked for assistance from the project to achieve protection for their areas that would be recognised in court. The people within these areas would also like assistance to prepare

plans for sustainable development and help to identify and establish appropriate small businesses. These conditions fit the requirements for World Heritage and it is hoped that by working with these two communities initially, other butubutu will ask to join the project. It is possible that the project may achieve a mosaic of protected and unprotected areas in Marovo Lagoon. If all the butubutu join the project, there would be a high likelihood of achieving World Heritage listing. This is likely to require a long-term involvement by the project.

Considerable time and effort is required to collect reference material, analyse, compile and write the nomination document. Although some material has been collected for Marovo Lagoon, it has not been intensively researched and this is an essential task. It has the important spin-off of providing material for ecotourism interpretation.

### 3.1.3 Activities

#### Outputs

#### Activities

##### Output 1.1

To gain support from the people and Governments of the two areas for World Heritage.

##### Activity 1.1.1

*World Heritage strategy developed and implemented.*

The PC and APC will prepare a World Heritage Awareness Strategy. Details of implementation will depend on strategy chosen but are likely to include on-going village meetings at Rennell and with Marovo Lagoon communities. Preparation of an information sheet about World Heritage and the project will also be undertaken to counter misinformation and misunderstanding. The desired outcome is a mandate from the people of Rennell and Marovo Lagoon to seek World Heritage listing.

##### Output 1.2

To meet the requirements of the World Heritage Bureau for the listing process.

##### Activity 1.2.1

*Research, compilation, production and provision of nomination documentation to World Heritage Bureau.*

A consultancy for the preparation of a draft nomination document for Marovo Lagoon would be an efficient way to collate the existing reference material. It would establish the information gaps, identify key slides that would be needed for the nomination document and to be presented at the World Heritage Headquarters. This may involve arranging for a professional photographer to visit Marovo Lagoon. The document would be prepared so that it was in a format that could easily be revised and updated prior to submitting the document to the World Heritage Bureau. Specialist advice on the nomination document when it is ready for peer review is likely to be needed. Collecting the existing reference material and slides will also benefit the production of interpretation / information brochures for ecotourists.

##### Activity 1.2.2

*Provision of Technical Assistance at local, provincial and national levels to formulate regulations or other requirements as notified.*

Depending on the requirements of the World Heritage Bureau, a consultancy may be needed to provide extra information, documentation or legislation to support the application for World Heritage listing.

##### Activity 1.2.3

*Assist / fund / advise on publicity attached to the listing of a site.*

The World Heritage Bureau has specifications for signage and there should be a plaque to mark a World Heritage site. Use of the World Heritage logo and the wording must be approved. The local people would like a feast with important dignitaries to attend. Other possible publicity events are; issue of a World Heritage postage stamp, commemorative T-shirts, production of brochures, posters and post cards. A short consultancy to investigate publicity opportunities and to assist with the planning of the celebration may be appropriate.

## 3.2 SUSTAINABLE RESOURCE MANAGEMENT

*To achieve sustainable resource management within the project areas.*

### 3.2.1 BACKGROUND

Although the communities have lived in Marovo Lagoon for thousands of years and at Rennell for around one thousand years, it is only recently that they have had the ability or desire to substantially alter the environment. Factors such as population pressure, the development of a cash economy and modern machinery have assisted this. Initially there was encouragement to clear land for agricultural projects such as cattle, copra and cocoa. These projects are less popular now. Currently there is pressure on communities seeking income, to harvest commercially valuable marine and forest resources. Often this harvesting concentrates on a species or group such as coconut crab or clams and can very quickly lead to the local extinction of that resource. Similarly, targeted harvesting of valuable forest trees can upset the forest ecology in ways that may not be evident for many years. Often the long-term effects of allowing logging or entering fisheries agreements are not understood by the community when they are asked to make decisions on resource use. Also many traditional constraints on resource harvesting were beneficial for wise management of the resources. This traditional knowledge needs to be recorded and incorporated into modern resource management methods.

The people have basic needs that should be addressed. It is difficult for people to focus their attention on environmental and conservation matters when major issues affecting their lives such as water supply, sanitation, education and health, need attention.

The intention of this objective is to raise conservation and cultural awareness and improve environmental knowledge within the communities on Rennell and at Marovo Lagoon so that they can make informed decisions about resource use and eventually produce resource management plans for their areas. Wherever appropriate the incorporation of traditional knowledge and methods will be encouraged.

### 3.2.2 CURRENT SITUATION:

#### **EAST RENNELL**

Following participatory rural appraisal (PRA) surveys at three East Rennell villages, it was clear that the village people required some basic needs to be met. They had identified their needs and prioritised them and the environment was not their greatest concern. They identified water supply, sanitation, education and health as major issues and until these are improved, they will continue to cause hardship for the people. The project does not intend to directly provide these services but rather to facilitate the delivery of these by other national, aid and donor programmes that cover these issues.

Although there have been eight major scientific expeditions to Rennell, there is only one monitoring study that has involved repeat visits. An ornithologist (J.M.Pegler) has made annual fortnightly visits to Rennell since 1991. Her information is of considerable interest because it documents the impact of cyclone Nina in 1993 and the recovery of the bird population. Key animal and plant species need

to be identified and baseline population surveys made. For vegetation cover, access to aerial photography is needed and this may be possible through the Australian Air Force records. A full environmental monitoring and evaluation programme will need to be designed to monitor changes and to see if the resource management plan is working.

The environment on East Rennell is in very good condition partly through lack of population pressure and from wise use through traditional management practices. There are some resources such as coconut crabs that are threatened because they have monetary value. Some village people have noticed the decrease in numbers and in size of animals and are concerned. There are a few similar resource use issues that need to be addressed by the East Rennell community.

The East Rennell Drama Group, which was trained under this project, has held a performance at most villages to raise environmental issues. This has proved highly successful because the performances are in Rennellese, everyone who is fit attends and the performers are mainly young people who are outside the Church. The project has community support to prepare a resource management plan which will be based on traditional management practices. An "East Rennell Resource Management: Objectives and Guidelines" document has been prepared which will guide this process.

The project strategy to help prepare an East Rennell Resource Management Plan will involve a participatory process and may take three to four years depending on the time village people have available to assist with this and the priority they give it. It should be noted that there has not been environmental education programmes held on Rennell by NGOs and while there is concern about extractive resource use, there is little understanding of biology or the relationships between over-harvesting of resources and environmental depredation and damage. The Tegano Management and Conservation Committee (TMCC) will be involved in the preparation of the resource management plan and members may need extra training to help them in their role to screen development proposals and to provide long-term protection for the environment.

## **MAROVO LAGOON**

The environment at Marovo Lagoon is under threat from logging, fishing and mining companies. Often the village people are offered bribes or are not given full information on their rights or on what they are signing. The local people report that all members of the Marovo Area Council support logging and so there is often trickery between Marovo people as well as foreigners.

NGOs such as Solomon Island Development Trust (SIDT) and World Wide Fund for Nature (WWF), have been providing environmental education in Marovo for some years. It is not a great success because the village people still need money for school fees, visits to the Health Clinic, kerosene and so on. Often these programmes are seen as preaching and the people now want practical ways to make some money and look after their environment.

The World Heritage Project has not held environmental education workshops in Marovo Lagoon. Instead the strategy has been to establish seven ecotourism lodges to show that it is possible to generate income and maintain the environment. This has indirectly led to a conservation initiative from two butubutu (clans). Two of the seven lodge owners have influenced their butubutu who have asked the project for assistance to sustainably manage their land. They would also like to have

their land protected in a manner that would be recognised in Court. They want to make it clear to developers that their clan has chosen to follow sustainable development on their land.

In time these butubutu want to develop resource management plans and this would follow a similar participatory process as outlined for East Rennell. To assist the butubutu gain legal protection for their land, a Legal Advisor may be required to investigate how this could best be achieved.

Participatory rural appraisal surveys have not been made in the two butubutu. It may show that there are basic needs in these Marovo villages that require attention and again, the project would take on the role of facilitator.

An environmental monitoring and evaluation programme will need to be developed to cover the land and reefs controlled by the two butubutu. Key species will need to be identified and baseline data on populations collected. Marovo Lagoon has a rich variety of environments so careful planning will be needed to ensure that all critical biological zones are monitored.

There are a few individuals within the World Heritage project at Marovo who have an instinctive understanding of environmental processes and issues. Where ever possible, opportunities for further training of these people should be supported. The environmental monitoring programme will provide an opportunity to train people in recognising environmental indicators as well as using their field skills to build up baseline information.

### 3.2.3 Activities

#### Outputs

##### Output 2.1

Increased environmental and cultural awareness and knowledge.

#### Activities

##### Activity 2.1.1

*Develop and implement environmental and cultural awareness and education programme.*

A KAP survey will be designed to assess the current environmental and cultural awareness of the local people at both project sites. This would be followed by village meetings to help prioritise their information needs and to find the best methods of delivery. A programme would need to be written to cover implementation at village level and training opportunities for individuals. The local “Environmental Officers” should be chosen by the communities and training should be coordinated with other existing environmental programmes to encourage networking and co-operation between areas in the Solomon Islands. Workshops for Provincial Government and local community leaders will consider results of KAP survey and RMP issues and will advise on process to be followed. There will also be a workshop for school teachers on Rennell to cover cultural and environmental issues.

##### Activity 2.1.2

*MSC and counterpart meetings with provincial and national decision-makers.*

Meetings should be held at least once a year with provincial and national government officials who have environmental and cultural responsibilities. The MSC and counterparts should brief them on the WH project and environmental and cultural issues affecting the project areas. It would also provide an opportunity for identifying areas for collaboration.

##### Activity 2.1.3

*MSC and local counterpart to cultivate, support and if necessary, train project “champions” at each level of government.*

For better understanding by the people of the Solomon Islands of the WH concept, individuals within the government who have shown an interest in the project, could help to promote WH and environmental awareness within their ministries. To achieve this, they may need training, support or advice on how linkages can be made to their ministry.

#### **Activity 2.1.4**

*Develop cultural survival / appreciation / support strategy.*

Traditional management practices were used in the past to look after the environment. These should be recorded and used or modified, where suitable to fit the resource management plans for the project areas. To foster interest in traditional culture and to raise environmental issues, use of the drama team is planned.

Other cultural skills such as weaving, story-telling, dancing, making fish traps, snares, water carriers etc. are known almost exclusively by the old people. To ensure that these cultural skills are not lost, there needs to be a programme that encourages the dissemination of these skills and recognises the value of the teachers and the skills. A strategy to record, teach, perform and value the cultural

features of the two project areas needs to be written and a programme to implement it. Staff from the Ministry of Culture would be invited to assist with this.

#### **Output 2.2**

Baseline survey and ongoing monitoring and evaluation of the knowledge, attitudes and practices of the people involved.

#### **Activity 2.2.1**

*Design, test and conduct Knowledge, Attitude and Practices ( KAP ) baseline survey on the Environment..*

P.C. and A.P.C. to design KAP and pre-test survey. If necessary, it will need to be amended. Purpose of survey will need to be explained to respondents and enumerators trained (see Activity 2.1.1).

#### **Output 2.3**

To assist with meeting basic development needs of villagers in project areas.

#### **Activity 2.3.1**

*Analysis and continuation of PRA surveys and gender disaggregated meetings.* PRA's designed to include socio-economic monitoring.

Some raw data from PRA's at East Rennell still needs to be written up (and accessed from student who collected some of the data). Other PRA's need to be designed, carried out and analysed eg. sea side villages at East Rennell and at the two Marovo Lagoon communities. Local people should be trained to assist with this. PRA's will provide baseline socio-economic data and will need to be repeated in a few years to see the effect of the project.

Gender disaggregated meetings are standard procedure at East Rennell and this may apply in Marovo as well.

#### **Activity 2.3.2**

*Basic needs Identification and facilitation of delivery.*

Include a "Development Needs Assessment" into the PRA survey and where possible have the village people prioritise their needs. The MSC and counterpart will work together to find existing programmes that would provide basic needs. They would also facilitate meetings or contacts to further the process.

Other projects should also be aware of the WH/ E and what assistance can be provided within the project.



### **Activity 2.3.3**

*Liaising with National and Provincial Planning Officers and formation of linkages to other projects.*

MSC and counterpart to regularly meet with officers in Planning Departments to keep them informed regarding the project and linkages made with other programmes. MSC and counterpart to make contact with appropriate programmes that could assist village people. These may be within the Solomon Island Government, the Provincial Government, NGOs or from international aid donors such as NZODA and AusAID.

### **Activity 2.3.4**

*Identify and address limiting factors.*

Through village meetings and discussions with local co-ordinators, bottlenecks such as insufficient school text books and inoculations unavailable because the refrigerator unit has broken, should be identified and appropriate funding or action can be taken.

## **Output 2.4**

Environmental monitoring.

### **Activity 2.4.1**

*Design and implement environmental monitoring programme.*

P.C. and A.P.C. to identify key environments and develop a strategy to monitor them using appropriate techniques eg. aerial photography for forest and mangrove cover, water sampling for Lake Tegano and coral transects for reefs in both project areas. Where ever possible local people should be trained to do basic monitoring after more detailed baseline studies have been made and analysed. Also working with other government departments or agencies should be encouraged to foster co-operation and to increase the knowledge and skills base for all of the Solomon's. Specialists may be required on short-term contracts to do some of the baseline surveys. These include an ecological survey of terrestrial vertebrate and invertebrate fauna, a survey of endangered species, a botanical survey, a survey of reef resources and the lake vertebrate and invertebrate fauna. With this information, the RMP will become more effective in conservation and sustainable management of resources.

## **Output 2.5**

Assist communities in establishing "Sustainable Development Areas".

### **Activity 2.5.1**

*Assist with appropriate "mechanisms" for committed communities.*

A Legal Advisor will be needed on a short-term contract to investigate the best methods for protecting customary land for sustainable development purposes (ie) to prevent extractive resource use. The mechanisms recommended must be recognised in Court. They may also be required to prepare environmental ordinances for the Provincial Governments in the two project areas.

**Activity 2.5.2***Assist in the development of resource management plans.*

By working with communities and their elected committees, it is hoped that through a participatory process, a resource management plan for the East Rennell area and the areas controlled by the two Marovo butubutu, can be developed. Village meetings would be needed to explain the concept. Initially a draft would be prepared and circulated for comment and change. The plan must be as close as possible to the traditional resource management practices so the local people identify with it. Local people must be involved and support the roles of local committees and the traditional structure that contribute to the process because they will be enforcing the plan. When the resource management plan has been prepared, there should be some “actioning ceremony” and it should be reviewed annually, if this is required by the East Rennell people. Ideally the reviews would be chaired by a representative from the Ministry of Forestry, Environment and Conservation and be flexible and responsive to changing needs.

## 3.3 INCOME GENERATING OPPORTUNITIES

*To develop income generating opportunities that are sustainable and provide an alternative to extractive resource use.*

### 3.3.1 BACKGROUND

It should be noted that the small business component of the project is the area that is of most interest to local people. Some people are interested in looking after the environment but they all require a means to make money. It is hoped that the benefits from small business development will include:

- Increased employment opportunities for youth
- Income generating opportunities for women
- Improved standard of living for village people
- Equitable sharing of benefits to the communities involved

Some of the barriers to this happening are cultural. Women and some youth are already busy with families and gardens and it is not the intention of the project to further burden them.

In 1994 when a workshop was held in Marovo Lagoon to discuss ecotourism and small business opportunities, the village people were asked what they would consider to be a successful small business. They replied that a project generating a profit of \$2,500 to \$3,000 SBD would be successful. They identified the major expense for most families as school fees. They also made it clear that they have other demands on their time like gardening and a-day-a-week working for the Church. The small businesses would need to be part-time and they felt that the main social unit that the project should deal with was extended families and not co-operatives or community projects.

The village people also considered that their culture was the greatest barrier to the success of small businesses. They cited jealousy as being a problem when one family is seen to be doing better than another and jealousy often leads to copy cat businesses, land disputes, physical violence and property damage.

Generally the people have little understanding of how to manage a small business and business practices generally. This has been made more difficult in both project areas by the banks closing down branches. The concept of separating business and family money needs to be made clear and any business training must consider cultural issues. Training is needed at two levels; for the people running the small businesses and at village level so the cultural problems can be discussed openly. For all the small businesses, training is required and some workshops have been held in the project areas eg. United Nations Development Programme (UNDP) has funded two small business workshops in Marovo Lagoon and the Ministry of Commerce provided a workshop at East Rennell (funded by the project). These were appreciated and there have been requests for more of these workshops.

The people at East Rennell and at two butubutu in Marovo Lagoon have chosen to follow sustainable development for their land and reefs. They require assistance to identify and establish small businesses which are sustainable and are not harmful to the environment. Ideally the people

would contribute perhaps fifty percent of the cost of materials. In the case of the East Rennell people, they had very little cash and few possibilities for raising cash. Their contribution is the physical work involved in for eg. building an ecotourism lodge. Until PRA surveys are done for the Marovo Lagoon butubutu, it is not possible to say what their contribution will be to establish a small business.

### 3.3.2 CURRENT SITUATION

#### **EAST RENNELL**

Five small ecotourism lodges are currently being built at East Rennell. There are already two existing lodges and these cater for the few tourists who currently visit Rennell. The local people have unrealistic expectations for ecotourism and think that World Heritage listing will bring many more tourists. It will be a marketing point but East Rennell will appeal to only a small segment of the tourism market eg. ornithologists and botanists in particular. East Rennell will require target marketing but before then, training in hospitality, cooking, hygiene and guiding are needed.

There are opportunities for developing pelagic fisheries and adding value to fish through smoking, is a possibility. This would provide employment for youth and is sustainable. More investigation into developing this fisheries opportunity is recommended.

A range of small businesses was identified as being sustainable and compatible with World Heritage ideals. They were; fishing projects for youth, bee keeping, poultry, furniture making (for local market and lodges), bakery, craft and carving sales, a water taxi, ecotourism lodges, a restaurant and vegetable production. At the four lakeside villages, there are some of these small businesses in operation or they are waiting for materials or training. The materials were not all available when a shipment was made in late 1997. The project has been "on hold" since then and this is causing frustration with the local East Rennell people. There is no regular shipping of freight to and from Rennell and this has caused delays. It will also restrict what businesses can be established.

The people have had little experience of business and are likely to need on-going training and support to run their small businesses.

#### **Marovo Lagoon**

The project has developed a network of seven ecotourism lodges in Marovo Lagoon. Some of these were developed from the concept stage and others were already operating. The lodge owners and their families have formed a Marovo Lagoon Ecotourism Association and all have been successfully operating for at least one and a half years. These lodges still need some materials for completion and business training especially to cover long-term planning to replace major items. The standard of service varies between lodges and more training in cooking, hygiene etc. and small business management is required. The lodges where they do not have their own canoes and outboard motors are at a disadvantage. They are often held to ransom by the person providing transport and this cost must be passed on to the tourist. Ways of financing outboard motors should be investigated.

Some other small businesses that support ecotourism have been set-up eg. water taxi and vegetable production. There is considerable interest in kayaking and by linking kayak tours to the lodges, this will provide the lodges with a steady flow of tourists. This small business is very close to operating. In September 1997 tour guide and safety training for guides was provided and there are seven completed kayaks ready for use. The safety gear and equipment at the moment is incomplete and the guides will need someone on hand when they run their first tours. There are many other ecotourism activities that are waiting to be developed such as two and three day walks. If this is compatible with the development plan that the butubutu decide on, then these opportunities can be further investigated.

Other small business developments such as beekeeping and cane furniture production will be options for the butubutu to consider as part of their sustainable development plan. It is likely that the businesses identified on East Rennell will also be suitable for Marovo Lagoon.

### 3.3.3 Activities

#### Outputs

#### Activities

##### Output 3.1

Completion and / or development of ecotourism infrastructure.

##### Activity 3.1.1

*Completion of existing lodges.*

A.P.C. to work with lodge owners to list materials needed to complete lodges. Counterpart and lodge owners will need to organise purchasing and shipment of materials. A.P.C. and counterpart to assess critical items for sustainability of ecotourism lodges that are not funded by the project eg. canoes and outboard motors. Recommendations on how lodge owners can get assistance for these items should be made. A workshop which will include the Official Opening / Launching of the lodges is planned for late 1998 and should cover long term management, pricing, maintaining standards and establishing linkages with the Ministry, Visitors Bureau and the Marovo Lagoon Ecotourism Association. The Visitors Bureau will be able to assist with marketing internally and externally ( see 3.1.4 ).

##### Activity 3.1.2

*Restaurant and Lodge Service Training.*

Some areas for further training have been identified by tourists and the lodge operators. They are ;

1. First Aid including evacuation and emergency procedures,
2. Food preparation and cooking, and
3. Hygiene and waste disposal.

Where ever possible MSC and counterpart will use local trainers. Training needs will change and it is anticipated that training will be on-going component of the project.

##### Activity 3.1.3

*Build and develop operational Visitor Centres at East Rennell and Seghe, Marovo Lagoon.*

A number of steps are required to achieve this. The MSC and counterpart will endeavour to secure the land at both sites. This will involve preparation of a legal document for East Rennell. Design briefs for both sites will be given to an architect who will make site visits. After the plans have been approved by the Provincial Governments and local Area Councils, contracts will be given for timber supply and construction. A local person will be employed short-term to supervise the building of the Visitor Centres.

To ensure that the Visitor Centres are sustainable, business plans and a management structure will be prepared that allow for small businesses to be located in them. Also, to avoid recurrent costs, maintenance agreements with the small business operators, will be negotiated. There will also be an information role for the Visitor Centres and displays about World Heritage, sustainable development, ecotourism and local culture could be featured. At East Rennell, the people would like the Visitor Centre to serve as a library / reference centre for them with information on their culture and the environment. This should be supported and reference material should be

collected so that it can be transferred to the Visitor Centre when it is complete. Publicity and celebrations will be needed to mark the opening of the Visitor Centres. This will need more consideration nearer to completion.

#### **Activity 3.1.4**

##### *Marketing / Advertising.*

By working with the lodge owners and families, establish the capacity of the existing lodges. Develop a market strategy involving target marketing for East Rennell and if needed, use a short-term contract to complete this. Establish linkages with private enterprise, the Solomon Island Visitors Bureau ( SIVB ), the Tourism Council of the South Pacific (TCSP) and Solair and work with them to develop appropriate advertising material including an Internet presence.

To monitor quality of experience for tourists, and for lodge operators and the local community, suitable surveys need to be designed. This would indicate areas for further training and other services / experiences that could be developed. The lodge owners should keep accurate records of visitor numbers and length of stay so visitor trends can be analysed. It would also give feedback on the impact at village and community levels and indicate if changes need to be made.

#### **Activity 3.1.5**

##### *Visitor information / interpretation requirements.*

MSC and counterpart to establish information and interpretation needs and develop a programme to provide these. This will involve separate orders / contracts to develop and produce appropriate material such as display boards for Henderson Airport and the Solomon Island Visitors Bureau. Information should be available at the lodges and Visitor Centres to enhance the ecotourism experience. This could be a set of brochures. An information package for tourists going to East Rennell or Marovo Lagoon should be assembled and distributed at key places eg. the airport, SIVB, Visitor Centres and the New Zealand High Commission ( NZHC ).

#### **Activity 3.1.6**

##### *Completion of communication and transport systems.*

Although most of the lodges in Marovo Lagoon have radios, training on maintenance has not been provided. All radio operators within the project should have this training.

Transport is critical to the success of all the lodges. Solair may be able to operate the runways in Marovo Lagoon that had been used by Western Pacific Airlines. Their closure has isolated some of the lodges and made them more expensive due to the additional costs to get there. On East Rennell, the truck is essential for the operation of ecotourism lodges and links should be made with the Small Business Enterprise Centre ( SBEC ) to give the transport committee training and support. At both sites, water taxis have been identified as small businesses. They need business plans, set prices, a booking system and for East Rennell, safety equipment. When the

water taxis are in use, a list of other canoes and drivers that can be hired, will be needed.

#### **Activity 3.1.7**

*Identify and assist with limiting factors to tourism at a national level.*

MSC and counterpart to identify limiting factors and prepare a brief report for the Ministry of Tourism. Where possible the project should help to find solutions. Some of the limiting factors are ; lack of foreign currency exchange for all in-coming international flights, lack of plane seats for tourists and inconvenient departure and arrival times. Other areas to be considered are timetabling between international and domestic flights and lack of information about the Solomon Islands for tourists at an international level

### **Output 3.2**

Development of ecotourism activities.

#### **Activity 3.2.1**

*Kayak tour development.*

Tour guide and safety training for kayaking was given to eight local guides in September 1997. Six wooden kayaks have been built but some equipment still needs to be purchased. The APC and local guides will prepare itineraries for trialing with reduced rates on "training" tours. A business plan will need to be developed and a business management structure. On-going business management advice will be needed as the kayak touring develops and a base for operations, probably at Seghe, will need to be built. In time, it may be necessary to add to the fleet depending on demand. Marketing and bookings can be linked with the system being developed for the ecotourism lodges. Both ecotourism lodges and the kayaking tours will be able to communicate through the radio, ecotourism frequency.

#### **Activity 3.2.2**

*Development of walking opportunities.*

For the communities in Marovo Lagoon that are working with the WH / E project, walking tracks with tourism potential should be identified. The impact this would have on local people needs to be considered and meetings where advantages and disadvantages can be discussed, will need to be arranged. If the people choose to allow a walk through their land, then it would need to be trialed for suitability, a development plan made including provision of facilities and a business and management plan. This will need careful planning and participation at all stages by the local people because walks through customary land have not had a high success rate in the Solomon Islands.

#### **Activity 3.2.3**

*Development of other ecotourism and cultural tourism activities.*

There is enormous potential for theme trips in Marovo Lagoon and at East Rennell such as ; exploring the mangroves, ethno-botany tours, bird watching, traditional fishing trips, seasonal trips to turtle breeding areas, understanding each sites' geography, local history sites and cultural tours. Information brochures, marketing and specialised guide training would be needed to make these tours happen.



### **Output 3.3**

Development of sustainable small businesses.

#### **Activity 3.3.1**

*Culturally appropriate business models developed and provision of business training.*

Much interest has been shown in developing small businesses on East Rennell but there are few successful small businesses that can act as models. The reasons why some businesses are successful and many others fail should be examined with the East Rennell people as many of the issues relate to their culture. They will need to find ways that fit their culture and allow them to run a business. When their cultural constraints are understood, a discussion paper should be produced that records the issues. Business training that addresses these issues should follow for the small business operators.

#### **Activity 3.3.2**

*Provision of community business training / awareness.*

For the small businesses to be successful, the community also needs to understand about business and their responsibilities eg. for the running of the East Rennell truck. Also some cultural practices will destroy business so the community must choose ways to deal with these issues. A fun way to introduce this is through drama eg. the East Rennell Drama Group. The advantages of working with this group are; short plays can be performed by local people in language, it is entertaining and it draws a wide audience and hopefully will generate greater awareness.

#### **Activity 3.3.3**

*Assessment of sustainable small business opportunities; recommendations made and implemented.*

Work with small business advice providers to assess other sustainable small business opportunities and to find trainers if required. Help establish new small business ventures that fit WH requirements.

#### **Activity 3.3.4**

*Develop kayak manufacture business.*

A “basic” workshop on kayak building was held in Marovo Lagoon in September 1997. The quality of kayaks produced was very high but an “advanced” workshop is needed to make sure that the boat builders further improve their knowledge and skills. Another “basic” workshop is needed to increase the number of trained people available. Suitable designs for touring kayaks and paddles will need to be purchased for production. A business plan needs to be developed based on

1. producing kayaks for the tour business, and
2. kayaks for sale in Honiara and for overseas.

The marketing plan will need to consider a location in Honiara for displaying the kayaks eg. the Yacht Club. There will also need to be a brochure produced with design details, prices and an order form.

**Activity 3.3.5**

*Cottage industry development eg. crafts, T-shirt printing, candles and furniture wax.*

A number of people in Marovo Lagoon and East Rennell are already operating very small businesses that have no regular orders or facilities such as a bank, to manage their income. Some need set-up finance to purchase initial stock eg. T-shirt printing, although they have arranged a sales outlet. Assisting with marketing and helping them to plan ahead, are very real needs. Workshops to teach skills will be needed as well as on-going business training and support. Short term contracts will be needed for skills development and to look at other possible small businesses that are suitable for the two project areas.

**Activity 3.3.6**

*Implement agriculture and fisheries, small scale businesses (eg. poultry, bee keeping, vegetable production and youth fishing).*

APC and counterpart to complete purchases of materials for the small businesses that have been approved on East Rennell and later, for Marovo Lagoon. MSC and counterpart, working with the Government Departments, will organise workshops to improve the skills and knowledge of operators. They will also organise training so business plans can be prepared and provide on-going support as needed.

**Activity 3.3.7**

*Sustainable forestry and fishing options investigated.*

Sustainable forestry and fishing projects would provide youth employment. In the case of sustainable forestry, it shows that WH does not “lock up” resources. There may be a big future in the pelagic fishery around Rennell and this should be investigated because there are few, realistic income generating opportunities available there. Reports on the possible options for sustainable forestry and fishing should be prepared by specialists on short-term contracts.

## 3.4 Solomon Island Project Management

*To provide management for the project which efficiently facilitates achievement of activities.*

### 3.4.1 Background

From 1994 when NZODA appointed an in-country PM, the PM and counterpart jointly managed the project. When the management changed to a MSC in 1997, the TA and counterpart ran the day to day management of the Honiara office, including Solomon Island staff and maintenance of field equipment. The current MSC is New Zealand based and this necessitates the progressive transferral of these administrative and management tasks to the Solomon Island office. The current office is not well equipped and communication to and from New Zealand has been a problem. A separate phone line, installation of fax and e-mail connection should greatly improve this situation.

### 3.4.2 Current Situation

To efficiently manage the project, administrative tasks will have to be attended to regularly throughout the year. To assist with this, the MSC and counterpart will work together to establish systems to efficiently manage the project in the Solomon Islands. More of the day-to-day tasks will need to be attended to by the counterpart (or TA if this position is required).

The intention is to create a sustainable administration and management system with Solomon Island staff. To achieve this, the management structure, staffing requirements, and training needs must be identified. To achieve a sustainable and practical project administration for the future, these areas must be discussed with the SIGOV. Being aware of the monetary and staffing constraints that already face the Ministry, external funding for certain areas of the project may need to be considered in future.

Activities:

To be determined through consultation with the Ministry of Commerce, Employment and Tourism.



rec d 6/10 Jd

**MINISTRY OF COMMERCE, EMPLOYMENT AND TOURISM  
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Mr Bernd von Droste,  
Director,  
UNESCO World Heritage Centre,  
7 Place de Fontenoy,  
75352 Paris 07 SP  
France.

Our ref: 420/10/23

1st September 1998.

Dear sir,

**Nomination of the East Rennell, Solomon Islands for inscription on the World Heritage List.**

Thank you for your letter detailing the consideration given by the World Heritage Bureau at its' Ordinary Session held in Paris (22 -27 June, 1998) for listing of East Rennell, Solomon Islands as a natural heritage site. The possibility of cultural criteria also applying to the site was noted with interest and will be further investigated.

1. Further information was requested on progress towards development of a resource management plan, the timetable to achieve this and its implementation on East Rennell.

The East Rennell community members have agreed to the concept of World Heritage listing of their land which is under customary ownership. They understand that this allows for sustainable development. They have also agreed to the production of a resource management plan for the area. A document that describes the Objectives and Guidelines for use in the preparation of the resource management plan has been prepared (Attachment 1). This is part of the strategy that has been approved by the community including the Council of Chiefs and the Tengano Management and Conservation Committee. Preparation of a draft resource management plan will begin in late 1998. The full resource management plan will be developed through a participatory process over the next three to four years and its development would assist in maintaining the integrity of East Rennell if it achieves listing as a World Heritage site.

Also attached are two pages that outline the resource management plan and the process planned to prepare it (Attachment 2). In the "East Rennell Resource Management:

Objectives and Guidelines" document, there are references to activities that are planned on East Rennell under the World Heritage/ Ecotourism Project which is part of the bilateral aid programme between the New Zealand and Solomon Islands Governments. These activities are described more fully in the World Heritage/ Ecotourism Project Implementation Document which outlines how the activities will be implemented (Attachment 3 ).

2. Information was also requested by the World Heritage Bureau on the current status of the national World Heritage Protection Bill and steps by the Solomon Islands Government to ensure its adoption and implementation.

There is a preliminary draft World Heritage Protection Bill. It is not yet ready to proceed through the legislative process. But the Solomon Islands Government has committed itself to the protection of any World Heritage site when it became a State Party to the Convention. It should be emphasised that the proposed East Rennell World Heritage site is in customary land ownership and the long term wise management of the site will depend on the commitment made by the local people. (This has been addressed above with the resource management plan).

The Solomon Islands Cabinet is currently considering the Environment Bill proposed by the Ministry of Forestry, Environment and Conservation. This would further strengthen environmental controls and would work alongside the resource management plan prepared by the local people of East Rennell.

It should also be noted that the Solomon Islands Government recognises and respects the rights of customary land owners and customary law and this is acknowledged in the Constitution of the Solomon Islands and the Customs Recognition Act, 1995.

I hope this reply has provided the further information requested by the World Heritage Bureau.

Yours sincerely



Moses K Mose  
Permanent Secretary  
**Ministry of Commerce, Employment & Tourism.**





# RENNELL ISLAND

LUGHUGH  
BAY

PROPOSED EAST RENNELL WORLD HERITAGE AREA

KAGAVA BAY

TUHUGAGO BAY

LAKE TENGANO

- VILLAGE
- STEEP LAND
- FLAT LAND

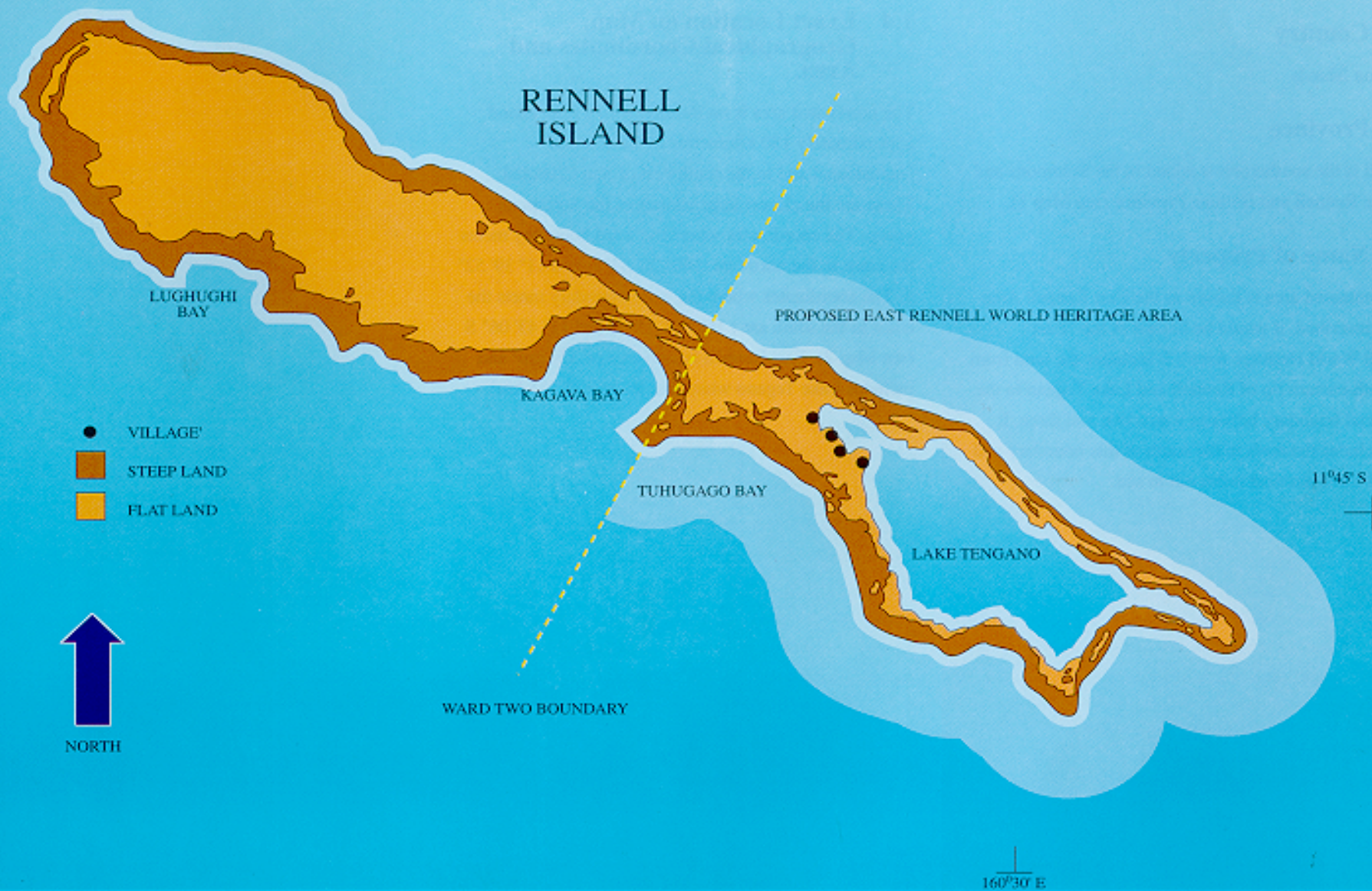
WARD TWO BOUNDARY

11°45' S



NORTH

160°30' E



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## WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

### EAST RENNELL (SOLOMON ISLANDS)

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#### 1. DOCUMENTATION

- (i) IUCN/WCMC Data Sheet ( 6 references)
- (ii) Additional Literature Consulted: Collins, N.M. *et. al.* Eds. 1991. **Conservation Atlas of Tropical Forests: Asia and the Pacific** IUCN/WCMC; Solomon Islands National Environmental Management Strategy. 1993. IUCN/SPREP/ADB 160p.; Davis S.D. *et. al.* Eds. 1995. **Centres of Plant Diversity** Vol. II. IUCN/WWF; Wingham, E. 1998. **Resource Management Objectives and Guidelines for East Rennell.** New Zealand ODA, 22p.
- (iii) Consultations: 10 external reviewers, Solomon Islands government officials, New Zealand Aid representatives, local community chiefs.
- (iv) Field Visit: Jim Thorsell and Les Molloy, February 1998.

#### 2. SUMMARY OF NATURAL VALUES

The nominated site of East Rennell (ER) is located on the southern third of Rennell Island which is the southernmost island in the Solomon Island group. Rennell, the largest raised coral atoll in the world is 86km long and 15 km wide and contains 87,500ha. The size of the area nominated is approximately 37,000ha plus a marine area that extends three nautical miles out to sea. Rennell Island has a tropical climate characterised by high uniform temperatures and humidity. Annual rainfall ranges between 3000-4000mm with a dry season from May to August. The island is subject to relatively frequent hurricanes which are a major factor affecting the island.

Rennell was formed by the uplift of corals which formed on an undersea ridge and then were subject to faulting. The landform is a typical jagged and eroded limestone karst rising to 200m. A major feature of the island is Lake Tegano which was the former lagoon on the atoll. The lake is the largest in the insular Pacific (15,500ha). It is brackish and contains many rugged limestone islands.

Rennell is mostly covered with dense forest with a canopy averaging 20m in height. The three main vegetation types are low scrub forest on the karst ridge, tall forest in the interior and beach flora along Lake Tegano. The lake's flora is dominated by 312 species of diatoms and algae a small number of which are endemic. There are 10 endemic plants on the island and its flora contains elements from the more impoverished Pacific islands to the east and the much richer Melanesian flora to the west.

Wildlife includes 11 species of bats, one of which is endemic, 43 bird species, four of which are endemic. An endemic banded sea snake lives in Lake Tegano. The invertebrate life is rich



with 27 species of land snails and 731 insect species. Very little information is available on the marine area.

Approximately 800 people of Polynesian origin reside in four villages within the nominated area. Subsistence agriculture, fishing and hunting are the bases of the economy. The local people rely on forest products for most construction materials. The land is under customary ownership and the lake is regarded as common property.

### **3. COMPARISON WITH OTHER AREAS**

Currently, 21 islands or portions of islands are inscribed on the World Heritage list including four in the Pacific (Lord Howe, Henderson, Galapagos and Hawaiian volcanoes). Other World Heritage islands are contained within the Great Barrier Reef Marine Park 1000km to the east of Rennell. There are 40 protected areas in the Papuan Biogeographical province, most occurring on the large island of New Guinea and the small islands surrounding it. In the wider context of the region, Rennell can be seen as a stepping-stone to the more distant Pacific islands to the east, all of which progressively decrease in biodiversity along a west to east gradient.

In the 1987 "Review of the protected Area system of Oceania" undertaken for IUCN and UNEP by A. Dahl, Rennell is rated in eighth place overall in terms of conservation importance but the most important one within the Solomon Island group. It is rated second to Guam in terms of conservation importance for raised coral atolls.

The distinguishing features of ER that are not duplicated elsewhere are:

- Rennell is the world's largest raised coral atoll. Throughout the Pacific there are about 25 such atolls, most of which have been significantly modified by human activity (except for Henderson Island World Heritage site which is one-tenth the size of Rennell but is more pristine);
- Lake Tegano is the largest lake in the insular Pacific and contains a number of endemic species (though not as many as the lakes in Palau);
- The forests of the nominated area are mostly undisturbed by humans and display a number of adaptations to the effects of the frequent cyclonic storms;
- For its size Rennell Island has a high number of endemic species, particularly birds. Along with 29 other islands in the Pacific, Rennell is listed as an endemic bird area by Birdlife International (though it is ranked in the third level in terms of priorities);
- Within the Pacific, most oceanic islands have been much modified by human activity. On Rennell, these impacts have been relatively light and invasive predators such as rats and alien land snails which have decimated the faunas of other islands, are absent.

In conclusion, ER has a number of marine, coastal and forest values that are better displayed in other Pacific locations. The fact, however, that ER combines them in one place and in a relatively undisturbed state, makes the island a special place in the Papuan Biogeographical Province.

## 4. INTEGRITY

There are three issues that need to be addressed regarding integrity: boundaries, customary land tenure, and local support for conservation.

### 4.1. Boundaries

Several reviewers questioned why the nomination was confined to only a portion of the island. The logic here is that integrity would be better maintained by protection of the entire uplifted atoll as the forest in ER is not sufficiently large (according to a study by J. Diamond) to ensure long-term survival of the endemic birds. Certainly previous proposals for mining and forest clearance on west Rennell would have some serious conservation consequences especially as there is no land use plan for the whole island. On the other hand, the local communities in west Rennell are not favourable to being included in the nomination at this time. Furthermore, the major features (particularly Lake Tegano) are in ER. Currently the prospect of an island-wide nomination is not feasible.

### 4.2. Customary Land Tenure

As is the case in most inhabited Pacific islands and elsewhere, land in Rennell is owned under the traditional customary system. This situation makes it difficult (but not impossible) for national government legislation to be effective in terms of management. Indeed in the case of ER, the ability of the central government to protect the site is limited. There is a draft World Heritage Protection Bill but no action has been taken to revise or enact the Bill. In any case, the customary ownership pattern in place on many islands can be more conducive to conservation than if the land was under control of a distant government office. This presumes that customary practices in place are favourable to protection and that traditional ownership powers and community support are not being eroded.

The Operational Guidelines for the Convention note that World Heritage natural sites "should have adequate long-term legislative, regulatory or institutional protection" (paragraph 44 vi). ER at the moment does not have this, although work is underway to provide it. First, (but of secondary importance) is expressed interest at the national level to revise and consider the passing of the World Heritage Protection Bill. This Act would not be interventionist but would provide an overarching national framework for heritage protection and reinforce the conservation objectives developed by the customary land owners.

Moreover, it is noted that the Operational Guidelines (para. 24 (b) (ii)) recognise "traditional protection and management mechanisms" as acceptable for World Heritage sites which meet cultural criteria but no similar provision exists for sites which meet natural criteria. Both the Sixth South Pacific Conference on Nature Conservation, 1979 and the Global Strategy Expert meeting in Amsterdam in March 1998 recommended that the Committee recognise traditional protection for sites which meet natural criteria.

Second, and most essential, is the process just begun by the local Management and Conservation Committee (MCC) to prepare a resource management plan

for ER. IUCN's view on this, and other similar situations, is that there needs to be some official document (as would be formally prepared by the MCC as representatives of the local residents), that provides an outline of the management objectives and prescriptions for protection of the site. Until this is available it is not possible to state how customary practices in fact will provide this protection.

4.3. Local Support for Conservation

IUCN was impressed during the field mission by statements from the local chiefs and paramount chief on their desire for sustainable development for ER. The World Heritage initiative is very much linked to the desire of the Rennellese people to encourage ecotourism in the area. This will require a significant amount of education, training and cooperative decision-making. It is expected that the preparation of the resource management plan under the MCC will further strengthen this local awareness and prepare for this economic activity.

## 5. ADDITIONAL COMMENTS

Much of the effort to promote conservation in ER has been undertaken with support provided by the New Zealand Government's Development Assistance Program. A similar project in the Marovo lagoon area may also result in a natural site nomination and the New Zealand Government should be commended for its assistance in promoting the conservation of such island ecosystems in the Pacific.

One reviewer has suggested that in terms of the history of the interaction of the traditional owners with Rennell that there might be value in considering the cultural landscape values of the site.

With regard to the marine component of the nomination, very little information is available. Further research into this dimension of the nominated area is required.

## 6. APPLICATION OF WORLD HERITAGE NATURAL CRITERIA

As discussed under the above section on comparison with other areas, ER does not particularly stand out for its dramatic scenery, biodiversity or geological values and IUCN considers that a convincing case for criteria i, iii, and iv is not made in the nomination. The main strength of the ER nomination lies in criterion ii, dealing with significant on-going ecological and biological processes that are evident on the island. ER is an important site for the science of island biogeography as reflected in the extensive studies conducted there by the University of Copenhagen and others. These processes relate to the role of ER as a stepping-stone in the migration and evolution of species in the western Pacific and for the speciation that is underway, especially with respect to the avifauna. Combined with the strong climate effects of frequent cyclones, ER is a true natural laboratory for scientific study.

The site is thus considered to meet criterion ii but the conditions of integrity in the Operational Guidelines are not yet met. Although customary land ownership should not preclude a site from consideration, IUCN suggests that an essential requirement would be a formal statement of objectives and management prescriptions. This is particularly required in the absence of any national legal framework that would reinforce the conservation goals of the traditional owners (although this should also preferably be available). Beyond the preparation of a local resource

management document and the passage of a national law, much needs to be put in place in terms of training, education, boundary marking and other basic management activities.

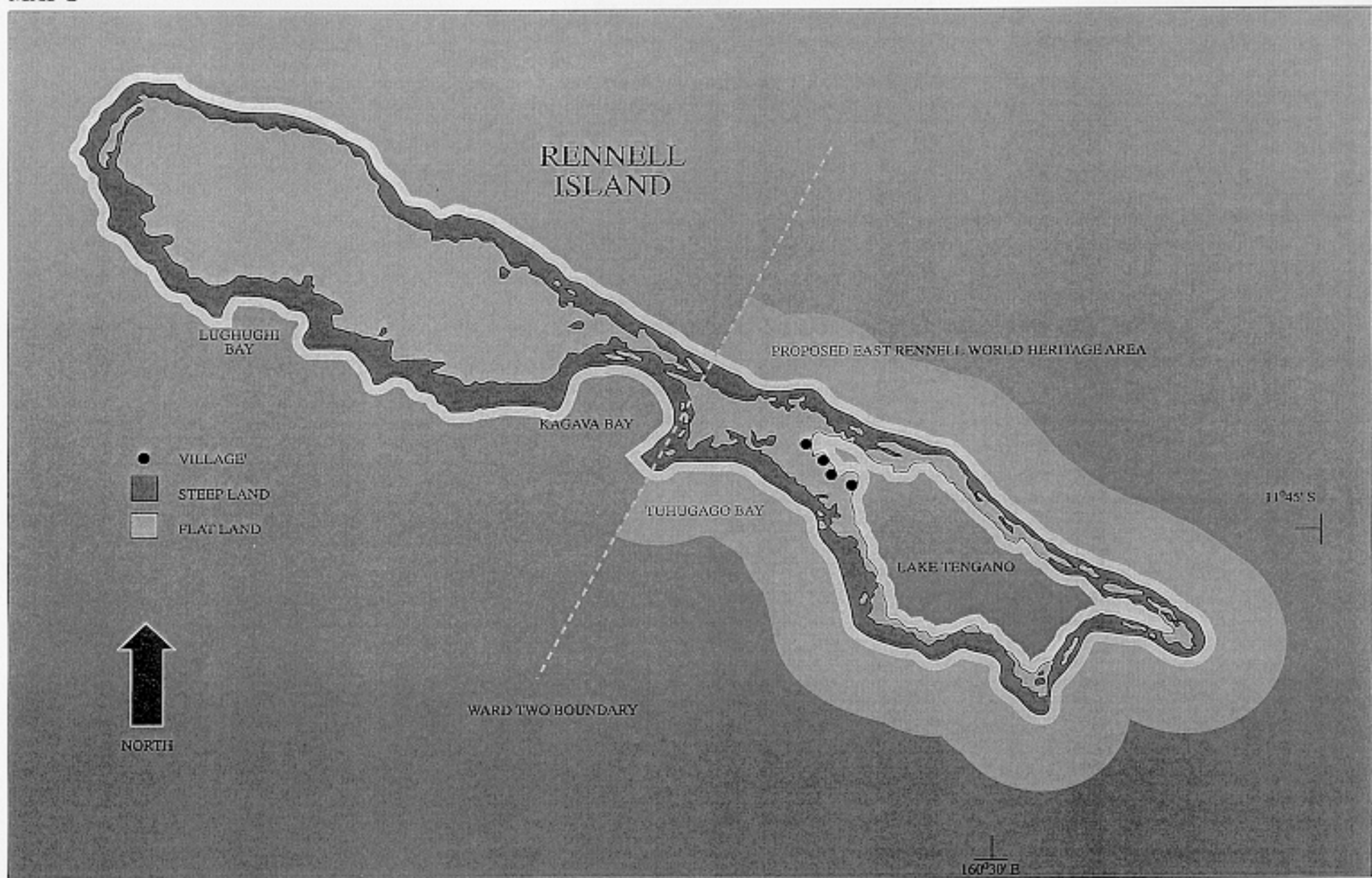
NEW INFORMATION: Subsequent to the Bureau's concurrence with the above conclusions as relayed in a letter from the Centre, the Permanent Secretary of the Ministry of Commerce, Employment and Tourism has responded (September 1) to note that:

- a "Resource Management Objectives and Guidelines" document has been prepared by a New Zealand consultant. This is the first phase in a process that will lead to a management plan that will be prepared by local landowners and institutions over the next three to four years. IUCN considers this document as a strong beginning for a sustainable management regime but there are no indications as to what reaction the local landowners and the MEC have to it.
- The draft World Heritage Protection Bill is not currently being put forward although the Solomon Islands Government is considering a new Environmental Bill. IUCN notes that the rights of customary landowners and customary law is acknowledged in the Constitution of the Solomon Islands but feels that an appropriately worded World Heritage Bill could reinforce those rights while at the same time giving some legal commitment for World Heritage sites at the national level.

## **7. RECOMMENDATION**

The Bureau recognised that the ER nomination breaks new ground in terms of nominating a natural site that is under customary land ownership, that has no formalised legal basis and for which the objective is sustainable resource use. The Solomon Islands authorities have responded to these concerns to note that it will be some time before a plan or national World Heritage legislation is in place.

Considering, however, that the site does meet criterion ii, that there is support among the local landowners for the World Heritage listing, and that the planning process has begun, IUCN recommends that the Committee inscribe the site. At the same time they should reiterate the need for a locally-developed management plan, a national World Heritage Protection Bill, and the suggestion that a mission in three years time to gauge progress be undertaken.



*Rennell Island showing the proposed East Rennell World Heritage Area which includes Lake Tegano, the land and the sea out to three nautical miles.*

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## DÉSIGNATION POUR LE PATRIMOINE MONDIAL - ÉVALUATION TECHNIQUE UICN

### EST DE RENNELL (ÎLES SALOMON)

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#### 1. DOCUMENTATION

- (i) Fiches techniques UICN/WCMC (6 références)
- (ii) Littérature consultée: Collins, N.M. *et. al.* Eds. 1991. **Conservation Atlas of Tropical Forests: Asia and the Pacific** IUCN/WCMC; Solomon Islands National Environmental Management Strategy. 1993. IUCN/SPREP/ADB 160p.; Davis S.D. *et. al.* Eds. 1995. **Centres of Plant Diversity** Vol. II. IUCN/WWF. Wingham, E. 1998. **Resource Management Objectives and Guidelines for East Rennell**. New Zealand ODA, 22p.
- (iii) Consultations: 10 évaluateurs indépendants, fonctionnaires du gouvernement des îles Salomon, représentants de New Zealand Aid, chefs communautaires locaux
- (iv) Visite du site: Jim Thorsell et Les Molloy, février 1998.

#### 2. RÉSUMÉ DES CARACTÉRISTIQUES NATURELLES

Le site désigné, Est de Rennell (ER) se trouve dans le tiers méridional de Rennell, île la plus australe de l'archipel des Salomon. Rennell, qui est le plus grand atoll corallien surélevé du monde, mesure 86 km de long et 15 km de large et couvre 87 500 hectares. La superficie du site désigné est de 37 000 hectares environ, avec un secteur marin s'étendant jusqu'à trois milles nautiques. Le climat est tropical avec des températures élevées uniformes et de l'humidité. Les précipitations annuelles sont de l'ordre de 3 000 à 4 000 mm et la saison sèche dure de mai à août. L'île est relativement fréquemment frappée par des cyclones qui sont le principal facteur de modification.

Rennell est apparue suite à la surélévation de coraux formés sur une crête sous-marine et qui ont subi un processus de dislocation dû à la formation de failles. Le relief, karstique calcaire, est typiquement déchiqueté et érodé et s'élève jusqu'à 200 mètres. Une des caractéristiques principales de l'île est le lac Tegano, ancien lagon de l'atoll et plus grand lac du Pacifique insulaire (15 500 ha). Il est saumâtre et contient de nombreuses îles calcaires accidentées.

Rennell est essentiellement couverte de forêts denses dont la canopée atteint, en moyenne, 20 mètres de hauteur. Les trois principaux types de végétation sont une forêt basse arbustive sur l'arête karstique, une forêt de haute futaie à l'intérieur et une flore de plage le long du lac Tegano. La flore lacustre est dominée par 312 espèces de diatomées et d'algues dont quelques-unes sont endémiques. Il y a 10 plantes endémiques sur l'île et la flore contient à la fois des éléments des îles appauvries du Pacifique, à l'est et de la flore mélanésienne beaucoup plus riche, à l'ouest.

La faune compte 11 espèces de chauves-souris dont une est endémique, 43 espèces d'oiseaux dont quatre sont endémiques. Un serpent de mer endémique vit dans le lac Tegano. La faune d'invertébrés est riche de 27 espèces d'escargots terrestres et de 731 espèces d'insectes. On dispose de peu d'informations sur le milieu marin désigné.

Environ 800 personnes d'origine polynésienne résident dans quatre villages, à l'intérieur du site désigné. L'économie repose sur une agriculture vivrière, la pêche et la chasse. La population locale a besoin de la forêt dont elle tire l'essentiel de ses matériaux de construction. La terre est en propriété coutumière et le lac est considéré comme bien commun.

### **3. COMPARAISON AVEC D'AUTRES AIRES PROTÉGÉES**

Actuellement, 21 îles ou parties d'îles sont inscrites sur la Liste du patrimoine mondial dont quatre dans le Pacifique (Lord Howe, Henderson, les Galápagos et les volcans d'Hawaï). Il y a d'autres îles du patrimoine mondial dans le Parc marin du Récif de la Grande Barrière, à 1000 km à l'est de Rennell. On compte 40 aires protégées dans la province biogéographique de Papouasie, la plupart sur la grande île de Nouvelle-Guinée et sur les îlots qui l'entourent. Dans le contexte plus large de la région, Rennell peut être considérée comme un seuil vers les îles du Pacifique plus éloignées, à l'est, dont la diversité biologique décroît progressivement selon un gradient ouest-est.

Dans l'Évaluation des réseaux d'aires protégées d'Océanie, entreprise en 1987 par A. Dahl pour l'UICN et le PNUE, Rennell figure en huitième place du point de vue de son importance pour la conservation mais en première place dans le groupe des îles Salomon. Elle vient en second après Guam du point de vue de l'importance pour la conservation des atolls coralliens surélevés.

Les caractéristiques distinctives de l'est de Rennell, que l'on ne trouve nulle part ailleurs, sont les suivantes:

- Il s'agit du plus grand atoll corallien surélevé du monde. Dans tout le Pacifique, il y a environ 25 atolls de ce type qui ont tous été fortement modifiés par l'activité anthropique (à l'exception du Bien du patrimoine mondial de l'île Henderson qui couvre un dixième de la superficie de Rennell mais qui est plus intact).
- Le lac Tegano est le plus grand lac du Pacifique insulaire et contient un certain nombre d'espèces endémiques (moins, cependant que les lacs de Palau).
- Les forêts de la zone désignée sont extrêmement peu perturbées par l'homme et présentent un certain nombre d'adaptations aux effets des fréquents cyclones.
- Pour sa taille, l'île Rennell possède un grand nombre d'espèces endémiques, notamment des oiseaux. Avec 29 autres îles du Pacifique, Rennell figure sur la Liste des sites d'oiseaux endémiques établie par BirdLife International (bien qu'elle soit classée en troisième position du point de vue des priorités).
- Dans le Pacifique, la plupart des îles océaniques ont été modifiées par l'activité humaine. Sur Rennell, les impacts sont relativement légers et l'on ne trouve pas de prédateurs envahisseurs tels que les rats et les escargots terrestres exotiques qui ont décimé les faunes d'autres îles.

En conclusion, l'est de Rennell présente un certain nombre de caractéristiques marines, côtières et forestières qui sont mieux représentées ailleurs dans le Pacifique. Le fait, toutefois, qu'elles soient ici rassemblées en un seul lieu et dans un état relativement intact fait que cette île est un endroit particulier pour la province biogéographique de Papouasie.

## 4. INTÉGRITÉ

Trois points sont à examiner du point de vue de l'intégrité: les limites, le régime foncier coutumier et l'appui local à la conservation.

### 4.1 Les limites

Plusieurs évaluateurs se sont demandé pourquoi la désignation ne concernait qu'une partie de l'île. En effet, il serait plus facile de préserver l'intégrité si l'atoll entier était protégé car la forêt de l'est de Rennell n'est pas suffisamment vaste (selon une étude de J. Diamond) pour garantir la survie à long terme des oiseaux endémiques. Il est cependant évident que les projets d'exploitation minière et de coupe des forêts proposés précédemment pour l'ouest de Rennell auraient de graves conséquences pour la conservation, d'autant plus qu'il n'existe pas de plan d'occupation des sols pour l'ensemble de l'île. En outre, les communautés locales de l'ouest de Rennell ne souhaitent pas que leurs terres soient incluses dans la désignation et les caractéristiques principales (en particulier le lac Tegano) se trouvent dans l'est de Rennell. Il est donc impossible actuellement d'envisager une désignation de toute l'île.

### 4.2 Régime foncier coutumier

Comme dans le cas de la plupart des îles du Pacifique et d'autres régions habitées, le territoire de Rennell est au bénéfice d'un régime foncier coutumier traditionnel. Cette situation fait qu'il est difficile (mais pas impossible) que la législation édictée par le gouvernement national soit efficace en matière de gestion. En fait, dans le cas de l'est de Rennell, la capacité du gouvernement central de protéger le site est limitée. Il existe un projet de loi sur la protection du patrimoine mondial mais rien n'a été fait pour réviser ou pour adopter ce projet. Quoi qu'il en soit, la structure de propriété coutumière qui caractérise de nombreuses îles peut être plus bénéfique pour la conservation qu'un contrôle des terres par un gouvernement lointain, à condition naturellement que les pratiques coutumières soient favorables à la protection et que l'autorité des propriétaires coutumiers et l'appui de la communauté ne soient pas érodés.

Les principes opérationnels de la Convention mentionnent que les biens naturels du patrimoine mondial «devraient bénéficier d'une protection législative, réglementaire ou institutionnelle adéquate à long terme» (paragraphe 44.vi). Actuellement, ce principe ne s'applique pas à l'est de Rennell, bien que l'on s'efforce de l'instaurer. Premièrement (mais c'est d'importance secondaire), un intérêt a été exprimé au niveau national pour réviser et envisager d'adopter une loi sur la protection du patrimoine mondial. Cette loi ne serait pas interventionniste mais procurerait un cadre national général pour la protection du patrimoine et renforcerait les objectifs de conservation élaborés par les propriétaires coutumiers.

En outre, les principes opérationnels (parag. 24 (b) (ii)) reconnaissent «les mécanismes traditionnels de protection et de gestion» comme acceptables pour les biens du patrimoine mondial qui répondent aux critères culturels mais ne prévoient rien de semblable pour les sites qui répondent aux critères naturels. La Sixième Conférence du Pacifique sud sur la conservation de la nature (1979) et la réunion du groupe d'experts de la stratégie mondiale, à Amsterdam, en mars 1998 ont recommandé au Comité de reconnaître la protection traditionnelle pour les sites qui satisfont aux critères naturels.

Deuxièmement, et c'est le plus important, un processus vient d'être engagé par le Comité local de gestion et de conservation pour préparer un plan de gestion des ressources pour l'est de Rennell. L'avis de l'UICN à ce sujet et concernant des situations semblables est qu'il importe de disposer d'un document officiel (tel que celui



que pourrait soumettre officiellement le Comité de gestion et de conservation, en tant que représentant des résidents locaux) qui fournisse les grandes lignes des objectifs de gestion et des mesures de protection du site. Il n'est pas possible de dire si les pratiques coutumières assureront cette protection tant que l'on ne dispose pas de ce document.

#### 4.3 Appui local à la conservation

Durant la mission sur le terrain, l'UICN a été impressionnée par les déclarations faites par les chefs locaux et par le chef suprême quant à leur désir d'instaurer le développement durable de l'est de Rennell. L'initiative du patrimoine mondial est très étroitement liée au vœu de la population de Rennell d'encourager l'écotourisme dans la région. Pour cela, il y a fort à faire en matière d'éducation, de formation et d'instauration d'un processus décisionnel participatif. La préparation du plan de gestion des ressources sous l'égide du Comité pour la gestion et la conservation devrait renforcer cette sensibilisation locale et préparer cette activité économique.

### **5. AUTRES COMMENTAIRES**

Pour l'essentiel, les efforts de promotion de la conservation dans l'est de Rennell ont été déployés avec l'appui du Programme d'aide au développement du gouvernement de la Nouvelle-Zélande. Un projet semblable, pour le lagon de Marovo, pourrait aussi conduire à la désignation d'un bien naturel et le gouvernement de la Nouvelle-Zélande devrait être félicité pour l'aide qu'il apporte à la conservation des écosystèmes insulaires dans le Pacifique.

Un évaluateur a émis l'hypothèse qu'il serait peut-être bon d'envisager d'évaluer les caractéristiques de paysage culturel du site, en raison de l'interaction historique entre les propriétaires coutumiers et l'île de Rennell.

En ce qui concerne le milieu marin inclus dans la désignation, il existe peu d'informations et d'autres travaux de recherche sont nécessaires sur cet aspect du site désigné.

### **6. CHAMP D'APPLICATION DES CRITÈRES NATURELS DU PATRIMOINE MONDIAL**

Comme nous en avons discuté dans le paragraphe consacré à la comparaison avec d'autres aires protégées, l'est de Rennell ne se distingue pas particulièrement pour ses paysages extraordinaires, sa diversité biologique ou sa géologie et l'UICN considère que les critères i, iii et iv ne sont pas étayés de manière convaincante dans la désignation. Le principal point fort de la désignation repose sur le critère ii qui traite des processus écologiques et biologiques importants en cours, évidents dans l'île. L'est de Rennell est un site important pour la recherche scientifique sur la biogéographie insulaire comme en témoignent les importantes études menées par l'université de Copenhague, entre autres. On étudie les processus en rapport avec le rôle de l'est de Rennell en tant que seuil de migration et d'évolution des espèces dans le Pacifique occidental et avec la spéciation en cours, en particulier en ce qui concerne l'avifaune. Avec les effets climatiques marqués de cyclones fréquents, l'est de Rennell est un véritable laboratoire naturel pour la science.

Il est donc considéré que le site satisfait au critère ii mais les conditions d'intégrité spécifiées dans les Principes opérationnels ne sont pas satisfaites. Bien que la propriété coutumière n'empêche pas d'examiner l'inscription du site, l'UICN estime qu'une condition essentielle serait de disposer d'une déclaration officielle sur les objectifs et les mesures de gestion. Ce point est tout particulièrement requis en l'absence de tout cadre juridique national qui permettrait de renforcer les objectifs de conservation des propriétaires coutumiers (mais il serait préférable de disposer d'un tel cadre). Au-delà de la préparation du document de gestion des ressources locales et de l'adoption d'une loi nationale, il reste à organiser la formation, l'éducation, le jalonnement du site et autres activités de gestion de base.

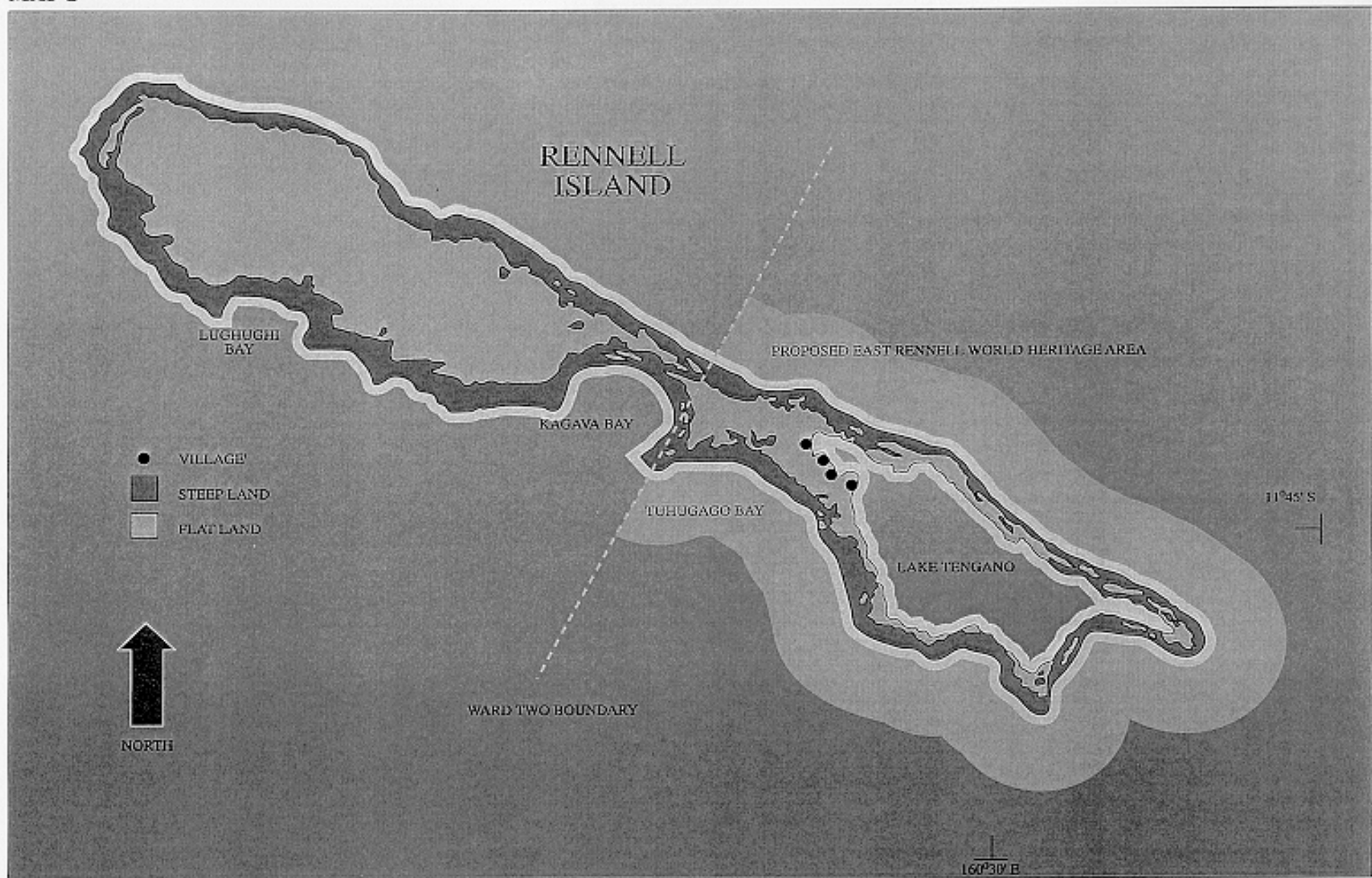
NOUVELLE INFORMATION: Suite à la lettre du Centre dans laquelle il était fait état que le Bureau faisait siennes les conclusions transcrites ci-dessus, le Secrétaire permanent du ministère du Commerce, de l'Emploi et du Tourisme a répondu (1er septembre) dans ces termes:

- un document intitulé «Resources management Objectives and Guidelines» a été rédigé par un consultant néo-zélandais. Il s'agit de la première étape d'un processus qui conduira à la préparation d'un plan de gestion par les propriétaires locaux et les institutions locales, durant les trois à quatre prochaines années. L'UICN considère que ce document est un bon point de départ pour un régime de gestion durable mais ignore quelles sont les réactions des propriétaires locaux et du MEC à ce sujet.
- Le projet de loi sur la protection des biens du patrimoine mondial n'est pas à l'étude mais le gouvernement des îles Salomon envisage un nouveau projet de loi sur l'environnement. L'UICN fait remarquer que les droits des propriétaires coutumiers et le droit coutumier sont reconnus dans la Constitution des îles Salomon mais estime qu'un projet de loi sur le patrimoine mondial, correctement rédigé pourrait renforcer ces droits et apporter une forme d'engagement juridique envers les biens du patrimoine mondial au niveau national.

## **7. RECOMMANDATION**

Le Bureau reconnaît que la candidature de l'est de Rennell est un précédent car il s'agit d'un site naturel sous régime foncier coutumier n'ayant pas de fondement juridique officiel et dont l'objectif est l'utilisation durable des ressources. Les autorités des îles Salomon ont répondu à cette préoccupation en indiquant qu'il faudra du temps pour qu'un plan ou une loi sur le patrimoine mondial entrent en vigueur.

Considérant, cependant, que le site répond au critère ii, que les propriétaires locaux apportent leur soutien à cette candidature et que le processus de planification a commencé, l'UICN recommande au Comité d'inscrire le site. Il serait bon que le Comité réitère la nécessité d'élaborer localement un plan de gestion et de préparer une loi sur le patrimoine mondial et propose d'organiser, dans trois ans, une mission chargée d'évaluer les progrès accomplis.



*Rennell Island showing the proposed East Rennell World Heritage Area which includes Lake Tegano, the land and the sea out to three nautical miles.*