



**THIRD SOUTH PACIFIC NATIONAL
PARKS & RESERVES CONFERENCE**

CONFERENCE REPORT — VOLUME 3

COUNTRY REVIEWS

© Copyright South Pacific Commission, 1985.

All rights reserved. No part of this publication may be reproduced in any form or by any process, whether for sale, profit, material gain, or free distribution without written permission. Inquiries should be directed to the publisher.

Original text: English.

Prepared for publication at
South Pacific Commission headquarters, Noumea, New Caledonia
and printed at

Universal Print, 18-20 Lorne Street, Wellington, New Zealand.

"Reprinted July 1987"

REPORT
OF THE THIRD
SOUTH PACIFIC NATIONAL PARKS AND RESERVES CONFERENCE

HELD IN
APIA, WESTERN SAMOA, 1985

VOLUME III
COUNTRY REVIEWS

FOREWORD

The Third South Pacific National Parks and Reserves Conference was held in Apia, Western Samoa, 24 - 3 July 1985 and as its title implies it was the third in a series of regular meetings of Pacific countries on the issues of protected areas and conservation. The earlier conferences were held in New Zealand and Australia in 1975 and 1979 respectively.

The principal objective of the Conference was to promote the conservation of nature in the South Pacific Region by raising awareness of its importance and by encouraging governments to protect and manage both their terrestrial and marine ecosystems. The theme of traditional conservation knowledge and practices was central to the Conference. Other themes covered included legal, administrative and regional issues; marine and coastal issues; training and tourism and resource and park management.

The Conference was organised by the South Pacific Regional Environment Programme (SPREP) of the South Pacific Commission (SPC) in conjunction with the Government of Western Samoa, and the International Union for the Conservation of Nature and Natural Resources (IUCN).

The Conference comprised two main sessions:

- (i) A six day Technical Session at which Country Review, Key Issue and Case Study papers were presented, a draft Action Strategy for Protected Areas in the Pacific Region prepared and resolutions formulated for review and adoption by the subsequent Ministerial Session.
- (ii) A three day Ministerial Session at which resolutions and the draft Action Strategy were considered and adopted, the Convention on Nature Conservation for the South Pacific discussed, and commitments by countries to protected areas and nature conservation were made.

A one week training course in protected area management followed the Conference.

Papers for the Conference fell into three main categories: Key Issue papers, Case Studies and Country Reviews. Key Issue papers generally introduced a Conference theme and covered subjects of regional relevance, i.e. of relevance to all countries, while Case Studies documented a specific issue or approach to an issue under a Conference theme. Country Reviews recorded the current state of protected area management in each of the participating countries.

The range of topics covered at the Conference was wide and reflected the very diverse backgrounds of the Conference participants. Although the papers highlighted the many difficulties facing those responsible for protected area management and resource conservation in the region, there was also heartening evidence that despite these difficulties, significant progress is being made by many countries in these areas. There was also evidence of a growing awareness throughout the region of the need for environmental protection and conservation measures if the island countries are to achieve a sustainable standard of living. In this respect strong emphasis was placed on the important role of conservation education and training.

This report is Volume III of four volumes which comprise the full Conference report. It contains all sixteen of the Country Review papers which were presented at the Conference. In most cases these conform to a set format consisting of two parts. Part I is a General Report introducing

the country, its geography and its legal and administrative system as these relate to conservation and protected area management. Also included are comprehensive lists of protected, and proposed protected areas together with comments on the problems, needs and prospects facing protected area management and conservation. Part II consists of Information Sheets on Protected Areas which provide specific data on the tenure and status of each area, its physical and biological features, related reference material and management and research provisions.

This volume, and volume 2 containing the collected key issue and case study papers therefore represent the first comprehensive publications on protected areas and related issues in the South Pacific region. As such they are valuable source reference material and a basis on which to gauge progress in the fields of protected area management and resource conservation in the four years before the fourth Conference in 1989.

The Volumes comprising the full Conference Report are:

- Volume 1. Summary Record of Conference Proceedings
- Volume 2. Collected Reviews, Key Issue and Case Study Papers
- Volume 3. Country Reviews
- Volume 4. Report on Conference Arrangements.

Additional publications arising from the Conference are the Action Strategy for Protected Areas in the South Pacific Region and a Training Manual for Protected Area Management in the South Pacific.

All publications are available from the:

South Pacific Regional Environment Programme (SPREP)
South Pacific Commission
B.P. D5
Noumea
New Caledonia.

Volumes 2 and 3 have been edited by Mr P.E.J. Thomas for the South Pacific Regional Environment Programme.

Noumea
February 1986.

LIST OF COUNTRIES

	<u>Pages</u>
1. AUSTRALIA	1 - 59
2. COOK ISLANDS	60 - 75
3. FIJI	76 - 92
4. GUAM (Territory of)	93 - 114
5. KIRIBATI (Republic of)	115 - 124
6. NEW CALEDONIA	125 - 133
7. NEW ZEALAND	134 - 158
8. NORTHERN MARIANA ISLANDS (Commonwealth of the)	159 - 161
9. PALAU	162 - 174
10. PAPUA NEW GUINEA	175 - 194
11. SOLOMON ISLANDS	195 - 209
12. TOKELAU	210
13. TONGA (Kingdom of)	211 - 216
14. VANUATU	217 - 228
15. WALLIS AND FUTUNA	229 - 231
16. WESTERN SAMOA	232 - 269

AUSTRALIA

This Review is in two parts. The first part, the general review, includes information which is readily available (published) along with additional information forwarded by the various State/Territory Governments specifically for inclusion in this report. The second part, information sheets on protected areas, includes examples of nature conservation reserves from each State and Territory. In the long term it is hoped that the different State/Territory governments will continue to compile information on their protected areas.

PART I - GENERAL REPORT

The first six points of this report; Introduction, Policy, Law, Parks and Reserves Administration, Addresses, and List of Protected Areas are covered by the appended information from the Australian National Parks and Wildlife Service (ANPWS) Occasional Paper No. 10 Nature Conservation Reserves in Australia (1984), [Wilson, J.L. (ed), 1984]. Additional information has been listed under the various points.

Australia is a large island continent covering almost 770 million hectares. Of this area nearly 4% or nearly 30 million hectares is reserved for nature conservation as of 30 June 1984. The population of Australia is approximately 15.5 million people, most of whom are situated in the south-east part of the country.

Australia has a federal system of government and, as well as the Commonwealth Government, there are six State and two Territorial Governments (excluding external territories). The Australian Constitution gives primary responsibility for land management to the States and Territories and so the majority of our national parks and other reserves have been proclaimed under State or Territory legislation. There exist between the States differences in Government responsibilities for public land management. Each government has its own agency or agencies which are responsible for nature conservation and nomenclature and management practices vary from State to State. Development of common policies occurs mainly through meetings of the Council of Nature Conservation Ministers (CONCOM), its Standing Committee and Working Groups.

INTRODUCTION

Refer to Appendix 1 pp 9 - 12.

Additional information on Australia's Population (000's at June 1984*) is as follows:

STATE TERRITORY

Australian Capital Territory	A.C.T.	245.6
New South Wales	N.S.W.	5,405.1
Northern Territory	N.T.	138.9
Queensland	Qld	2,505.1
South Australia	S.A.	1,353.0
Tasmania	Tas	437.3
Victoria	Vic	4,075.9
Western Australia	W.A.	<u>1,382.6</u>
Total Australia		<u>15,543.6</u>

* Australian Bureau of Statistics

POLICY

Refer to Appendix 1 pp 13 - 23.

LAW

A. EXISTING LEGISLATION

Refer to Appendix 1 pp 13 - 23.

B. TRADITIONAL CUSTOMS AND PRACTICES

Documentation of Australian Aboriginal traditions of relevance to conservation is still in its infancy, although some traditional practices are being pursued by some State/Territory and Commonwealth agencies.

The Australian environment is extremely diverse, with a continuum from tropical rainforest to alpine and arid biomes across the continent. Culturally there were originally some 500 tribal groups inhabiting the mainland and Tasmania (Tindale 1974). Unfortunately many of the traditional practices of relevance to conservation have been lost due to attrition of Aboriginal cultures in all but the remotest areas.

It is almost impossible to concisely document traditional practices relevant to conservation in Australia, because such relationships with the environment tend to operate at the ecosystem level.

Nevertheless, several developments in the incorporation of traditional knowledge, expertise and authority in conservation management are worth nothing:

- (i) Researchers have generalised that the traditional use of fire as an extensive range management tool has heavily influenced the majority of Australian plant communities. But the extent to which all ecosystems owe their development and maintenance to traditional practices is largely unknown. Intact fire management traditions are being incorporated into the fire management plans of at least one major national park (Kakadu National Park, Northern Territory) and are being investigated in others.
- (ii) Documentation of tribal knowledge of the ecology of rare, endangered and extinct species has provided encouraging results and is being pursued by several State/Territory and Commonwealth agencies. Attempts are being made to incorporate this material in interpretive programmes and to encourage the acquisition of further material by Aboriginal rangers as post-training project work.
- (iii) Some land-owning Aboriginal groups have advised that they wish to manage some of their land for conservation purposes, particularly in relation to the conservation of plant and animal species, the maintenance of habitat including breeding areas, and the sustained yield of timber resources under environmentally sound management practices. In some cases there is an aspiration for income derived from low key tourism.

PARKS AND RESERVES ADMINISTRATION

Refer to Appendix 1 pp. 13 - 23.

ADDRESSES

Refer to Appendix 1 pp. 7 - 8.

LIST OF PROTECTED AREAS

Refer to Map I. An extensive list of protected areas in Australia is available in Nature Conservation Reserves in Australia (1984) ANPWS Occasional Paper No. 10 [Wilson, J.L. (ed.) 1984].

The Committee for National Parks and Protected Areas (CNPPA) of the International Union for the Conservation of Nature and Natural Resources (IUCN) system of nomenclature has not yet been universally accepted in Australia. Four agencies have thus far endeavoured to categorise their reserves by this system. They are the New South Wales and South Australian (S.A.) National Parks and Wildlife Services and the Victorian National Parks Service and the Conservation Commission of the Northern Territory. New South Wales, South Australia and the Northern Territory have applied the system to all of their areas. Victoria has classified only those areas larger than 1000ha. The CNPPA system is not being used by Victoria but its adoption is under consideration for a range of reserves. In these applications of the CNPPA system, the statutory name (e.g. national park, nature reserve, etc) has been retained (See Appendices 2, 3 and 4).

In seeking to apply the CNPPA system these agencies have noted that the Australian parks and reserves system does not lie easily within the categories and nomenclature as established by IUCN and has some shortcomings.

The CNPPA system was established before the acceptance of the World Conservation Strategy and may now need to be modified to reflect the principles of that document.

Australia has a number of areas which have been formally declared as UNESCO Biosphere Reserves and World Heritage Properties. Most are based on parks or reserves previously gazetted as national parks, nature reserves etc. These are listed in Appendix 5, and are illustrated in maps 2 and 3 respectively.

LIST OF PROPOSED PROTECTED AREAS

A number of areas are being considered for reservation including two proposals submitted by the New South Wales Government to the Australian National Commission for UNESCO for consideration as MAB (Man and the Biosphere Programme) Biosphere Reserves.

PROBLEMS, NEEDS AND PROSPECTS

In the Australian federal system, progress towards improved policies and management practices is largely pursued through a Ministerial Council of Nature Conservation Ministers (CONCOM), representing the Federal, State and Territory governments. Observers to these meetings also include representatives from New Zealand and Papua New Guinea. The Council is supported by a Standing Committee of the heads of the national park agencies, which in turn relies on Working Groups of officers to examine important issues and develop reports, discussion papers and recommendations.

Parks and reserves issues currently receiving consideration include a review of existing wilderness areas and policies for their management and establishment, evaluation of the CNPPA system of nomenclature, reviewing procedures for development of management plans in protected areas, and an evaluation of UNESCO Biosphere Reserves in Australia, and consideration of guidelines for concession management in protected areas.

A big expansion in protected areas over the past ten years has coincided with more difficult economic conditions, so that a current problem for most agencies is shortage of staff. On the other hand considerable progress is being made in staff training and development, use of computer and other technology in management planning, and public participation in the declaration of reserves, the development and review of management plans and consideration of management issues. Aboriginal involvement in park management is an exciting new field of activity.

Major needs are generally seen as being in the areas of education and public understanding, the collection and collation of resource inventory data, and the provision of sufficient trained staff to interface adequately with the public. Public understanding to some extent is limited because of anomalies in nomenclature, but this aspect is gradually being recognised by agencies, as current activities of the CONCOM Working Group on Management of National Parks show.

PRINCIPAL REFERENCES AND MAPS

AUSTRALIA'S WORLD HERITAGE PROPERTIES

- Australian Heritage Commission (1980). *Nomination of the Willandra Lakes Region for Inclusion in the World Heritage List*. Australian Heritage Commission.
- Australian National Parks and Wildlife Service (1980). *Nomination of Kakadu National Park for Inclusion in the World Heritage List*. Australian National Parks and Wildlife Service.
- Great Barrier Reef Marine Park Authority (1981). *Nomination of The Great Barrier Reef by the Commonwealth of Australia, for Inclusion in the World Heritage List*. Townsville: G.B.R.M.P.A.
- New South Wales Government, Australian National Parks and Wildlife Service and Australian Heritage Commission (1981). *Nomination of The Lord Howe Island Group by the Commonwealth of Australia, for Inclusion in the World Heritage List*. Australian Heritage Commission.
- Tasmanian Government, Australian Heritage Commission (1981). *Nomination of Western Tasmania Wilderness National Parks by the Commonwealth of Australia, for inclusion in the World Heritage List*. Australian Heritage Commission.

AUSTRALIA'S BIOSPHERE RESERVES

- Davis, B.W. and Drake, G.A., (1983). *Australia's Biosphere Reserves: Conserving Ecological Diversity*.

GENERAL

- Bardwell, S. (1985). *National Parks of Victoria*. Gregory's, Sydney.
- Fairley, A. (1982). *A Field Guide to the National Parks of Victoria*. Rigby, Adelaide.
- Morcombe, M. (1971). *Australia's National Parks*. Lansdowne Press, Melbourne.
- Reader's Digest (1984). *Wild Australia, a Recreational Guide to all our National Parks*. Reader's Digest, Sydney.

Tindale, N.B. (1974). *Aboriginal Tribes of Australia*. University of California Press.

Wilson, J.L. (ed) (1984). *Nature Conservation Reserves in Australia (1984)*. *Australian National Parks and Wildlife Service Occasional Publication No. 10*.

MAPS

Map 1 : Australia: Nature Conservation Reserves (1984), 1:20 million scale, Division of National Mapping, Department of Resources and Energy (NMP/84/1562), Canberra.

Map 2 : Location of Biosphere Reserves: redrawn from Map 2 in Davis and Drake (1983), *Australia's Biosphere Reserves*.

Map 3 : Location of Australia's World Heritage Properties: compiled from publications listed under same titles.

PART 2 - INFORMATION SHEETS ON PROTECTED AREAS

Because of the large number of national parks and reserves in Australia it has not been possible to prepare a comprehensive listing at this time. Examples from each State/Territory agency have been included in this report (see Appendix 6). Australia already has 33 Protected Areas described in the *World Directory of National Parks and Other Protected Areas* compiled in 1975. The information sheets included in this report are largely an update of those already listed and describe the following areas:

Namadji National Park	- Australian Capital Territory
Tidbinbilla Nature Reserve	- Australian Capital Territory
Guy Fawkes River National Park	- New South Wales
Kanangra-Boyd National Park	- New South Wales
Cobourg Peninsula National Park	- Northern Territory
Innes National Park	- South Australia
Simpson Desert Conservation Park	- South Australia/Queensland/Northern Territory
Southwest National Park	- Tasmania
Cradle Mountain-Lake St Clair National Park	- Tasmania
Yalgorup National Park	- Western Australia
Hammersley Range National Park	- Western Australia
Epping Forest National Park	- Queensland
Raine Island Fauna Refuge	- Queensland

APPENDIX 1

The information in this Appendix is reproduced from Occasional Paper No. 10 Nature Conservation Reserves in Australia (1984) edited by J.L. Wilson (1985) and published by The Australian National Parks and Wildlife Service, Canberra, ACT, Australia.

SUMMARY — ADDRESSES OF NATURE CONSERVATION AUTHORITIES

Australian Capital Territory

ACT Parks and Conservation Service
 Department of Territories
 GPO Box 158
 CANBERRA ACT 2601
 Phone (062) 46 2308

External Territories and National

Australian National Parks and Wildlife Service	Construction House
GPO Box 636	217 Northbourne Avenue
CANBERRA ACT 2601	TURNER ACT
Phone (062) 46 6211	

New South Wales

National Parks and Wildlife Service	
PO Box N189	189-193 Kent Street
Grosvenor Street Post Office	SYDNEY NSW
SYDNEY NSW 2000	
Phone (02) 237 6500	

Northern Territory

Conservation Commission of the Northern Territory	
PO Box 1046	Gap Road
ALICE SPRINGS NT 5750	ALICE SPRINGS NT
Phone (089) 50 8211	

Queensland

National Parks and Wildlife Service	
PO Box 190	MLC Centre
NORTH QUAY QLD 4000	239 George Street
Phone (07) 224 0414	BRISBANE QLD

South Australia

National Parks and Wildlife Service	
PO Box 667	55 Grenfell Street
ADELAIDE SA 5001	ADFLAIDE SA
Phone (08) 216 7777	

Tasmania

National Parks and Wildlife Service	
PO Box 210	Magnet Court
SANDY BAY TAS 7005	SANDY BAY TAS
Phone (002) 30 8033	

Victoria

National Parks Service
 Department of Conservation, Forests and Lands
 240 Victoria Parade
 EAST MELBOURNE VIC 3002
 Phone (03) 651 4011

Fisheries and Wildlife Service
 Department of Conservation, Forests and Lands
 250 Victoria Parade
 EAST MELBOURNE VIC 3002
 Phone (03) 651 4011

Western Australia

National Parks Authority of Western Australia
Department of Conservation and Land Management
Hackett Drive
NEDLANDS WA 6009
Phone (09) 386 8811

Western Australian Wildlife Authority
Department of Conservation and Land Management
108 Adelaide Terrace
PERTH WA 6000
Phone (09) 325 5988

INTRODUCTION

The aim of this publication is to provide information on nature conservation reserves in Australia and the external territories declared up to June 30 1984.

The publication is divided into two main sections — administration and list of reserved areas. Within each section there is a further division into States and Territories (alphabetical order). Explanation of administration and legislation, definitions of designations, addresses and telephone numbers are included in the administration section. The names and areas of reserves are arranged alphabetically in the list of reserves section. If the area is .01 hectares or less it is noted as small and no figure included on the list. A summary of addresses of State and Territory nature conservation authorities is also included in this publication. For information on the location of many nature conservation reserves refer to the National Mapping publication, 'Nature Conservation Reserves', 3rd edition, 1:5,000,000 map series.

Areas included in the List of Reserves

Areas were selected for inclusion in the list of reserves on the following criteria:

- predominantly terrestrial areas, shoreward from low water mark
- managed by State, Territory or Commonwealth nature conservation authorities (summarised on page 1)
- managed for nature conservation, including some areas such as historical reserves and recreation areas, where nature conservation management is important but not the primary aim.

These protected areas may be classified as nature conservation reserves

Designation	No declared
Aboriginal areas	8
Aboriginal sites	4
Aboriginal national parks	1
Conservation areas	31
Conservation parks	175
Conservation reserves	12
Environmental parks	106
Fauna refuges	2
Fauna reserves	3
Game reserves	17
Historic Sites	40
Historical reserves	11
Mutton bird reserves	5
National nature reserves	3
National parks	322
Nature parks	21
Nature reserves	1,248
Other parks and reserves	
Historic parks	2
State parks	15
Coastal parks	3
Parks	6
Other areas	4
Recreation Parks	15
Reserves	9
Scientific purpose reserves	2
State game reserves	67
State nature reserves	89
State parks	1
State recreation areas	18
State reserves	53

The definition for each of these designations can be found in the relevant State or Territory administration sections (pages 7–17).

Marine and Estuarine Protected Areas (MEPA)

The Australian National Parks and Wildlife Service also produce an inventory of marine and estuarine protected areas (Special Publication No 12). Reserves in the inventory include nature conservation areas that are estuarine or seaward of high water mark. There is some overlap between the MEPA publication and this publication. In some cases intertidal areas and estuarine areas are included in this publication. Nature conservation reserves in this list of reserves which are partly included in the MEPA inventory are asterisked.

NATURE CONSERVATION RESERVES IN AUSTRALIA (1984)

AREA OF NATURE CONSERVATION RESERVES

The area of Australia excluding external territories is 768,242,785 hectares, of which 30,324,718 hectares or 3.95% of land area is reserved for nature conservation as of 30 June 1984. The distribution of such areas within the States and Territories is as follows. Also included in this list are the land reserves of the external territories.

	AREA (HECTARES)
AUSTRALIAN CAPITAL TERRITORY	240,000
Nature reserves	71,985
Reserves	521
Total	72,506
Land reserved for nature conservation	30.21%
EXTERNAL TERRITORIES	
National parks	2,060
National nature reserves	327
Total	2,387
NEW SOUTH WALES	80,160,000
National parks	2,833,250
Nature reserves	490,974
State recreation areas	19,483
Aboriginal areas	86
Historic sites	2,872
Total	3,346,665
Land reserved for nature conservation	4.17%
NORTHERN TERRITORY	134,620,000
National parks	288,013
Aboriginal national parks	191,659
Australian government national parks	1,439,931
Conservation reserves	7,925
Nature parks	24,139
Game reserves	1,589
Historical reserves	5,837
Total	1,959,093
Land reserved for nature conservation	1.46%
QUEENSLAND * See page 12. for amended list	172,720,000
National parks	4,014,381
Environmental parks	42,901
Fauna reserves	30,227
Fauna refuges	5,450
Scientific purpose reserves	27,300
Total	4,120,259
Land reserved for nature conservation	2.39%

	AREA (HECTARES)
SOUTH AUSTRALIA	98,400,000
National parks	599,964
Conservation parks	3,907,587
Recreation parks	2,760
Game reserves	<u>18,962</u>
Total	4,529,273
Land reserved for nature conservation	4.6%
TASMANIA	6,792,785
National parks	851,051
State reserves	18,514
Nature reserves	29,426
Game reserves	2,770
Conservation areas	33,000
Muttonbird reserves	9,288
Aboriginal sites	1,243
Historic sites	<u>723</u>
Total	946,015
Land reserved for nature conservation	13.93%
VICTORIA	22,760,000
National parks	853,421
Other parks	299,422
State game reserves (SGR)	38,979
State nature reserves (SNR)	70,709
Awaiting classification as SGR or SNR	7,864
State parks	<u>8,149</u>
Total	1,278,544
Land reserved for nature conservation	5.62%
WESTERN AUSTRALIA	252,550,000
National parks	4,425,717
Reserves	1,087
Nature reserves	<u>9,645,559</u>
Total	14,072,363
Land reserved for nature conservation	5.57%

* Queensland Amended List as at 24 April 1985.
Lists of protected areas (with sizes):

National Parks as at 24/04/85.
 313 parks - 3,346,392.5 hectares.

Fauna Reserves as at 24/04/85.
 3 reserves - 30,227.894 hectares.

Environmental Parks as at 24/04/85.
 124 parks - 43,074.0048 hectares.

Departmental and Official Purposes Reserves as at 24/04/85.
 18 reserves - 20,857.23 hectares.

Fauna Refuges as at 24/04/85
 3 refuges - 5,478.805 hectares.

Scientific Purposes Reserves as at 24/04/85.
 2 reserves - 32,645.695 hectares.

TOTAL AREA OF 3,478,676.1288 HECTARES

ADMINISTRATION OF NATURE CONSERVATION RESERVES

Responsibility for nature conservation reserves rests mainly with the States and Territories. The Council of Nature Conservation Ministers (CONCOM) provides a forum whereby it co-ordinates nature conservation activities. The Council meets once a year and is supported by a standing committee comprising the Directors of all Australian nature conservation authorities and a representative of the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

AUSTRALIAN CAPITAL TERRITORY

Legislation

The Nature Conservation Ordinance, 1980 provides for the protection and conservation of wildlife and for the reservation of areas for those purposes. The Minister may, by notice in the Commonwealth of Australia Gazette, declare an area in the Australian Capital Territory and Jervis Bay Territory to be a reserve. Similar provisions under the Public Parks Ordinance, 1928-66 provide for the declaration of public parks and recreation reserves, some of which are managed as nature reserves.

Administration

Nature reserves in the Australian Capital Territory and Jervis Bay Territory are administered and managed by the ACT Parks and Conservation Service of the Department of Territories. These reserves include outstanding natural areas and some significant hills and rural parts of the National Capital Open Space System.

Overall management objectives are.

- to maintain natural ecosystems and landscapes and to protect sites of pre-historic and historic significance for present and future generations of Australians
- to provide opportunities for recreational, scientific and educational use and enjoyment of these resources consistent with their protection.

The Minister may make regulations to protect reserves, govern their use and the conduct of the public in them, define the powers of rangers and impose penalties.

Designations

Nature reserve: land set aside primarily for conservation and also for compatible recreational use.

Reserve: land set aside for both conservation and compatible recreational use.

Address

ACT Parks and Conservation Service
 Department of Territories
 GPO Box 158
 CANBERRA ACT 2601
 Phone (062) 46 2308

EXTERNAL TERRITORIES

Legislation

The National Parks and Wildlife Conservation Act, 1975 provides for the establishment of parks or reserves over land or sea areas where there is constitutionally a basis for Commonwealth action. These areas may be designated as national parks or some other designation and may only be revoked by a resolution of both Houses of Federal Parliament. Plans of management are required to be prepared and, after being subject to public comment and amendment, are considered by the responsible Minister and laid before both Houses of Federal Parliament.

Under the Norfolk Island National Park and Norfolk Island Botanic Garden Act, 1984, Norfolk Island National Park has been proclaimed.

Administration

The Director of the Australian National Parks and Wildlife Service is responsible for the areas proclaimed under the National Parks and Wildlife Conservation Act, 1975. Areas proclaimed under this Act in the External Territories include Christmas Island National Park, Coringa-Herald National Nature Reserve (885,600 ha), Lihou Reef National Nature Reserve (843,600 ha) and Ashmore Reef National Nature Reserve (58,300 ha). The latter three are predominantly marine areas.

Since proclamation of Norfolk Island National Park the Norfolk Island Government has approached the Australian Government requesting the Australian National Parks and Wildlife Service to manage the national park.

Designations

National parks: relatively large areas which contain representative samples of major natural regions, features or scenery of national or international significance where plant and animal species, geomorphological sites, and habitats are of special scientific, education, and recreational interest.

National nature reserves: nationally significant areas set aside primarily for nature conservation.

Addresses

Australian National Parks and Wildlife Service,

GPO Box 636
CANBERRA ACT 2601
Phone (062) 46 6211

Construction House
217 Northbourne Ave
TURNER ACT

NEW SOUTH WALES

Legislation

The National Parks and Wildlife Act, 1974 provides for national parks and nature reserves to be created by proclamation. Plans of management are prepared with regard to the objectives of conservation, study and appreciation of wildlife and natural features and to promote appreciation and enjoyment of the natural values of these areas. They are subject to public comment before adoption by the Minister for Environment and Planning.

The Act establishes a National Parks and Wildlife Advisory Council to advise the Minister on the control and management of national parks and nature reserves. Advisory committees may also be established for each national park to make recommendations to the above Council, the Director or Superintendent of the respective national park. The Act also establishes specialist advisory committees to advise the Minister and the Director on Aboriginal relics.

Administration

National parks, nature reserves, state recreation areas, Historic Sites and Aboriginal areas are managed by the National Parks and Wildlife Service established under the Act and responsible to the Minister for Environment and Planning.

Designations

National parks: relatively large areas set aside for their features of predominantly unspoiled natural landscape, flora and fauna, permanently dedicated for public enjoyment, education and inspiration, and protected from all interference other than essential management practices, so that their natural attributes are preserved.

Nature reserves: areas of special scientific interest containing wildlife or natural phenomena where management practices aim at maximising the value of the area for scientific investigation and education purposes.

State recreation areas: permanent reservations in the form of large regional parks established to provide recreational opportunities in an outdoor environment.

Historic sites: areas preserved as the sites of buildings, objects, monuments or landscapes of national importance.

Aboriginal areas: places of significance to Aborigines or sites containing relics of Aboriginal culture.

Addresses

National Parks and Wildlife Service
PO Box N189
Grosvenor Street Post Office
SYDNEY NSW 2000
Phone (02) 237 6500

189-193 Kent Street
SYDNEY NSW

NORTHERN TERRITORY

Legislation

The Conservation Commission Act, 1980 established the Conservation Commission of the Northern Territory to promote the conservation and protection of the natural environment and establish and manage parks, reserves and sanctuaries and undertake other functions relating to soil and environmental conservation. The Commission is a corporation of eight members, two of whom are the Director of Conservation and his Deputy and another two members nominated by the Aboriginal Land Councils. Land is reserved under the provisions of the Territory Parks and Wildlife Conservation Act by the Administrator of the Northern Territory following receipt of a report from the Conservation Commission. This Act refers only to the creation of 'parks and reserves', allowing considerable flexibility in the interpretation of these terms. Accordingly, areas declared may range from small sites of specific interest to major national parks. All land is held by the Conservation Land Corporation as constituted under the Conservation Commission Act. Revocation of reserved land is by declaration by the Administrator following a resolution by the Northern Territory Legislative Assembly.

Management plans are prepared by the Conservation Commission of the Northern Territory for areas under its control and are required under the Territory Parks and Wildlife Conservation Act.

Kakadu National Park, Kakadu (Stage 2) National Park and Uluru (Ayers Rock-Mt Olga) National Park are proclaimed under the National Parks and Wildlife Act, 1975. Kakadu National Park is owned by Aboriginal people and leased to the Director of Australian National Parks and Wildlife Service (ANPWS). Management plans are prepared by ANPWS.

The Cobourg Peninsula Aboriginal Land and Sanctuary Act passed in 1981 established a major national park on Cobourg Peninsula, primarily owned and controlled by Aborigines.

Administration

A Director of Conservation, his Deputy and staff are public servants employed for the purposes of carrying out the functions of the Commission. The Commission administers the Territory Parks and Wildlife Conservation Act as well as legislation relating to forestry, bushfires, soil conservation, urban park development, environmental assessment and botanical services. Day to day management of Uluru National Park is carried out by the Conservation Commission. Kakadu National Park and Kakadu (Stage 2) National Park is managed by Australian National Parks and Wildlife Service staff and seconded Conservation Commission staff.

Designations

National parks: large areas of unspoiled landscape reserved for public enjoyment, education and inspiration.

Conservation reserves: areas set aside for conservation of flora, fauna or for anthropological, natural or scientific values.

Nature parks: land reserved primarily for its suitability for public recreation and enjoyment in a natural environment.

Game reserves: set aside for maintenance of game which can be harvested under permit.

Historical reserves: areas set aside for their historical significance even though they may be used for other purposes such as recreation.

Addresses

Conservation Commission of the Northern Territory	
PO Box 1046	Gap Road
ALICE SPRINGS NT 5750	ALICE SPRINGS NT
Phone (089) 50 8211	

QUEENSLAND

Legislation

National parks are established under the National Parks and Wildlife Act, 1975-84 to conserve areas of scenic, scientific or historic interest. They are permanently reserved and can be revoked only with the authority of Parliament though under certain circumstances land can be excised by Order in Council for tourist purposes or for roads.

The National Parks and Wildlife Act prescribes that 'the cardinal principle to be observed in the management of national parks shall be the permanent preservation to the greatest possible extent of their natural condition'. Provision is made for declaration within national parks of special management zones, including primitive areas, primitive and recreation areas, recreation areas, scientific areas and historic areas.

The Fauna Conservation Act, 1974-79 provides for fauna reserves and fauna refuges — the latter may be declared over land of any tenure with the agreement of the landholder. Fauna sanctuaries are also established under this Act to protect fauna but not habitat, though in general, a sanctuary is declared only if habitat protection is otherwise assured in the state of Queensland. All national parks and all islands off the coast are fauna sanctuaries.

Provision for the establishment of environmental parks and scientific purpose reserves (department and official purposes reserves) is contained in the Land Act, 1962-84 and in particular in the Land Amendment Act of 1973.

Administration

The National Parks and Wildlife Act 1975 provides for the establishment of a National Parks and Wildlife Service and for the appointment of a Director of National Parks and Wildlife to administer the Act, the environmental park provisions of the Land Act, the Fauna Conservation Act and the Native Plants Protection Act.

Designations

National parks: relatively large areas of natural landscape with a high level of diversity of flora and fauna and which may be of historic interest. They are permanently dedicated for public enjoyment and education and protected from all interference other than essential management practices to ensure that the natural attributes are preserved.

Environmental parks: natural or near natural areas, less outstanding in size or natural attributes than national parks, totally protected for public enjoyment.

Fauna reserves: areas of land held permanently in their natural state. They are undisturbed other than by naturally occurring processes and are closed to the public.

Fauna refuges: land declared to preserve habitat and protect fauna.

Scientific purpose reserves: (department and official purpose reserves): may be used as a holding tenure where there is an impediment to immediate declaration of a national park or for land for administrative purposes such as office, visitor centre or residence.

Addresses

National Parks and Wildlife Service
PO Box 190
NORTH QUAY QLD 4000
Phone (07) 224 0414

MLC Centre
239 George Street
BRISBANE QLD

SOUTH AUSTRALIA

Legislation

The National Parks and Wildlife Act, 1972-81 provides for the establishment and management of reserves for public benefit and for the conservation of wildlife in a natural environment.

The reserves comprise national parks, conservation parks, game reserves and recreation parks. They may be abolished or their boundaries altered by a proclamation of the Governor, subject to a resolution passed by both Houses of Parliament.

Management plans for each reserve are prepared by the Minister in conjunction with comments and suggestions of the National Parks and Wildlife Reserves Advisory Committee and representations from the public. Objectives in the management of reserves include the preservation and management of wildlife, the preservation of features of geographical, natural or scenic interest and the encouragement of public use and enjoyment of reserves. The management plan may also provide for the division of a reserve into zones which shall be kept and maintained under the conditions declared by the plan.

The National Parks and Wildlife Reserves Advisory Committee, at the request of the Minister, can investigate and advise the Minister upon any matter referred to the Committee for advice. The Committee may also refer any matter affecting the administration of the Act to the Minister for consideration. Five members are appointed to the Committee by the Governor.

Administration

The Director of the National Parks and Wildlife Service is responsible to the Director General of the Department of Environment and Planning. Both are responsible to the Minister for the management of reserves. The National Parks and Wildlife Service constitutes a division of the Department of Environment and Planning. All staff, including the Director, are public servants employed to carry out the functions of the National Parks and Wildlife Act.

Designations

National parks: protected areas of national significance by reason of the wildlife or natural features of those lands'. Generally they are contiguous areas of substantial size, preferably tens of thousands of hectares, with controlled provision for public visitation and enjoyment. They are reserves encompassing many natural values including scenic beauty, wildlife, history and inspiration to visitors.

Conservation parks: lands that should be protected or preserved for the purpose of conserving any wildlife or the natural or historic features of those lands'.

Although these areas may contain all or some of the features represented in national parks, they tend to be subject to less visitation by the public and subsequently are developed to a minimal extent.

Game reserves: lands which should be preserved for the conservation of wildlife and management of game'. Game reserves may be set aside for the purpose of fishing or hunting. These areas have an important conservation role and may be declared open at prescribed times for strictly controlled hunting.

Recreation parks: lands that should be conserved and managed for public recreation and enjoyment'. These areas protect natural values, landscape and historic sites but may also provide facilities for public recreation in a natural setting.

Addresses

National Parks and Wildlife Service,
PO Box 667
ADELAIDE SA 5001
Phone (08) 216 7777

55 Grenfell Street
ADELAIDE SA

TASMANIA

Legislation

The National Parks and Wildlife Act, 1970 provides for the establishment of conservation areas by the Governor's proclamation. Conservation areas may include privately owned lands subject to the consent of the owners. Conservation areas that are crown land may be declared state reserves by Governor's proclamation but may not be revoked unless the Governor's draft proclamation is first approved by each House of Parliament. This proclamation may give a name to the state reserve including that of state reserve, national park, nature reserve, Historic Site or Aboriginal site. Other statutory powers, for example, to grant mining leases or forestry rights, do not apply in state reserves.

Conservation areas may be named wildlife sanctuaries where wildlife and habitat are protected by regulations. Management plans can provide additional protection.

National parks are generally outstanding natural areas greater than 4,000 ha. Nature reserves comprise areas of significant natural features reserved for nature conservation and scientific study. Crown land conservation areas may also be declared game reserves where management is aimed at producing native or introduced game species which may be hunted in season.

Management plans are required to be prepared in respect of all areas proclaimed under the Tasmanian National Parks and Wildlife Act. These are required to be publicly displayed and comment sought before being approved by the Governor. Where provision is made for use of a state reserve other than as provided for in the Act, the management plan requires the approval of both Houses of Parliament.

Administration

State reserves, game reserves and conservation areas are administered by the Tasmanian National Parks and Wildlife Service established under the Act. Whereas some conservation areas are administered by the Service as wildlife sanctuaries, there are in addition, approximately thirty-five conservation areas proclaimed where other government authorities or the owner of the lands are the managing authorities.

Designations

State reserves —

National parks: extensive areas for the conservation of natural ecosystems, enjoyment and study of the natural environment and public recreation/tourism.

State reserves: generally small reserves set aside for scenic and recreational reasons and/or to protect geological sites.

Nature reserves: areas set aside because of the significance for nature conservation. Public use is not encouraged where this might be detrimental although provision may be made for appropriate tourism and recreational activities.

Aboriginal sites: areas containing relics of Aboriginal people or known to be of significance to them. Degree of public use will depend on needs of site for protection.

Historic Sites: areas of significance in terms of European exploration, settlement or use, with encouragement of tourism and recreational use.

Game reserves —

Game reserves: essentially the same as nature reserves except that specific provisions are made for hunting and the maintenance of game populations.

Conservation areas —

Conservation areas: large multiple use reserves set aside primarily to protect animals and their habitats and to provide for recreation and controlled use of resources.

Muttonbird reserves: reserves where special provision is made for private and commercial muttonbirding.

Addresses

National Parks and Wildlife Service
PO Box 210
SANDY BAY TAS 7005
Phone (002) 30 8033

Magnet Court
SANDY BAY TAS

VICTORIA

Legislation

Under the National Parks Act, 1975, provision is made for the establishment of national parks and other parks for the preservation and protection of the environment including indigenous flora and fauna and features of scenic, archeological, geological, historical or scientific interest. National parks and other parks may be zoned by publication of the Governor's proclamation to that effect. New national parks and other parks may be established by parliamentary amendment of the appropriate schedules to the National Parks Act to include the name and description of the lands included in the park. Provision is also made in the Act for the National Parks Service to manage land not reserved in the Schedules to the Act. National parks comprise predominantly unspoilt landscapes and are of extensive size whereas other parks are usually of relatively less size or significance. The Act makes statutory provision for special works to be conducted in certain parks and provides the Director of National Parks with authority to manage parks generally.

Under the Crown (Land) Reserves Act, 1978, state wildlife reserves may be established for the preservation or management of wildlife or wildlife habitat.

State wildlife reserves may be further classified as state game reserves, state nature reserves and other classifications, such as state parks, by order of the Governor.

Any proclamation or order made by the Governor may be similarly revoked or varied. State game reserves are specifically managed for waterbird conservation. State nature reserves are managed for non-game wildlife species and shooting is prohibited. State parks cater for general and specific species of flora and fauna as well as recreation and education within a natural environment.

Under the Wildlife Act, 1975, the Director of the Fisheries and Wildlife Service is required to prepare as soon as practicable a plan of management for each wildlife reserve. The Minister may adopt or vary such plans.

Administration

The National Parks Act established a Director of National Parks to administer national parks. He is assisted by a National Parks Service consisting of officers appointed under the Public Service Act. The National Parks Act also provides for the appointment of a National Parks Advisory Council to advise the responsible Minister on national park matters.

A Director of Fisheries and Wildlife is appointed under the Public Service Act and, subject to the control of the Minister, administers the Wildlife Act, 1975, including the management of state wildlife reserves.

Designations

National parks: crown land characterised by its predominantly unspoilt landscape, and its flora, fauna or other features, which is reserved and protected permanently for the benefit of the public.

Other parks: areas with scenic, historical, archaeological, biological, geological or other features of scientific interest that are worthy of preservation but, whether by reasons of the limited size of the areas or the limited significance of the features are not suitable for reservation as national parks; areas that demonstrate human effect on the environment whether through agricultural or pastoral pursuits or otherwise; areas in or adjacent to urban areas of natural beauty or interest or otherwise suitable for recreational use; areas of natural beauty or interest primarily for recreational and educational use but parts of which may be used for primary industry, hunting, shooting, fishing or other uses appropriate to the areas; and areas in their natural state for scientific study or reference.

Other parks are generally classified into coastal parks, historic parks, state parks and parks. Other areas include flora and fauna reserves and reserves.

State game reserves and state nature reserves: defined as land reserved primarily for management and conservation of wildlife and any recreational use providing it doesn't conflict with the primary aim. State game reserves are wetlands open to duck hunting in season while state nature reserves are wetlands and drylands closed to hunting at all times.

State parks: primarily reserved for public recreation and the conservation of the natural environment.

Addresses

National Parks Service
Department of Conservation,
Forests and Lands
240 Victoria Parade
EAST MELBOURNE VIC 3002
Phone (03) 651 4011

Fisheries and Wildlife Service
Department of Conservation,
Forests and Lands
250 Victoria Parade
EAST MELBOURNE VIC 3002
Phone (03) 651 4011

WESTERN AUSTRALIA

Legislation

Under the Land Act, 1933, the Governor may reserve land for public purposes. Notice of such reservations is published in the Gazette. The Governor may also proclaim reserved areas as Class A, B or C. Class A reserves remain dedicated for the purpose declared in the proclamation until revoked by Act of Parliament. Class B reserves may be revoked by the Governor by notice in the Gazette subject to the Minister for Lands presenting a report explaining the reasons for any revocation or alteration to both Houses of Parliament. Class C reserves may be revoked or altered by Gazettal of a Ministerial Notice to that effect.

The Land Act provides that the Governor may vest reserves in a private body, semi-government or government authority for specific purposes. In Western Australia, Class A, B or C reserves vested in the Western Australian Wildlife Authority or the Western Australian National Parks Authority are commonly reserved for the purposes of conservation of fauna or flora or both, national parks or any of these purposes plus some other purpose.

Administration

Under the Wildlife Conservation Act, 1950-80, the Western Australian Wildlife Authority is established to advise on the conservation of fauna and flora, to carry out appropriate research and to manage nature reserves. Under the Land Act most areas reserved for the purposes of conservation of flora and fauna are vested in the Western Australian Wildlife Authority which may classify nature reserves or parts of such reserves for particular purposes such as hunting or limited access.

The Wildlife Conservation Act is administered by the Conservator of Wildlife appointed under that Act who is responsible to the Director of the Department of Fisheries and Wildlife. Both are members of the Authority which consists of four ex officio and eight appointed members.

Under the National Parks Authority Act, 1976, the National Parks Authority of Western Australia was established to replace the former National Parks Board of Western Australia. The Authority manages areas vested in it, provides and maintains facilities for the enjoyment of natural areas by the public and undertakes other necessary functions for the management of national parks and reserves. It consists of a President nominated by the Minister, the Conservator of Forests, the Director of Fisheries and Wildlife, the Director of the Department of Tourism, the Surveyor-General and four persons representing the public nominated by the Minister.

The National Parks Authority Act provides for the establishment of national parks comprising scenic, aesthetic, recreational, biological or other special features. The Act provides for the appointment of a Director to formulate policies for the care, control and management of national parks generally. The Director is subject to the provisions of the Public Service Act, 1904 and is responsible for the administration of the Authority and its staff.

Designations

National parks: established to preserve for all times scenic beauty, wilderness, native wildlife, indigenous plant life and areas of scientific importance and to provide for the appreciation and enjoyment of those things by the public in such a manner and by such means as will leave them unimpaired for the future.

Reserves: usually small areas set aside for recreation and the conservation of flora and fauna.

Nature reserves: defined by the Wildlife Conservation Act as 'land reserved for the conservation of flora and fauna'.

Addresses

Western Australian Wildlife
Authority
Department of Conservation and
Land Management
108 Adelaide Terrace
PERTH WA 6000
Phone (09) 325 5988

National Parks Authority
of Western Australia
Department of Conservation
and Land Management
Hackett Drive
NEDLANDS WA 6009
Phone (09) 386 8811

APPENDIX 2CNPPA CLASSIFICATION SYSTEMPRELIMINARY CLASSIFICATION OF N.S.W. NPWS AREAS AT 30/6/80

<u>National Parks</u> <u>Name</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>	<u>National Parks</u> <u>Name</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>
Apsley Gorge	*II	Mallee Cliffs	IV
Bald Rock	III	Narra Marra	II
Barrington Tops	II	Mimosa Rocks	*II
Ben Boyd	II	Morton	II
Blue Mountains	II	Mt. Imlay	III
Border Ranges	*II	Mt. Kaputar	II
Bouddi	**II	Mt. Warning	III
Brisbane Water	II	Mungo	II
Broadwater	II	Murramarang	II
Budawang	II	Myall Lakes	II
Bundjalung	II	Nalbaugh	**II
Cathedral Rock	II	New England	II
Cocoparra	II	Nungatta	**II
Crowdy Bay	II	Royal	II
Deua	II	Seven Mile Beach	**II
Dharug	II	Sturt	II
Dorrigo	II	Sydney Harbour	V
Gibraltar Range	II	Thirlmere Lakes	III
Guy Fawkes	II	Wadbilliga	II
Hat Head	II	Wallaga Lake	**II
Heathcote	**II	Warrumbungle	II
Kanangra Body	II	Weddin Mts.	II
Kinchega	II	Werrikimbe	II
Kosciusko	II, IX	Willandra	V
Ku-ring-gai Chase	II	Wollemi	II
Macquarie Pass	**II	Yuraygir	II

SUMMARY

45 to be classified Category II National Park (38 to CNPPA standard, 7 small National Parks).

4 to be classified Category III Natural Landmark.

1 to be classified Category IV Managed Nature Reserve.

2 to be classified Category V Protected Landscape.

Total area t 1980 - 2,421,851 ha.

* Assumes additions to create a large national park

** One of the small "State Park" areas.

<u>Nature Reserves</u> <u>Name</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>	<u>National Parks</u> <u>Name</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>
Awabakal	IV	Gurumbi	I
Badja Swamps	I	Guy Fawkes River	I
Baldy Island	I	Illawong	I
Ballina	IV	Illuka	IV
Bandicoot Island	IV	Ingalba	I
Banyabba	II	John Gould	I
Barren Grounds	IV	Julian Rocks	I
Barton	I	Kajuligah	IV
Bell Bird Creek	I	Kororo	I
Belowla Island	I	Limeburners Creek	II
Berkeley	IV	Limpinwood	I
Bermagabee	I	Linton	IV
Binnaway	I	Lion Island	I
Bird Island	I	Little Broughton Island	I
Black Ash	I	Little Llangothlin	I
Boomi	I	Long Island	IV
Boomi West	I	Macquarie	V
Boondelbah	I	Macquarie Marshes	IV
Boorganna	IV	Manobalai	I
Boronga	I	Midkin	I
Bournda	IV	Moffats Swamp	I
Bowraville	I	Moon Island	I
Broken Head	IV	Moonee Beach	I
Broulee Island	IV	Mother of Ducks Lagoon	IV
Brunswick Heads	IV	Mount Seaview	I
Brush Island	IV	Mundoonen	I
Buddigower	I	Munghorn Gap	IV
Bungawalbin	I	Muogamarra	IV
Burning Mountain	III	Muttonbird Island	IV
Careunga	I	Nadgee	II
Cecil Hoskins	V	Narrandera	I
Cedar Bush	I	Mearie Lake	I
Cocoparra	I	Necoleche	I
Cook Island	IV	North Rock	I
Coolbaggie	I	North Solitary Island	I
Coolongolook	IV	North-West Solitary island	I
Copperhannia	I	Pantoneys Crown	I
Coturaundee	IV	Pilliga	II
Cudmirrah	IV	Pitt Town	IV
Curumbenya	IV	Pulbah Island	IV
Dalrymple Hay	IV	Pulletop	I
Davis Scrub	I	Quanda	I
Devils Glen	I	Red Rocks	I
Egan Peaks	I	Regatta Island	IV
Eugowra	I	Robertson	IV
Evans Crown	III	Rodway	I
Five Islands	I	Round Hill	I
Flagstaff Memorial	IV	Rowleys Creek Gulf	I
Fremantle	I	Seaham Swamp	IV
Georges Creek	I	Seal Rocks	I
Goonawarra	I	Serpentine	I
Goorooyarro	I	Severn River	II
Goura	I	Sherwood	IV
Gubbata	I	South-west Solitary Island	I
Specatacle Island	I	Warrabah	II
Split Solitary Island	I	Watsons Creek	I
Stormpetrel	I	Wee Jasper	I

Stotts Island	IV	WeeĪah	I
Tabletop	IV	Weetalibah	I
The Basin	I	Willi Willi Caves	I
The Charcoal Tank	I	Winburndale	IV
The Hole Creek	I	Wingen Maid	I
The Rock	IV	Woggoon	I
Tollgate Islands	I	Wongarbon	I
Tucki Tucki	IV	Yanga	I
Uralba	I	Yarravel	I
Victoria Park	IV	Yathong	I, IX
Wallabadah	I		

SUMMARY

86 Nature Reserves	classified as Category	I - Scientific Reserve
6 Nature Reserves	classified as Category	II - National Park
2 Nature Reserves	classified as Category	III - Natural Landmark
39 Nature Reserves	classified as Category	IV - Managed Nature Reserve
2 Nature Reserves	classified as Category	V - Protected Landscape
1 Nature Reserve	classified as Category	IX - MAB Biosphere Reserve.

Total Area at 1980 - 448,271 ha.

APPENDIX 3CNPPA CLASSIFICATION SYSTEMPRELIMINARY CLASSIFICATION OF VICTORIAN AREAS AT 1/5/85

<u>National Parks</u> <u>(over 1000 ha)</u>	<u>Size (ha)</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>
Lind	1,166	II
Mount Richmond	1,707	II
Port Campbell	1,750	II
Alfred	2,300	II
Fraser	3,750	II
The Lakes	2,390	II
Brisbane Ranges	7,517	II
Kinglake	11,390	II
Otway	12,750	II
Baw Baw	13,300	II
Burrowa - Pine Mount.	17,600	II
Tingaringy	18,000	*
Snowy River	26,200	II
Lower Glenelg	27,300	II
Mount Buffalo	31,000	II
Little Desert	35,300	II
Hattah Kulkyne	48,000	II, IX
Wilsons Promontory	49,000	II, IX
Bogong	81,200	*
Croajingolong	86,000	II, IX+
Wyperfeld	100,000	II
Wonnangatta-Moroka	107,000	*
Grampians	167,000	II
<hr/>		
Total	851,620	
<hr/>		

* These three parks are, except for the continuation of cattle grazing and, in the case of Bogong National Park, a small mine, managed as Category II National Parks.

+ An additional 14,800 ha of Nadjee Nature Reserve in New South Wales is included in the Croajingolong National Biosphere Reserve.

<u>Other Parks</u> <u>(over 1000 ha)</u>	<u>Size (ha)</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>
Mt Worth SP	1,040	-
Cape Schanck CP	1,095	II
Lysterfield P	1,151	-
Nepean SP	1,151	-
Murray Kulkyne P	1,550	II, IX
Warby Range SP	3,320	II
Cathedral Range SP	3,577	II
Chiltern SP	4,255	-
Mt Samaria SP	7,600	II
Discovery Bay CP	8,530	II
Holey Plains SP	10,450	II
Lake Albacutya P	10,700	-
Coopracambra SP	14,500	II
Gippsland Lakes CP	16,500	II
Wabonga Plateau SP	21,200	II
Eildon SP	24,000	II
Pink Lakes SP	50,700	II
Big Desert Wilderness	113,500	II
<hr/>		
Total	294,819	
<hr/>		

SP: State Park

CP: Coastal Park

P: Park

<u>Nature Reserves</u> <u>(over 1000 ha)</u>	<u>Size (ha)</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>
Reedy Lake	1,400	I
Wandown	1,591	I
Western Port	1,650	I
Lake Timboram	2,060	I
Kings Billabong	2,166	I
Tooloy	2,416	I
Rocky Range	4,453	I
Wathe	5,763	I
The Stones	6,218	I
Red Bluff	8,800	I
Nooramunga	9,996	I
Bronzewing	11,200	I
<hr/>		
Total	57,713	
<hr/>		

IUCN CATEGORIES

Category I	57,713
Category II	921,942
Category IX	*84,550

* This figure comprises areas also included in Category II. An additional 14,800 ha in New South Wales constitutes part of Croajingolong National Park Biosphere Reserve.

TOTAL AREA UNDER PROTECTION (ha) (Area over 1,000 ha).

Victorian designations

National Parks	851,620
Other Park	294,819
Nature Reserves	<u>57,713</u>
Total	<u>1,204,152</u>

APPENDIX 4

PRELIMINARY CLASSIFICATION OF SOUTH AUSTRALIAN
NPWS AREAS AT 30/4/85

<u>National Parks</u> <u>Name</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>	<u>National Parks</u> <u>Name</u>	<u>Tentative</u> <u>CNPPA</u> <u>Classification</u>
Canunda	?	Gammon Ranges	II
Coffin Bay	II	Innes	II
Coorong*	II, VIII	Lincoln	II
Flinders Chase	II	Mount Remarkable	II
Flinders Ranges	II	Nullarbor	II
<u>Conservation parks</u>			
<u>Name</u>			
Althorpe Islands	II	Dudley	II
Avoid Bay Islands	II	Eba Island	II
Baird Bay Islands	II	Elliot Price	II
Bangham	II	Erick Bonython	II
Bascombe Well	II	Eurilla	II
Baudin Rocks	III	Ewens Ponds	II
Beachport	II	Fairview	II
Beatrice Islet	II	Ferguson	II
Belt Hill	III	Ferries McDonald	II
Big Heath	II	Finniss	II
Billiatt	II	Fort Glanville	VI
Bird Island	II	Franklin Harbor	II
Black Hill	II	Furner	II
Block Rock	II	Gambier Islands	II
Brookfield	II	Glen Roy	II
Busby Islet	II	Goose Island	II
Calectasia	III	Gower	II
Calpatanna Waterhole	II	Grass Tree	II
Cap Island	II	Greenly Island	II
Cape Gantheaume	II	Guichen Bay	II
Cape Hart	II	Gum Lagoon	II
Cape Torrens	II	Hacks Lagoon	IV
Carappee Hill	III	Hale	II
Carcuma	II	Hallett Cove	III
Carribie	II	Hambridge	II
Charleston	II	Hincks	II
Cleland	II	Horsnell Gully	II
Climton*	II	Investigator Group	II
Corrobinnie Hill	III	Isles of St Francies	II
Coxs Scrub	II	Jip Jip	III
Cromer	II	Kaiserstuhl	II
Cudlee Creek	II	Kapunda Island	II
Danggali	II, X	Karte	II
Deep Creek	II	Kellidie Bay	II
Desert Camp	II	Kelly Hill	II
Dingley Dell	VI	Kelvin Powrie	III
Kyeema	II	Pooginook	II
Lake Gillies	II	Port Gawler*	II
Laura Bay	II	Pullen Island	II
Lipson Island	II	Reedy Creek	?
Little Dip	II	Ridley	II
Lowan	II	Rilli Island	II

Maize Island Lagoon	VI	Rocky Island (north)	II
Marne Valley	II	Rocky Island (south)	II
Martins Washpool	II	Roonka	VI
Mary Seymour	II	Rudall	II
Media Island	II	Salt Lagoon Islands	I
Messent	II	Sandy Creek	II
Middlecamp Hills	II	Scorpion Springs	?
Monato	II	Scott	II
Montacute	II	Seal Bay	II
Morgan	VI	Seddon	II
Morialta	II	Sheaoak Hill	II
Mount Boothby	II	Simpson Desert	II
Mount Dutton Bay	II	Sinclair Island	II
Mount Magnificent	II	Sir Joseph Banks Group	II
Mount Monster	III	Sleaford Mere	III
Mount Rescue	II	Sprin Gully	III
Mount Scott	II	Spring Munt	II
Mount Shaugh	II	Swan Reach	II
Mount Taylor	III	Talapar	II
Mullinger Swamp	III	Tantanoola Caves	III
Mundoora (Clements Gap)	II	Telowie Gorge	III
Munyaroo	II	The Knoll	VI
Murranatta	II	The Pages	II
Myponga	II	Torrens Island	II
Naracoorte Caves	III	Troubridge Island	II
Nene Valley	II	Tumby Island	II
Nepean Bay	II	Unnamed	II, X
Neptune Islands	II	Venus Bay	II
Ngarkat	II, X	Verran Tanks	II
Ngautngaut	VI	Vivonne Bay	II
Nixon Skinner	II	Waitpinga	II
Nuyts Archipelago	II	Waldegrave Islands	II
Nuyts Reef	II	Wanilla	II
Olive Island	II	Warren	II
Padthaway	II	Warenben	II
Pandappa	II	West Island	II
Pardana	II	Western River	II
Peebinga	II	Whidbey Isles	II
Pelican Lagoon	II	White Dam	II
Penguin Island	II	Whites Dam	?
Penola	II	Whyalla	II
Piccaninnie Ponds	III	Wittlebee	II
Pigface Island	II	Yalpara	II
Pike River	VI	Ylte	II
Pinawillinie	II	Ymbarra	II
Point Labatt	III		

Recreation parks

<u>Name</u>			
Belair	II	Glossop	?
Brownhill Creek	VI	Greenhill	VI
Caratoola	VI	Kinston Park	VI
Lenswood	VI	Shepherds Hill	?
Loftia	VIII	Sturt Gorge	VIII
Long Island	II	The Elbow	VI
Para Wirra	II	Totness	VI
		Windy Point	VI

Game Reserves

<u>Name</u>			
Bool Lagoon	VIII	Katarapko	VIII
Bucks Lake	II	Moorook	VIII
Coorong	VIII	Mud Islands	VIII
Currency Creek	VIII	Tolderol	VIII

* Partly a marine or estuarine protected area.

APPENDIX 5AUSTRALIA'S BIOSPHERE RESERVES

		<u>Area (ha)</u>	<u>State</u>
ABR1	Uluru (Ayers Rock - Mt Olga National Park	132,538	N.T.
ABR2	Danggali Conservation Park	253,230	S.A.
ABR3	Kosciusko National Park	625,525	N.S.W.
ABR4	Unnamed Conservation Park of Australia	2,132,600	S.A.
ABR5	Yathong Nature Reserve	107,241	N.S.W.
ABR6	Croajingalong National Park	100,800	Vic
ABR7	Macquarie Island Nature Reserve	12,343	Tas
ABR8	South-West National Park	442,240	Tas
ABR9	Rattah-Kulkyne National Park & Murray-Kulkyne Park	49,550	Vic
ABR10	Prince Regent River Nature Reserve	633,825	W.A.
ABR11	Fitzgerald River National Park	242,739	W.A.
ABR12	Wilsons Promontory National Park	49,000	Vic

AUSTRALIA'S WORLD HERITAGE PROPERTIES

		<u>Area (ha)</u>	<u>State</u>
1.	The Great Barrier Reef	34,870,000	Qld
2.	The Lord Howe Island Group	3,003	N.S.W.
3.	The Willandra Lakes Region	600,000	N.S.W.
4.	Kakadu National Park	614,400	N.T.
5.	Western Tasmania Wilderness National Parks	769,355	Tas

EXAMPLES OF INFORMATION

<u>NAME</u>	Namadji National Park	
<u>CATEGORY</u>	National Park (NP) II	SHEETS ON AUSTRALIAN PROTECTED AREAS
		UDVARDIAN PROVINCE NUMBER 6.6.6
		NAME Eastern Schlerophyll
<u>LEGAL PROTECTION</u>	100%	
<u>DATE ESTABLISHED</u>	3 October 1984	
<u>GEOGRAPHICAL LOCATION</u>	South-western part of the Australian Capital Territory, 35km from Canberra: S35°40'; E149°00'.	
<u>ALTITUDINAL RANGE</u>	900-1911 metres	
<u>AREA</u>	94,000ha.	
<u>LAND TENURE</u>	Public (Australian Capital Territory)	
<u>PHYSICAL FEATURES</u>	A series of mountain ranges and steep sided valley, parts with sub-alpine climate, dry and wet schlerophyll woodland and forest with alpine heaths, bogs and swamps.	
<u>VEGETATION TYPES</u>	Sub-alpine woodland (<i>Eucalyptus pauciflora</i> and <i>E. pauciflora</i> var <i>debeuzevillei</i>), montane savannah woodland (<i>E. pauciflora</i> and <i>E. stellulata</i>) wet schlerophyll forest (<i>E. delagateusis</i> and <i>E. fastigata</i>) and montane and sub-alpine heaths, herb-fields, bogs and swamps and grasslands.	
<u>NOTEWORTHY FAUNA</u>	Broad-toothed rat (<i>Mastacomys fuscus</i>), River blackfish (<i>Gadopsis mameratus</i>), Bogong moth (<i>Agrotis infusa</i>), Mountain grasshopper (<i>Aeripeza reticulata</i>), Gang-gang cockatoo (<i>Callocephalon fimbriatum</i>), Koala (<i>Phascolarctos cinereus</i>) and Platypus (<i>Ornithorhyncus anatinus</i>).	
<u>ZONING</u>	Water catchment 30%, wilderness 20%, bushland recreation 50%.	
<u>DISTURBANCES OR DEFICIENCIES</u>	2 water supply dams and reservoirs, 2 former space tracking stations, 2500ha grazing lease, 284ha pine plantation, road and power easements.	
<u>SCIENTIFIC RESEARCH</u>	Area used for field studies, forest ecology and hydrology, flora and fauna management by the Commonwealth Scientific and Industrial Research Organisation, Australian National University, Canberra College of Advanced Education.	
<u>SPECIAL SCIENTIFIC FACILITIES</u>	Aboreta, hydrological stations, meteorological stations.	
<u>PRINCIPAL REFERENCE MATERIAL</u>	Draft Policy and Development Plans, National Capital Development Commission, Draft Management Plan Department of Territories, Ecological Resources of the Australian Conservation Foundation, NCDC Technical Paper No. 42.	
<u>STAFF:</u>	2 Managers, 6 Rangers, 3 Park Assistants.	
<u>BUDGET</u>	1984/85 \$Aust 204,000 local operational costs.	

LOCAL PARK OR RESERVE ADMINISTRATION

The Australian Capital Territory Parks and Conservation Service, G.P.O. Box
158, Canberra, A.C.T., 2601.

NAME OF CNPPA CO-ORDINATOR Mr D. Kerr (062) 462-363.

DATE May, 1985.

NAME Tidbinbilla Nature Reserve

CATEGORY Managed Nature Reserve (NR) IV
UDVARDIAN PROVINCE NUMBER 6.6.6
NAME Eastern Schlerophyll

LEGAL PROTECTION 100%

DATE ESTABLISHED 1965

GEOGRAPHIC LOCATION

South of Canberra in the Australian Capital Territory, 50km from Canberra: S35°27'; E169°55'.

ALTITUDINAL RANGE 700-1,562 metres.

AREA 5,515ha

LAND TENURE Public (Australian Capital Territory)

PHYSICAL FEATURES

Forms part of the highlands of south-east Australia. It encompasses a diverse array of valley floors and mountain ranges.

VEGETATION TYPES:

Dry sclerophyllous forest on slopes, savannah woodland on valley floors.

NOTEWORTHY FAUNA

4 species of Macropods, emus (reintroduced), koalas (reintroduced), platypus, and other mammals, reptiles, birds, representative of south-eastern Australia. An extensive system of managed waterfowl and animals enclosures containing other examples of Australian native fauna.

ZONING

Development zone (animal enclosures and recreational facilities) 12%, natural zone 88%.

DISTURBANCES OR DEFICIENCIES

Previous history of clearing for grazing in valley floors.

SCIENTIFIC RESEARCH

Used by Commonwealth Scientific Industrial Research Organisation, Australian National University, Canberra College of Advanced Education, for field studies on ecology, parasitology, archaeology, recreation.

PRINCIPAL REFERENCE MATERIAL

Gill A.M. & Ingwersen, F. (1976). The Growth of *Xanthorrhoea australis* R.Br. in relation to Fire.

J. Appl. Ecol. 13 195-203. Margules, S.R. & Assoc. (1968). Tidbinbilla Nature Reserve - a general Development Plan, Department of the Interior, Canberra.

STAFF

1 Manager, 1 Technical Assistant Animal Attendant, 1 Information Officer, 4 Rangers, 5 Park Assistants.

BUDGET

1984/85 \$Aust 366,200 local operational costs.

LOCAL PARK OR RESERVE ADMINISTRATION

A.C.T. Parks and Conservation Service, G.P.O. 158, Canberra, A.C.T. 2601.

NAME OF CNPPA CO-ORDINATOR

Mr D. Kerr (062) 462-363.

DATE

May, 1985

NAME Guy Fawkes River National Park

MANAGEMENT CATEGORY II BIOTIC PROVINCE 6.5.1

LEGAL PROTECTION Total

DATE ESTABLISHED 1972 by gazettal

GEOGRAPHICAL LOCATION

North-eastern New South Wales: S 29°55'-30°13'; E 152°10'-152°22'.

ALTITUDE 250-1,372 metres

AREA 33,854 ha

LAND TENURE Crown land

PHYSICAL FEATURES

Entire central and lower catchment of the Guy Fawkes River which serves as a structural boundary between the Dorrigo plateau to the east and the New England tableland. The topography is quite spectacular with steep slopes and vertical rock walls. The underlying geological substrate is Paleozoic sandstone, limestone and shales subjected to prolonged volcanic activity with massive granite intrusions and basalt flows. Erosion has since exposed large areas of the granite and removed most of the basalt. Sub-tropical highland climate.

VEGETATION

The major vegetation is sclerophyllous forest with wet sclerophyllous forest in the areas with better soils. Characteristic species include New England blackbutt *Eucalyptus campanulata*, narrow leaved stringybark *E. cameroni*, messmate *E. obliqua* among others. Trees in this formation reach 25-40m with a sparse ground cover. Dry sclerophyll forest averages 18-30m with moderate ground cover: principal species include grey gum *Eucalyptus propinqua*, grey ironbark *E. paniculata* and, again, *E. cameroni*. Woodland occupies high exposed country and has a scatter of small trees with snow gum *E. pauciflora*. Rainforest with red cedar *Toona australis* also occurs.

NOTEWORTHY FAUNA

Large variety of available habitats in unaltered condition. Mammals include black-tailed phascogale *Phascogale tapatafa*, greater glider or flying phalanger *Schoinobates volans*, red-legged pademelon *Thylogale stigmatica*, black-tailed or swamp wallaby *Wallabia bicolor* and wallaroo *Macropus robustus*. Avifauna includes painted quail *Turnix varia*, wonga pigeon *Leucosarca melanoleuca*, noisy pitta *Pitta versicolor*, spine-tailed logrunner *Orthonyx temmincki*, red-wattle bird *Anthochaera carunculata*, yellow-faced honeyeater *Meliphaga chrysops* and pied currawong *Strepera graculina*. The diamond python *Python (Morelia) spilotes* and common black snake *Pseudechis porphyriacus* have been noted among the reptiles.

CONSERVATION MANAGEMENT

No management plan extant nor proposed at present. Management programmes are part of District planning. Fire management plans and quarterly reports of visitor use have been compiled. Some brochures are available.

ZONING: National Park

DISTURBANCES OR DEFICIENCIES

Poaching and wild fires; cattle-ranching, forestry and some mining in the vicinity.

TOURISM: Undeveloped, but the park is visited by walkers, campers, naturalists and anglers.

SCIENTIFIC RESEARCH: Extensive vegetation survey by Beadle and Costin.

SPECIAL SCIENTIFIC FACILITIES: None

PRINCIPAL REFERENCE MATERIAL: National Parks and Wildlife Service reports.

STAFF: Managed as part of staff of the Armidale District.

BUDGET: No separate dissection of staff or funds for this District.

LOCAL PARK ADMINISTRATION: Armidale District Office, National Parks and Wildlife Service, 1st Floor Legacy House, Faulkner Street, Armidale, NSW 2350.

NAME Kanangra-Boyd National Park

MANAGEMENT CATEGORY II BIOTIC PROVINCE 6.5.1

LEGAL PROTECTION Total

DATE ESTABLISHED 1969

GEOGRAPHICAL LOCATION

Central eastern New South Wales: S 33°52'-34°07'; E 149°58'-150°12'.

ALTITUDE 229-1,289 metres, mean 760 metres

AREA 68,627 ha

LAND TENURE Crown Land

PHYSICAL FEATURES

Steeply dissected country located on the eastern margin of a high plateau which is abruptly terminated to the south and east by the gorges of the Kowmung, Kanangra and Jenolan rivers. The plateau consists of folded Devonian sandstone with residually bedded Permian caps; an area of granite intrusion on the Boyd plateau is also within the park. Coarse skeletal soils on the granite, sandy skeletal soils on the plateau, with brown and red meadow podsoles in valleys. Temperate highland climate, average daily mean temperature 12.33°C, average monthly rainfall 135mm.

VEGETATION

Open forest, wet sclerophyllous type with *Eucalyptus drives*, *E. radiata*, *E. stricta*, *E. fastigata*, *E. viminalis*, *E. dalrympleana* and *E. paucifolia* and *E. paniculata*, also open scrub or mallee with *E. stricta*.

NOTEWORTHY FAUNA

Brush-tailed wallaby *Petrogale penicillata*, sugar glider *Petaurus breviceps*, grey glider *P. norfolcensis*, koala *Phascogale cinereus* and red-necked pademelon *Thylogale thetis*; avifauna includes the superb lyre-bird *Menura superba* and the satin bower-bird *Ptilonorhynchus violaceus*.

CONSERVATION MANAGEMENT

Plan of management in preparation to be exhibited in 1986.

ZONING: National Park

DISTURBANCES OR DEFICIENCIES

Fire, off-road vehicles, trail bikes, water board catchment management activities.

TOURISM

Adjacent to the northern boundary of the park at the Jenolan limestone caves: car parks, picnic areas and a hotel.

SCIENTIFIC RESEARCH No information.

SPECIAL SCIENTIFIC FACILITIES No information.

PRINCIPAL REFERENCE MATERIAL

No specific publications are quoted but there is a fairly large scale map showing the park boundaries, contours and other cadastral information. A bibliography is in preparation.

STAFF

Managed as part of the staff of Blue Mountains District.

BUDGET

No separate dissection of funds and staff for this District.

LOCAL PARK ADMINISTRATION

Blue Mountains District Office, National Parks and Wildlife Service, 65
Leichardt Street, Black Heath, NSW.

NAME Cobourg Peninsula National Park

TYPE National Park BIOTIC PROVINCE 6.6.1

LEGAL PROTECTION Total

DATE ESTABLISHED

Gazetted a Flora and Fauna Reserve in 1924; declared a Sanctuary in 1963; became a National Park by Cobourg Peninsula Aboriginal Land and Sanctuary Act 1981.

GEOGRAPHICAL LOCATION

A peninsula on north west coast of Arnhem Land: all mainland north of S 11°30' and east of E 131°40', plus Sandy Island No. 1 S 11°7'10"; E 132°11'20" and Sandy Island No. 2 S 11°6'15"; E 132°17'30"

ALTITUDE Sea level to 160 metres.

AREA 191,659 ha

LAND TENURE Total

PHYSICAL FEATURES

A low gently undulating peninsula, the highest points being Mount Bedwell (132m) and Mount Roe (160m). Sandy loams or lateritic soils support eucalyptus forests with monsoon forests in some clay loams near the coast. Freshwater or brackish lagoons occur in some areas behind coastal dunes. Rocky outcrops occur in a few places. Average rainfall varies from 1270-1396mm with over 1016mm falling from December to February. Temperatures are high all year, with July temperatures of 20°C-31°C and December temperatures from 25.5°C to 34°C. Extensive fires occasionally occur during the drier months.

VEGETATION

5 general types of vegetation present. The dominant type over much of the area is tall forest of Darwin stringybark *Eucalyptus tetradonta* and woollybutt *E. miniata* with sand palm *Livistona humilis* the dominant in the dense understory. On sandier soils there are some pure stands of a cypress pine *Callitris intratropica*. A few small areas of monsoon forest fringe freshwater streams and lagoons and are found behind the beach dunes, which are clothed with such prostrate and often spiny plants as *Ipomoea pescapra*, *Tribulus cistoides*, *Boerhavia diffusa*, *Vitex rotundifolia*, *Euphorbia serrulata* and *Spinifex longifolius* grass. Swampy areas along dry and intermittent streams and sand deltas have *Pandanus* spp., *Melaleuca* spp., *Banksia dentata* and *Tristania lactiflua*, with pure stands of sedge *Leptocarpus spathaceus*. On protected coasts and tidal river mouths are mangrove forests of *Rhizophora mucronata*, *R. stylosa* and *Avicennia marina* var. *resinifera*, backed by salt flats.

NOTEWORTHY FAUNA

1 monotreme, 7 marsupials, 13 bats and 5 rodents; the relatively fewer species is probably due to lack of habitat diversity. Common mammals include fawn marsupial mouse *Anthechinus bellus*, agile wallaby *Protemnodon agilis agilis*, black flying fox *Pteropus alecto gouldii* and the hoary lobe-lipped bat *Calinolobus nigrogriseus rogersi*. 99 genera and 132 species of birds have been collected including those typical of coastal regions of the Northern Territory, especially waterfowl and the scrub fowl *Megapodius freycinet (reinwardt) tumulus*. Most of the amphibian and reptile species represented occur over wide areas elsewhere.

ZONING

The whole park is set aside for wildlife protection.

DISTURBANCES OR DEFICIENCIES

Introduced fauna, including Bali cattle *Bos javanicus* and Timor ponies *Equus caballus* have damaged part of the habitat but effect on native species is unknown. An airstrip has been constructed at Cape Don, the most westerly point, to facilitate access to the lighthouse.

TOURISM

Entry prohibited without a permit from Chief Inspector of Wildlife.

SCIENTIFIC RESEARCH

Systematic survey of fauna began in 1965 but periodic visits by naturalists date from 1840.

SPECIAL SCIENTIFIC FACILITIES

None within the reserve.

PRINCIPAL REFERENCE MATERIAL

C.S.I.R.O. DIVISION OF WILDLIFE RESEARCH, 1984. Faunal survey of the Port Essington District, Cobourg Peninsula, Northern Territory of Australia. *Technical Paper* No. 28.

SPECHT, R.L. 1958. The climate, geology, soils and plant ecology of the northern portion of Arnhem Land. In: *Records of the American-Australian Expedition to Arnhem Land-Botany and Plant Ecology*. 3: 333-414 Melbourne Univ. Press.

STAFF

1 full-time ranger.

BUDGET

The exact amount spent annually cannot be calculated at present but includes ranger's salary on AUS\$5,894 - 6,297 (US\$7,724 - 8,523) plus vehicle and accommodation. Total in 1971 was US\$16,100.

LOCAL PARK ADMINISTRATION

Department of the Northern Territory, Darwin N.T. 5790, Australia.

<u>NAME</u>	Innes National Park	
<u>TYPE</u>	National Park	<u>BIOTIC PROVINCE</u> 6.5.3
<u>LEGAL PROTECTION</u>	Total	
<u>DATE ESTABLISHED</u>	1970	

GEOGRAPHICAL LOCATION

Comprises the South-Western tip of Yorke Peninsula, South Australia: South 35°09' - 35°18'; East 136°48' - 136°58'.

ALTITUDE Sea level to 65 metres approximately.

AREA 9,141 ha.

LAND TENURE State Reserve

PHYSICAL FEATURES

The park encompasses both coastal and inland land systems. Landscape consists of cliffs, wave-cut platforms, rocky headlands, sandy beaches and coastal dunes, backed by relatively flat areas of calcareous sands over aeolianite. A chain of saline lakes stretches from Royston Head in the north-west to Rhino Head in the south-east. Average annual rainfall 450mm. Climate of hot, dry summers and mild, wet winters. Average summer maximum temperature 28°C; mean winter temperatures rarely fall below 10°C due to the close proximity of the sea.

VEGETATION

Five major vegetation types present in the park: Coastal Dunes, near the foreshore dominated by *Spinifex hirsutus* and *Isolepis nodosa*; further inland by *Olearia axillaris*, *Acacia longifolia* var *sophorae*, *Leucopogon parviflorus* and *Lepidosperma gladiatum*.

Coastal Heath, rarely more than 1m high, occurs on the coastal cliff-tops; *Lasiopetalum discolor*, *Leucopogon parviflorus* and various *Pultenaea* spp are common. *Acacia ligulata* and *Eucalyptus diversifolia* occur as emergents.

Further inland, the bulk of the park is covered with low Mallee Woodland. Heath plants form much of the understorey, but taller shrubs, *Melaleuca lanceolata* and *Templetonia retusa*, are prominent. *Eucalyptus diversifolia* forms a woodland fringe around the mixed mallee species of the park interior: *Eucalyptus diversifolia*, *E. rugosa*, *E. oleosa* and *E. foecunda* are found in quantity in the mixed mallee. As well, small grassy glades contain *Allocasuarina verticillata* and there are thickets of *Callitris canescens*.

Grasslands occur on the sand-on-limestone soils that bore the brunt of former agricultural activity and are now dominated by *Avena barbata* and *Lagurus ovatus*. Mallee regeneration is now taking place over much of the grasslands, with the pioneer species acacia anceps. The Salinas in the centre of the park are fringed with a salt march community of *Salicornia* spp and *Arthrocnemum* spp. These, in turn, are shielded by thickets of *Melaleuca halmaturorum*, sometimes with an understorey of *Gahnia trifida*.

Four endangered plant species have been recorded from the park.

NOTEWORTHY FAUNA

In addition to the more common denizens of mallee vegetation such as Western Grey Kangaroos (*Macropus fuliginosus*), Emus (*Dromaius*) and Malleefowl (*Leipoa ocellata*). Ospreys (*Pandion haliaetus*) nest along the coast. In all, over 100 bird species have been recorded from the park, in addition to a lesser number of reptiles and mammals.

ZONING

The management plan, adopted in 1982, divided the park into two major zones: the Natural Area zone along the coast provides for small areas to be developed for camping and day visitor use. Camping is prohibited in the remainder of the zone and vehicle access confined to designated tracks. The Limited Access zone, encompassing the interior of the park, only allows access on foot except for park management purposes.

DISTURBANCES OR DEFICIENCIES

Past grazing and gypsum mining activities have degraded parts of the park; these areas are regenerating naturally or being restored to a more natural condition. Some of the disturbed areas have weed invasion problems. There are some privately leased holiday cottages on the park and sport fishing takes place on the coast. There is some localised degradation due to intensive use of camping sites.

TOURISM

Park headquarters and a store are located in the reserve at Stenhouse Bay. A number of dwellings are leased for holiday accommodation. Estimated 7,000 campers in 1980; possibly an equal number of day visitors in addition to these. Road access is available to a number of historic and recreation areas. The park is popular for fishing and surfing.

SCIENTIFIC RESEARCH

Park staff monitor Western Grey Kangaroo numbers. The National Parks and Wildlife Service has issued scientific permits for research on the reserve that have included projects on sea lions, ants, honey eaters, beetles, ospreys, salt lake flora and fauna, reptiles, amphibians, arthropods, earthworms, vegetation, soils, coastal geology, visitors, birds and plant taxonomy.

SPECIAL SCIENTIFIC FACILITIES None.

PRINCIPAL REFERENCE MATERIAL

National Parks and Wildlife Service (1982) *Innes National Park - Management Plan* (Department of Environment and Planning: Adelaide).

STAFF: 3 rangers based at Stenhouse Bay in the park.

BUDGETLOCAL PARK ADMINISTRATION

Ranger-in-Charge
Innes National Park
Stenhouse Bay S.A. 5577.

NAME Simpson Desert Conservation Park

TYPE National Park BIOTIC PROVINCE 6.11.3

LEGAL PROTECTION

Not total because the *National Parks and Wildlife Act* 1972 - 1981 permits oil exploration operations, in lease areas that pre-date park proclamations, to continue.

DATE ESTABLISHED 1967

GEOGRAPHICAL LOCATION

Far north South Australia, adjoining Northern Territory and Queensland borders: South $26^{\circ}00' - 26^{\circ}30'$; East $137^{\circ}30'$.

ALTITUDE 2 to 45 metres approximately.

AREA 692,680 ha

LAND TENURE State Reserve

PHYSICAL FEATURES

The Simpson Desert is an extensive field of steep, high, parallel sand dunes, separated by flat interdune corridors. Clay pans and salt pans occur in low lying areas. The desert lies on the boundary between the northern (monsoonal) summer-rain zone and the southern winter-rain region; probably the major part of the average annual rainfall of less than 130mm falls in summer, although rainy days are few. The area experiences extended droughts, interspersed with periods of relatively high rainfall. Seasonal and diurnal temperature variations are marked; mean monthly maxima and minima range between 38°C and 22°C in January (summer) down to between 19°C and 6°C in July (winter).

VEGETATION

The sand dunes are dominated by a hummock grassland of *Zyghochloa paradoxa*, *Triodia basedowi* and *Aristida* spp. The interdune corridors are occupied by a low, open woodland of *Acacia aneura* and hummock grassland of *Triodia basedowi*, while a chenopod shrubland of *Arthrocnemum* spp. and *Pachycornia* sp. occurs on the clay pans. One rare plant species (*Calandrinia disperma*) has been recorded from the park.

NOTEWORTHY FAUNA

Over 150 bird species have been recorded from the park, including the rare Eyrean grasswren (*Amytornis goyderi*) and Australian Bustard (*Ardeotis australis*). Little is known about reptiles and mammals, although some species considered rare may still occur in the park, such as the Kultarr (*Antechinomys laniger*) and Greater Bilby (*Macrotis lagotis*).

ZONING

The draft management plan, released in 1984, divided the park into two major zones. A Natural Area zone is intended to eventually return the bulk of the park to wilderness after the cessation of oil search operations. No developments for visitors are to be permitted within the Natural Area zone. A Visitor Access zone is planned to provide visitor access corridors along the two major vehicle tracks through the park. The visitor access zone would contain developments of a simple nature such as signposting, route marking and provision of water. A third zone is planned to cater for small heritage areas, to protect any historical/archaeological sites that may be discovered in the future.

DISTURBANCES OR DEFICIENCIES

The presence of feral animals; rabbits, foxes, cats and Arabian camels detract from the pristine nature of the park. Rabbits, particularly, have had a severe impact on native vegetation. Oil search operations; seismic tracks, drill sites and other man-made access dating back several decades has degraded the wilderness qualities of the area, accelerated erosion and facilitated entry by visitors in 4WD vehicles to parts of the park that would otherwise be inaccessible.

TOURISM

Visitation is currently low but arid zone tourism is increasing. Estimated annual number of visitors (based on the three-year period 1978-1981) was 180; average number of vehicles per annum between 30 and 60. Commercial tours are few at this time but these operate regularly. Most visits to the park are made in the cooler months from May through October, the majority driving 4WD vehicles west to east along the main through-track. The National Parks and Wildlife Service does not maintain a permanent presence at the park.

SCIENTIFIC RESEARCH

The National Parks and Wildlife Service has issued scientific permits for research to be conducted on the park that has included projects on vegetation, rare animals, invertebrates, birds and palaeontology.

SPECIAL SCIENTIFIC FACILITIES

None.

PRINCIPAL REFERENCE MATERIAL

National Parks and Wildlife Service (1984) *Simpson Desert Conservation Park - Draft Management Plan* (Department of Environment and Planning; Adelaide).

STAFF

2 rangers based at Leigh Creek are responsible for this park as well as a number of other reserves in the far north of the state.

BUDGETLOCAL PARK ADMINISTRATION

Ranger-in-Charge
National Parks and Wildlife Service
LEIGH CREEK, S.A. 5731.

NAME Southwest National Park

TYPE National Park BIOTIC PROVINCE 6.5.5

LEGAL PROTECTION State Reserve under National Parks and Wildlife Act.

DATE ESTABLISHED 16 October 1968

GEOGRAPHICAL LOCATION

Within the Southwest Conservation Area, 154km from Hobart: S42°47'-43°33'; E145°57'-146°35'.

ALTITUDE: 442,240 ha

LAND TENURE State Reserve (Crown Land)

PHYSICAL FEATURES

A spectacular series of peaks known as Arthur Range runs approximately north-south in the centre of the Park. Also included are Federation Peak and most of the hydro-electric empoundment Lake Pedder. Extensive button grass plains, consisting mainly of poorly drained flat areas which remain wet for most of the year. On the south the park extends to the sea with attractive coastal scenery, the enclosed waters of Port Davey and Bathurst Harbour and offshore islands.

VEGETATION

A wide range of montane, coastal, wet heaths and fresh-water habitats. Closed forest of Antarctic beech *Nothofagus cunninghamii*, more open forest or woodland with *Eucalyptus obliqua*, *E. nitida*, *E. coccifera* and others, and sub-alpine woodland of *Athrotaxis selaginoides*. Closed lowland 'horizontal scrub' of *Anodopetalum biglandulosum* and closed and open alpine and sub-alpine heaths with the endemic *Richea* spp. Large areas of button grass *Gymnoschoenus sphaerocephalus* (a liliaceous plant) also true grasslands.

NOTEWORTHY FAUNA

Mammals can be assumed to include the Tasmanian devil *Sarcophilus harrisi*, the brush-tailed phalanger or possum *Trichosurus vulpecula fuliginosus*, wombat *Vombatus ursinus*, the endemic rufous bellied pademelon *Thylagale billardieri*, and the red-necked wallaby *Protemnodon rufogrisea*. There is still a possibility that the supposedly extinct Tasmanian tiger (thylacine) *Thylacinus cynocephalus* may survive here. A Red Data Book endangered species, the ground parrot *Pezoporus wallicus*, has been recorded from what are now flooded button grass plains surrounding Lake Pedder and might still occur in the Park. The Tasmanian mountain shrimp *Anaspides tasmaniae* is common in most of the highland lakes and tarns.

ZONING

A management plan is to be prepared. Most of the area is expected to be zoned wilderness.

DISTURBANCES OR DEFICIENCIES

Hydro-electric activities have caused major changes in the vicinity of Lake Pedder.

SCIENTIFIC RESEARCH

Sporadic investigations by graduates, naturalists and others.

SPECIAL SCIENTIFIC FACILITIES None.

PRINCIPAL REFERENCE MATERIAL

Chapman, J. (1983). Southwest Tasmania: a guide for the bushwalker.
Chapman, Melbourne.

Gee, H. and Senton J. (1978) The southwest book: a Tasmania Wilderness.
Australian Conservation Foundation, Melbourne.

Neilson, D. (1975). Southwest Tasmania - a land of the wild, Rigby,
Adelaide.

Waterman, P. ed. (1981). Southwest Tasmania resources survey: project
report, vol. one and two. Southwest Tasmania Resources Survey, Hobart.

STAFF

Two Rangers and 3 park assistants.

BUDGET

1983/84 Aus\$44,000.

LOCAL PARK ADMINISTRATION

Senior Ranger, Mount Field National Park, Tasmania 7456, Australia.

<u>NAME</u>	Cradle Mountain-Lake St. Clair National Park	
<u>TYPE</u>	National Park	<u>BIOTIC PROVINCE</u> 6.5.5
<u>LEGAL PROTECTION</u>	State Reserve Under National Parks and Wildlife Act.	
<u>DATE ESTABLISHED</u>	16 May 1922	
<u>GEOGRAPHICAL LOCATION</u>	West Central Tasmania: S41°35'-42°07'; E145°45'-146°15'.	
<u>ALTITUDE</u>	280-1,617 metres (mostly above 1,000 metres)	
<u>AREA</u>	131,290 ha	
<u>LAND TENURE</u>	State Reserve (Crown Land)	

PHYSICAL FEATURES

Western edge of the dolerite Central Plateau. Dominated by rugged dolerite-capped mountains including Mt. Ossa, 1,617m, the highest peak in Tasmania. The dolerite is of Jurassic age and overlies Permian and Tertiary sediments. The western part of the park is metamorphosed Precambrian quartzite. Virtually the whole area was glaciated during the Pliocene, resulting in the present landforms including cirques, U-shaped and hanging valleys, extensive ice-abraded surfaces and many glacial lakes. Rainfall varies from 1,500mm in the south to 3,000mm in the north.

VEGETATION

Extensive range of wet sclerophyll, temperate rainforest, montane and freshwater systems. About 27% of the park is occupied by montane grass and herb-fields including button grass *Gymnoschoenus sphaerocephalus*. Sclerophyll forest and eucalypt forest, with rainforest understorey, occupy 23% and 18% respectively and include *Eucalyptus nitida*, *E. obliqua* and *E. delegatensis*. *Nothofagus cunninghamii* rainforest occupies 12% of the area. Conifers include King William *Athrotaxis selaginoides* and pencil pine *A. copressoides*. Heathlands include *Richea* spp., and *Cyathodes* spp.

NOTEWORTHY FAUNA

Both the endemic echidna *Tachyglossus setosus* and platypus *Ornithorhynchus anatinus* are found throughout the park. At least 16 species of marsupials occur: brush-tailed possum *Trichosurus vulpecula fuliginosus*, wombat *Vombatus ursinus*, rufous-bellied pademelon *Thylogale billardieri* and red-necked wallaby *Protemnodon rufogrisea* are common; the Tasmanian devil *Sarcophilus harrisi* is present in low numbers; and the pygmy possum *Cercartetus nanus* and little pygmy possum *Eudromicia lepida* have been recorded. Very local but quite common where they occur are native cats *Dasyurus quoll* (*viverrinus*) and *Dasyurops maculatus*, barred and brown bandicoots (*Perameles gunni*) and *Thylacis* (*Isoodon*) *obesulus*, short-headed flying phalanger or sugar glider *Petaurus breviceps* and ringtail possum *Pseudocheirus convolutor*. Over 50 bird species listed. Two endemic frogs include *Litoria burrowsii* and *Ranidella tasmaniensis* and all three Tasmanian snakes have been recorded.

ZONING

Management Plan drafted and to be exhibited in 1985. Zones will be: visitation services, recreation, natural and wilderness (most of the area).

DISTURBANCES OR DEFICIENCIES

The level of Lake St. Clair is controlled for hydro-electric power generation.

TOURISM

The 85km Overland Track for bushwalkers crosses the reserve and is currently walked by 3,000 visitors. Park centres at Cradle Valley and Lake St. Clair with accommodation and campsites.

SCIENTIFIC RESEARCH None

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

McKelvry, M. (1976). *Cradle Country: a Tasmanian Wilderness*. Rigby, Adelaide.

Royal Society of Tasmania (1972). *The Lake Country of Tasmania. Proceedings of a symposium*, Hobart.

Siseman, J. and Chapman, J. (1984). *Cradle Mountain National Park*. Algona Publications, Melbourne.

Walker, R. (1964). *Peaks and high places*. Scenery Preservation Board, Hobart.

STAFF

Lake St. Clair	- 4 Rangers;
Cradle Mountain	- 4 Rangers;
Overland Track	- Ranger.

BUDGET

1983/84 \$AUS 275,200 including salaries.

LOCAL PARK ADMINISTRATION

The Ranger, Lake St. Clair, via Derwent Bridge, Tasmania 7465, and the Ranger, Cradle Mountain, Tasmania 7306, Australia.

NAME Yalgorup National Park
TYPE National Park BIOTIC PROVINCE 6.5.4

LEGAL PROTECTION

Not total since the Parks and Reserves Act 1895-1968 is subject to the Mining Act 1972.

DATE ESTABLISHED 26 January 1968 by Executive Council.

GEOGRAPHICAL LOCATION

South of Mandurah township in the south-west: S32°52'; E115°42'.

ALTITUDE

No information but presumably sea level to not more than 150 metres.

AREA

11,464 ha.

LAND TENURE

Class "A" reserve, Crown Land.

PHYSICAL FEATURES

Reserve of historic interest with old buildings remaining from the early days of the colony. Tuart forest country within easy access. Includes Lake Clifton, 19km long and 1.6km wide, which has practically fresh water and is near the old coast road, and Lake Preston which is 27km long by 1.6km wide and is very salty.

VEGETATION

Woodland with *Eucalyptus gomphocephala*, low closed forest with *E. rubis* and *Melaleuca* spp., closed scrub with *Acacia rostellifera*, *A. cyclops* and *cochlearis*, mixed coastal heath of Leguminosae and Myrtaceae and open heath, which is similar but has an admixture of Proteaceae (on limestone areas). Coastal vegetation with dune and swamp communities.

NOTEWORTHY FAUNA

Great diversity of birdlife with many waterfowl and black swans (*Cygnus atratus*).

ZONING

I-A, I-B, 95% conservation, 5% development.

DISTURBANCES OR DEFICIENCIES

None reported

TOURISM

Tourist potential

SCIENTIFIC RESEARCH

No information

SPECIAL SCIENTIFIC FACILITIES

No information

PRINCIPAL REFERENCE MATERIAL

None listed

STAFF

1 Ranger

BUDGET

1984/85 \$AUS 52,500 (including maintenance, wages and improvements).

LOCAL PARK ADMINISTRATION

Department of Conservation and Land Management, 50 Hayman Road, Como, WA 6153.

NAME Hammersley Range National Park

TYPE National Park BIOTIC PROVINCE 6.11.1

LEGAL PROTECTION
Not total since the Parks and Reserves Act 1895-1968 is subject to the Mining Act 1972.

DATE ESTABLISHED 31 October 1969 by Executive Council

GEOGRAPHICAL LOCATION
Hammersley range, north-western region: S22°55'; E118°09'

ALTITUDE Maximum 1,235 metres (Mount Bruce)

AREA 617,606 ha.

LAND TENURE Class "A" reserve, Crown land.

PHYSICAL FEATURES
Hammersley Range, with mountains, gorges, watercourses and plateaux. Mount Bruce is the highest point in Western Australia and Fortescue Falls and Circular Pool in Dales Gorge, Joffre Fall and Red Gorge are all scenically outstanding.

VEGETATION
Woodland with *Eucalyptus camaldulensis*, low-open woodland with *E. brevifolia* and *E. microtheca*, high open shrubland with mulga *Acacia aneura*, and hummocky grassland with *Triodea pungens* and *T. wiseana*.

NOTEWORTHY FAUNA
Varied and interesting including the echidna *Tachyglossus aculeatus*, the little northern dasyure or native cat *Satanellus hallucatus*, red kangaroo *Macropus rufus*, several species of bat including two species of tomb bat *Taphozous* and the lobe-lipped or wattled bat *Chalinolobus gouldii* and dingo *Canis dingo*. The avifauna is also of considerable interest and reptiles are common and varied.

ZONING I-B, 99% conservation, 1% development.

DISTURBANCES OR DEFICIENCIES None recorded.

TOURISM
Fortescue Falls and Circular Pool, Joffre Falls and Red Gorge are all tourist attractions, but few facilities have yet been developed.

SCIENTIFIC RESEARCH No information

SPECIAL SCIENTIFIC FACILITIES No information

PRINCIPAL REFERENCE MATERIAL
National Parks Authority (1983). A fauna survey of the Hammersley Range National Park, W.A. 1980. ed. B.G. Muir. Bulletin No. 1.

STAFF 1 resident ranger

BUDGET
1984/85 \$AUS 86,500 (including maintenance, wages and improvements).

LOCAL PARK ADMINISTRATION
Department of Conservation and Land Management, 50 Hayman Road, Como, WA 6153.

NAME Epping Forest National Park

TYPE National Park BIOTIC PROVINCE 6.5.1

LEGAL PROTECTION
Total, excepting "The Petroleum Acts 1923-1983"

DATE ESTABLISHED
1971 by Government Gazette (1971.3.482)

GEOGRAPHICAL LOCATION
About 139 km north-west of Clermont, central-eastern Queensland: S22°1'; E146°43'.

ALTITUDE 280 metres

AREA 2,663 ha

LAND TENURE State owned.

PHYSICAL FEATURES

Flat terrain with soil of loamy fine sand, reasonably friable, well drained with good holding properties. Soil type may be the critical factor in determining the suitability of the habitat for the hairy-nosed wombat.

VEGETATION

Mainly evergreen woodlands and open savanna woodlands with a winter ground cover of sparse dry grass and occasional herbs. Maximum tree height 15m. Common species include *Acacia excelsa*, *Bauhinia hookeri*, *Heterodendron oleifolium*, *Eucalyptus tessellata* and *E. terminalis*.

NOTEWORTHY FAUNA

The only area in Australia with a population of the Queensland hairy-nosed wombat *Lasiorchinus (Latifrons) barnardi*, A Red Data Book species now regarded as out of immediate danger, largely because of this reserve which was created for its protection. Because of its very restricted habitat which extends over no more than about 1,500ha of the reserve, it nevertheless rates as a very rare species.

ZONING None

DISTURBANCES AND DEFICIENCIES

Since last report this area has been destocked but some past disturbance is still evident. Occasional bushfires and small scale clearing continues in the vicinity of the National Park.

SCIENTIFIC RESEARCH

Population attributes and dynamics, movements and growth rate studies are in progress on the Queensland hairy-nosed wombat *Lasiorchinus (Latifrons) barnardi*. Habitat enhancement studies are also in progress in an attempt to increase numbers of this very rare and restricted species from the 30-40 extant individuals.

SPECIAL SCIENTIFIC FACILITIES

A mobile Laboratory and Accommodation unit is now in situ. This will accommodate 2 researchers.

PRINCIPAL REFERENCE MATERIAL

Goodwin, H.A., and Holloway, C.W. 1972 *Red Data Book* Vol. 1: Mammalia, 2.11.2.1

STAFF

One senior research officer 3/4 time, one ranger 3/4 time.

BUDGET

\$30,000 excluding salaries.

LOCAL PARK ADMINISTRATION:

Queensland National Parks and Wildlife
Service

P.O. Box 190,
North Quay, QLD 4000
Phone (07) 2240414

NAME Raine Island Fauna Refuge

TYPE National Park BIOTIC PROVINCE 6.7.1

LEGAL PROTECTION Total

DATE ESTABLISHED 9.21985 Government Gazette p.569

GEOGRAPHICAL LOCATION
120km east north-east of Cape Grenville. 11°36'S, 144°01'E.

ALTITUDE 0-7.3m.

AREA 27.3 ha

LAND TENURE

Crown reserve under trusteeship of the Under-Secretary of the Department of Community Services.

PHYSICAL FEATURES

Raine Island is a coral cay at the leeward end of a 210 ha oval patch reef off Great Detached Reef. The cay consists of bedded coral rubble consolidated by solution and redeposition of calcium carbonate above high water mark grading through to phosphatic limestone in the central plateau 1-2m above the beach. The plateau is bounded by small but significant cliffs encompassing a central depression. Sand dunes occur as a ridge along the eastern side of the cay.

VEGETATION

Thirteen species of grass, herbs and shrubs have been identified. No trees are present. Fauna has a marked influence on the distribution and abundance of these species over time. *Lepturus repens*, the dominant grass occurs on the outer sand areas. *Tribulus cistoides*, *Portulaca oleracea* and *Achyranthes aspera* are co-dominant herbs present on higher ground with *Abutilon asiaticum* the highest shrub present.

NOTEWORTHY FAUNA

This cay has the largest known Green Turtle, *Chelonia mydas*, rookery with records of 10,000+ being sighted per night. Furthermore, the area is a major breeding station for seabirds, and probably the most important in terms of numbers of species on the Great Barrier Reef. Breeding species include Brown and Masked boobies, Sooty terns, Wedge-tailed shearwaters as well as the Red-tailed tropic-bird, the Red-footed booby and the Lesser Frigatebird, otherwise considered rare on the Great Barrier Reef. Banded landrails and Rufous night herons also breed here.

ZONING

The cay has been zoned according to habitat and season, and a code of conduct has been published for visitors. Visitation is restricted by permit especially during critical breeding periods.

DISTURBANCES OR DEFICIENCIES

A beacon built in 1844 and manned last century and the impact of guano mining between 1890 and 1892 are evidence of European presence. No-one has lived on the cay this century.

SCIENTIFIC RESEARCH

Studies of the island's archaeology, vegetation, turtles and seabirds are in progress.

SPECIAL RESEARCH FACILITIES None.

PRINCIPAL REFERENCE MATERIAL

Stoddart, D.R., P.E. Gibbs, and D. Hopley 1981. Atoll Res. Bull. No. 254.

Raine Island Corporation Annual Reports, C/- Secretary, P.O. Box 190, North Quay, Queensland, 4000.

STAFF

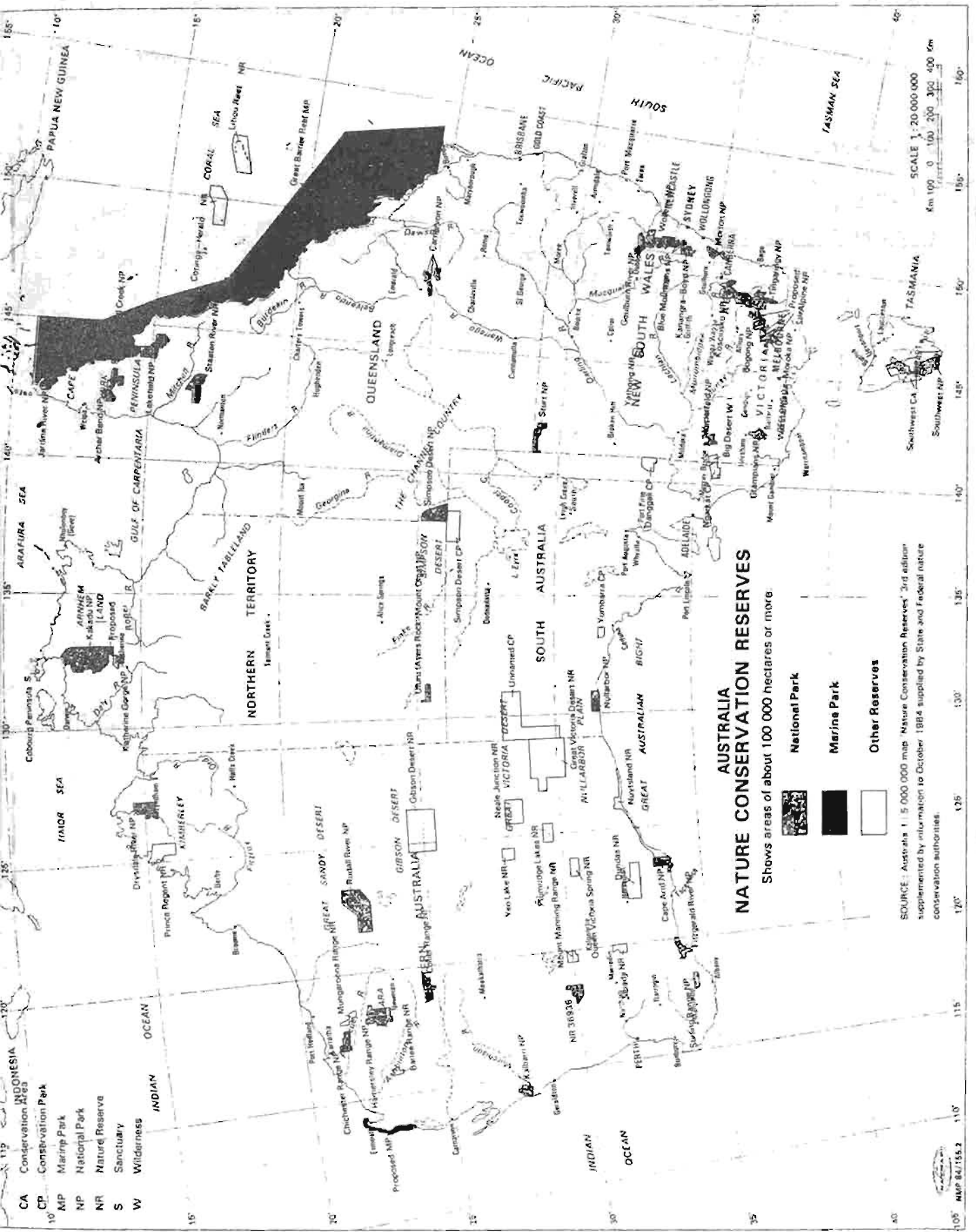
One Researcher and one assistant 3/4 time located at Townsville.

BUDGET

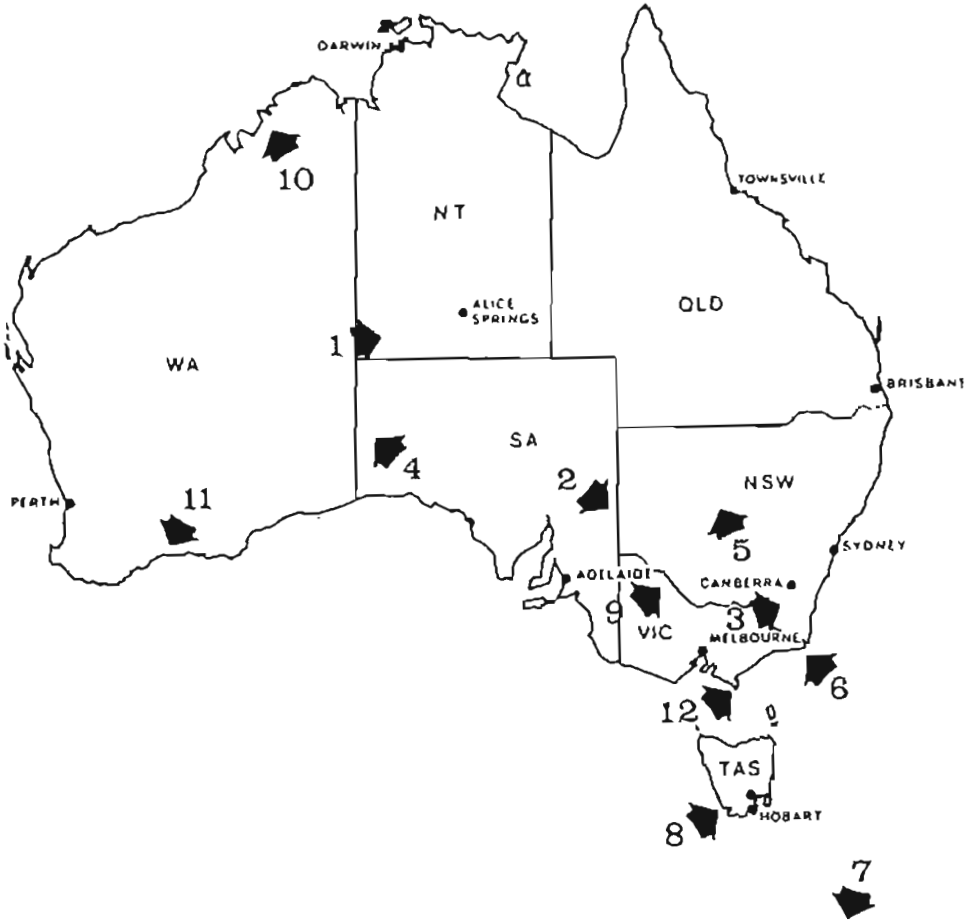
\$45,000

LOCAL PARK ADMINISTRATION

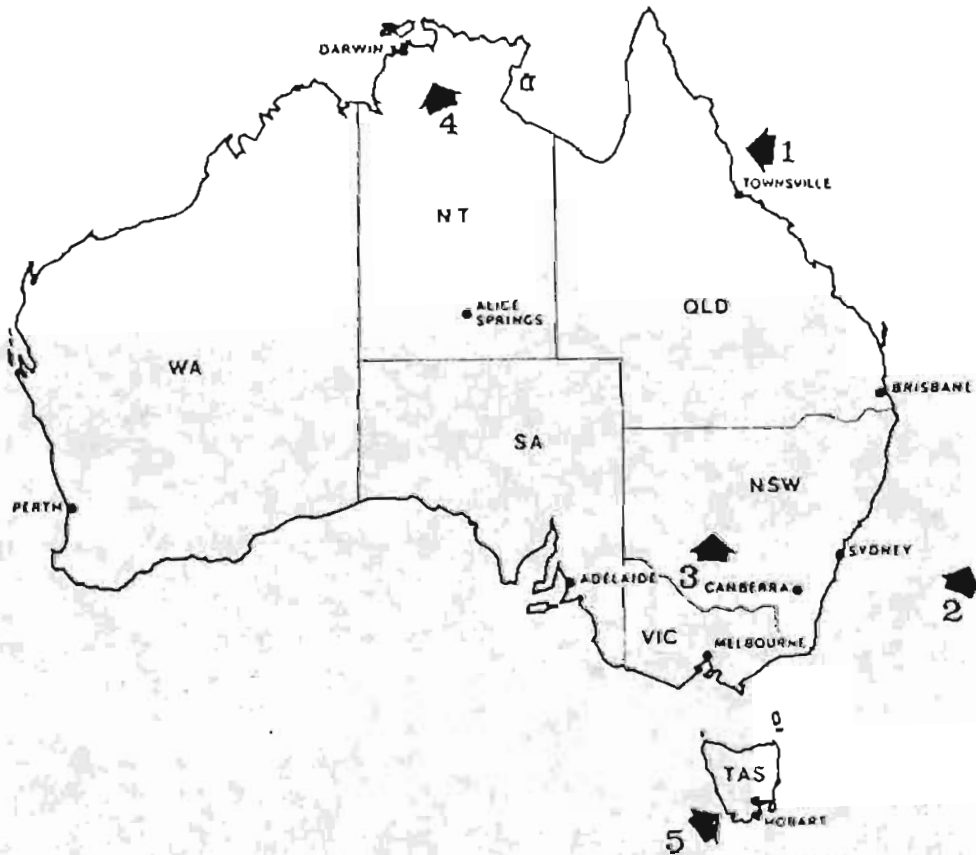
Queensland National Parks and Wildlife
Service,
Cairns,
Queensland.



Location of Australia's biosphere reserves



Location of Australia's World Heritage Properties



COOK ISLANDS

INTRODUCTION

The Cook Islands is a small South Pacific nation comprised of 15 small oceanic islands scattered over a very large area of the central South Pacific, defined by statute as "all the islands between 8° and 23°S latitude and 156° and 167° W longitude". (See Map 1).

Its territorial seas and Exclusive Economic Zone cover an area nearly 2 million sq.km (750,000 sq.miles) but it has only a total land area of about 240 sq.km (Maps of the Cook Islands Booklet 1983).

The total population of the group is 17,695 (1981 Census) of which one half (9,477) reside on the main island and the capital of the group, Rarotonga. The area of Rarotonga is 6,719 hectares.

The group is geographically divided into a Northern group which comprises coral atolls (low islands) and the Southern group which comprises mainly volcanic (high) islands except for Manuae which is an atoll and Tukutea which is a sand cay. With the exception of Suvarrow, Munuae and Takutea, all the islands are inhabited.

The average rainfall for Rarotonga is over 2,000mm per annum and rainfall for the other islands, ranges from the driest, (1,500mm), to the wettest, (2,800mm) per annum.

POLICY

The Land Court commenced investigation of customary land titles during the early part of this century, principally to allow European settlers to lease land for plantations. A surveyor/engineer-cum-postmaster, Mr H.M. Connal (1860-1920) came to Rarotonga in 1899 to commence title surveys. One of his earliest acts was to designate, at least on his land plans, all the interior mountainous area of Rarotonga as a water-catchment reserve, correctly assuming that good quality drinking water would be essential for a growing population and that it was best to restrict developments to the coastal plain. He also designated the island of Tukutea, 14km from Atiu, as a bird sanctuary. The island is owned by the people of Atiu and periodically visited for copra production. Both these areas, although marked on old maps as reserves, were unfortunately never legally set aside as such.

Ownership of the island of Suvarrow has never been claimed by any indigenous population of the Cook Islands, and it was resumed by the State and declared a National Park in 1978.

A small strip of land in the District of Avarua, Rarotonga (section 32) was established as a Timber Reserve in 1904 under a (New Zealand) Order-in-Council establishing the Cook Islands Titles Court. The Reserve served as a buffer zone from cyclones and wave surges protecting the investments in the commercial centre of Avarua.

In 1956 an area (section 34) adjacent to this strip was also declared as "access to public buildings" under section 356 of the Cook Islands Act 1915. However, a small area was later relinquished to allow the construction of public buildings and services.

Further along this coastal strip is section 206 which was taken in 1916 under the 1915 Principal Act, as a "burial of the dead" reserve. However, parts of this reserve were relinquished from the reserve because the government was under pressure to provide public lands for development.

Developments on this land, apart from public cemeteries, also include the Returned Services Association club rooms, two bulk fuel storage facilities (one for the airport and the other a general facility) and a laundry factory. The vacant areas remaining are fully utilised by the people of Rarotonga as recreation reserves.

In 1976 there were plans to offer the atoll of Manuae for a World Marine Park. Although the then government agreed to the reserve being established under the Conservation Act 1975, the land owners were not consulted, and they naturally objected with the result that the proposal fell through. In 1969 another area in the interior of Rarotonga covering approximately 2.6 square kilometres was proposed as a National Park or Reserve for the protection and conservation of endemic species of flora and fauna and approved by the Government. However, because of the tenure of lands, the acquisition of this area under the 1915 Principal Act did not eventuate.

Several attempts to create either national parks or recreation reserves have failed because of the land tenure system. Since 1978, no clear cut environment policy has been implemented. There was a period from 1978 to 1981 where the Government had only a broad brush environmental policy which dealt with sustainable utilisation of the natural resources of the Cook Islands. The present policies maintain this objective of sustainable resource use, and encourages baseline studies to complement management strategies and plans.

LAW

The Conservation Act 1975 is the principal Act established for the conservation of nature and natural resources, protection of historic sites and the environment and to set aside national parks and protected areas. It also creates the position of Director of Conservation to implement the Act.

Other legislation affecting environmental management includes the Local Government Act 1966; Land Use Act 1969; Building Control and Standards Act 1968; The Public Health Act and Ordinances; Harbour Control Act 1971; Cook Islands Act 1915 (sections 356, 357 taking and reserving land for public purposes, e.g. recreation reserves etc., Section 487, establishment of native reserves for the protection of historic sites or scenic interests, source of water supply, recreation grounds); the Trochus Act 1975 (regulates by licensing the harvesting of trochus within three Reserves); Territorial Sea and Exclusive Economic Zone Act 1977; Animal Act 1975; Health Act 1984; and Crimes Act 1969.

The Cook Islands is a signatory to the South Pacific Forum Fisheries Agency Convention; the Law of the Sea Convention; and is involved in the negotiations for the Convention for the Protection and Development of the Natural Resources and the Environment of the South Pacific Region, which has two Protocols, one on the Prevention of Pollution of the South Pacific Region by Dumping and the other on Co-operation in Combating Pollution Emergencies in the South Pacific Region. The Cook Islands is also a signatory to the South Pacific Nuclear Free Zone Treaty.

Traditional conservation practices are still practiced throughout the Cook Islands, more so in the Outer Islands than in Rarotonga. The "Rau" (prohibition) is applied by the traditional village leaders and enforced by the Island Council (Local Government) to preserve and restrict access to lands, lagoons and reef areas for the conservation of food, coconut and

marine resources. Traditionally, the objective of "Raui" is to allow the resource to recover, either for a special event, e.g. the opening of a meeting house or an expected influx of visitors, or to improve the yield of particular resource, e.g. copra, pearl shell etc.

ADMINISTRATION

The Conservation Act 1975 is administered by the Conservation Division of the Ministry of Internal Affairs and Conservation. The Director of Conservation is overall administrator and co-ordinator and has two technical staff as well as field officers responsible for beautification and sanitation.

The address of the Director is:

C/- Ministry of Internal Affairs and Conservation,
P.O. Box 98,
Rarotonga,
COOK ISLANDS

LIST OF PROTECTED AREAS

Suvarrow Island National Park was declared a National Park under the Conservation Act 1975 on 29 June 1978. It has a land area of 168 hectares and a lagoon area of 133 sq.km.

1. Suvarrow National Park is 950km from Rarotonga, 850km from Pago Pago, American Samoa and 1,500km from Papeete, Tahiti in French Polynesia. It meets the criteria of the IUCN (1978) category II, i.e. National Park (see Map 2).
2. Section 32 Avarua District on the Island of Rarotonga (Crown Land) was designated as a timber reserve and is now used as a recreation reserve (see Map 3).
3. Section 34 Avarua District on the Island of Rarotonga (Crown Land) was designated as access to public buildings, and is now used as a recreation reserve (see Map 3).
4. Section 206 Avarua District on the Island of Rarotonga, (Crown Land) was designated as a burial of the dead reserve. Part of it is now used as recreation reserve (see Map 3).
5. Parts of Sections 162, 171 and 175 Avarua District on the Island of Rarotonga (Crown Land) were designated Recreation Reserve (sports field).
6. Part of Section 10 Avarua District on the Island of Rarotonga (Crown Land) was designed as a reserve for township purposes, and is now used as a Recreation Reserve (sports).
7. Part of Section 107 Avarua District on the Island of Rarotonga (Crown Land) was designated as a reserve for a Wireless telegraph station. It is now also used as recreation reserve (golf course) and is one area of public land having two uses.
8. Part of Section 106C Avarua District on the Island of Rarotonga (Crown Lease) is now used as Recreation Reserve (sports field).

PROPOSED PROTECTED AREAS

1. There are several sports fields in the Cook Islands which are not designated as Public Recreation Reserves. These are all on privately owned lands, i.e. Native Freehold land.
2. The Island of Takutea is to be designated as a wildlife sanctuary as proposed in 1905 by H.M. Connal (see Map 4).
3. The Rarotonga water catchment and wildlife reserve. This will include all those areas on the Island of Rarotonga where the present water gallery and reservoir are installed and will protect the catchment for good drinking water at the same time protecting the wildlife in the proposed reserve.
4. Kakerori (Rarotonga Flycatcher - *Pamarea dimidiata*) Reserve. This will be a rare bird Sanctuary of approximately 10 sq.km in the interior mountainous area on the southern side of Rarotonga (see Map 5).
5. In 1969 Dr Phillipson of Canterbury University (New Zealand) proposed an endemic flora and fauna reserve of approximately 2.6 sq.km in the interior mountainous area of Rarotonga occupying the tops of the highest peaks and the ridges connecting these peaks. Note that proposals 3, 4 and 5 could be compatible and it may be possible to implement them under one comprehensive proposal.
6. Public areas now being used as Recreation Reserves but originally reserved for other public purposes may be re-designated in the future.

PROBLEMS, NEEDS AND PROSPECTS

There is a need to complete the base line studies of Suvarrow Island National Park so that a comprehensive management plan can be developed and implemented. There are plans to re-seed the lagoon with mother-of-pearl shell to re-introduce the pearling industry which used to flourish on the atoll. The atoll is a favourite illegal stop-over for yachties en route from Tahiti to Pago Pago. The threats posed by these visitors include the accidental introduction of pests, e.g. Rhinoceros coconut beetle and other diseases which could decimate the flora and fauna of the atoll and the danger of spreading these to other islands in the Cook Islands which are free of Rhinoceros beetle. Other threats include the accidental destruction of the Motus through careless use of fire; the exploitation of sea birds, coconut crabs and other attractive edible wildlife and illegal fishing along with the danger of fishing boats crashing on the reef.

There is a need to protect the endemic flora not only of Rarotonga but other threatened islands in the Cook Islands group.

There is also a need to protect the rare birds, e.g. Kakerori, Koputu, and the Rarotonga starling (ioi) and other threatened bird life in the Cook Islands. More research should be undertaken on the habitat, population and breeding habits of these species endangered and to identify areas which should be protected for their preservation.

PRINCIPAL REFERENCES AND MAPS

References

1. WILDER G.P. (1931) Flora of Rarotonga, *Bernice P. Bishop Museum Bulletin* 86 (Kraus Reprint 1971).
2. HOLYOAK D.T. (1980) *Guide to Cook Islands Birds*, Cook Islands Library and Museum Society (Inc.)

3. CROCOMBE R.G. (1964) *Land Tenure in the Cook Islands*, The Australian National University, Halstead Press Sydney (Reprinted 1969).
4. WOOD B.L. and HAY R.F. (1970) *Geology of the Cook Islands*, NZ *Geological Survey Bulletin* 82.

Maps

- (a) Maps of the Cook Islands booklet 1983. Published by the Survey Department Cook Islands Government.
- (b) Rarotonga Topographic Map Scale 1:15480 L & S 149 published by the Survey Department, Cook Islands Government, 3rd Edition 1982.
- (c) Navigation Chart NZ 225F 1979. Fiji to Tahiti showing the Territorial Sea and Exclusive Economic Zone of the Cook Islands. Published by the Hydrographic Office, Royal NZ Navy, Auckland.

PART 2: INFORMATION SHEETS ON PROTECTED AREAS

NAME Suvarrow Atoll National Park (see Map 2)

MANAGEMENT CATEGORY IUCN (1978) Category II National Park

LEGAL PROTECTION

Crown (State) Land declared a National Park under Section 11 (1) of the Conservation Act 1975. The Atoll is completely protected. However, visitors may enjoy the fishing and other resources for their immediate use but they cannot be commercially exploited. Licences could be issued for mother-of-pearl and trochus culture and harvesting and other limited economic uses such as copra production, the culling of coconut crabs (which have been reported as attacking the chicks and nests of sea birds), and the control of rats on Anchorage Islet.

DATE ESTABLISHED 29th June 1978.

GEOGRAPHICAL LOCATION

Suvarrow Island, its islets and its superjacent waters lie in the territorial sea of the Cook Islands at Latitude 13 degrees 14.7' south; longitude 163 degrees 06.3' west; 950km NNW of Rarotonga; or 850km ENE of Pago Pago, American Samoa; or 1,500km WNW of Tahiti, French Polynesia.

ALTITUDE About 2 - 4 metres above M.S.L.

AREA

Land area, 168 hectares. Lagoon area from the outer rim of the reef, 133 sq. km.

LAND TENURE

Crown (State) land; including the islets, lagoon bed and the sea bed to the territorial sea boundary.

PHYSICAL FEATURES

A typical coral atoll (low island), Suvarrow atoll is the top of an extinct submarine volcano rising from a depth of 3,000 metres on the S.W. rim of the Manihiki Plateau. The atoll has a continuous rim (0.5 - 1km wide) enclosing a 80m deep lagoon. [Stoddart, et. al. (1985)]. Buffeted by tropical cyclones for the last 100 years, much of the islets were severely changed during the 1942 hurricane to their present size, [Wood and Hay (1970)].

VEGETATION

A coconut plantation predominates on Anchorage Islet. Scrub species grow well and include: Ngangie (*Pemphis* and *Suriana*); Tahuhunu (*Cephor* - Yellow Fl. Pods) (hairy leaf); Ngau (*Utukava*) (*Scaevola*) (shiny leaf, white fruits); Ano (*Geuttarda*); (*Pandanus*); Vavai (possibly *Atiu tutu*); Maire (Fern); Tamanu (*Calophyllum*); Pia Maori (*Tacca*); Kaute (*Hibiscus*); Breadfruit (*Artocarpus*); Lemon tree (*Citrus*); Creepers, (Kaka) (*Ipomoea*); Poue (*Vigna Marina*).

NOTEWORTHY FAUNA

The islets of Suvarrow are "one of the most important seabird breeding areas in the Central Pacific certainly in terms of species diversity and in some cases in terms of numbers too". [Stoddart (1981)]. All the islets of Suvarrow Atoll notably Manu and Turtle, but with the exception of Anchorage islet, are breeding areas for a variety of seabirds, viz: Red Tail Bosun ("Tavake") *Phaethon rubricauda*; White Tern ("Kakaia") *Gygis alba*; Sooty Tern ("Tara") *Sterna fuscata*; Booby - Red-footed Booby ("Kena") *Sula sula*; Blue-faced Booby ("Kapu") *Salu dactylatra*; Brown Booby ("Toroa") *Sula*

Leucogaster; Brown noddy ("Ngoio") *Anous stolidus*; Black noddy ("Rakia") *Anous tenuirostris*; Frigate ("Kotaa") *Fregata Ariel*; and coconut crabs.

However, in 1981 an over-abundant population of Polynesian rat *Rattus rattus* ("Kiore toka"), was observed on Anchorage islet which may explain the low population of birdlife on that islet. The only birds observed roosting in the trees were the Brown Noddy *Anous stolidus* ("Ngoio") and Frigate birds *Fregata ariel*. Rats had been reported on Anchorage islet going back over a long period of time [Helm A.S. and W.H. Percival (1973)] and [Neale, T. (1966)]. The 1981 expedition to Suvarrow collected rat specimens to be identified in New Zealand by the Department of Scientific and Industrial Research (DSIR). So far the results have not been available and it is uncertain whether the species are the original Polynesian rat or cousins of the common Cook Islands variety. There is a danger of accidentally introducing the "Kiore toka" to other islets around the reef rim which is so far, free of this species. There was a report by the Captain of the G.M.V. Ravakai (the Cook Islands Government Fisheries vessel) that coconut crabs, "Unga Onu" were attacking nesting birds and their chicks on some of the islets and that there was a need to cull the population of this species.

CULTURAL HERITAGE

Suvarrow Atoll has a long history of being associated with adventure, from searches for buried treasure to a pearling industry. It was an important coal bunking station for the British Navy in the nineteenth century and in 1902 part of Anchorage Islet was reserved as a Reserve for Imperial Naval and Military Defence. During World War II (the Pacific War) Anchorage Islet was used as a coast watch and weather reporting station and radio operators manned the station from 1940 to 1950. The hermit Tom Neale lived on the island from 1952-54, 1960-64, 1967-69 and his successor, Michael Smith, from 1965 to 1966. Evidence of the coal bunker and the coast watcher's tower (tree house) and Tom Neale's house built on the original coast watcher's house site still exists but the house and water tank need repair. Illegal visitors such as yachties keep the fresh water tank clear of weeds and repair the catchment roof, and generally keep the house and grounds in reasonable condition. There is a notice erected by yachties requesting visitors to keep the place clean and to feed the remaining feral chickens (in 1981 4 hens, 1 rooster and 5 chickens *Gallus gallus* ("Moa") were observed).

LOCAL POPULATION

Nil (at present).

CONSERVATION MANAGEMENT

The National Park is under the joint control of the Conservation Service of Internal Affairs and Marine Resources (Fisheries).

ZONING

The area is zoned for limited use for pearl and Trochus culture and pelagic fishing (commercially) within the territorial sea boundary.

DISTURBANCES AND DEFICIENCIES

Although there is no resident Warden in the National Park at present due to financial constraints, it is planned to appoint one in the future. There is a real danger that noxious plants, insects, birds and other wildlife may be accidentally or deliberately introduced to Suvarrow Atoll or its islets by illegally visiting yachts and fishing vessels. This could threaten the flora and fauna of the Park as could the possibility of fire being started by unsupervised visitors. Other possibilities include the spreading of the rat population to other parts of the Park, the dispersal of introduced noxious insects, e.g. Rhinoceros beetle, to other parts of the Cook Islands, and also the possibility of clam fishing boats poaching on the rich clam beds of Suvarrow Reef and lagoon.

SCIENTIFIC RESEARCH

A joint New Zealand DSIR/Royal Society of London Northern Cook Islands cruise was undertaken in September 1981. The Expedition was "an integrated study of two twin island ecosystems, based on a complete and feasible coverage of the marine invertebrate and vertebrate biology and of the geological history, geomorphology and terrestrial vegetation of the atolls of Palmerston and Suvarrow which lie in a geographically-significant position in relation to "pangeneric contours" of coral and probably molluscan distribution across the Southern Central Pacific". It investigated a hypothesis of biogeographic gradients proposed by Wells and studied by Stoddard, Gibbs and Dawson. [Dawson E.W. (1981)]. Some of the results of this expedition were discussed at the 5th International Coral Reef Congress, June 1985 at Papeete, Tahiti and the full results of the Royal Society Expedition on Suvarrow will be published later in 1985.

A proposal is now under consideration to carry out some baseline lagoon productivity studies principally directed at the re-introduction of mother-of-pearl culture into the lagoon which was reported in 1981 as being completely denuded of pearl shell oysters. Suvarrow was once rich in mother-of-pearl oysters and supported a pearling industry in the last 100 years. This is a Fisheries project.

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIALMaps and Charts

- (a) Maps of the Cook Islands booklet 1983, published by the Survey Department, Cook Islands Government.
- (b) N.Z. Lands and Survey 1975 Aerial Plan 1036/8e, Suvarrow Atoll 2 sheets, scale 1:18,750 (approx.).

Air Photo Coverage

09 July 1974 1:50,400 (approx.) Royal New Zealand Air Force, coverage whole atoll including reefs.

Bibliography

- DAWSON E.W. (1981), NZOI/Royal Society of London Northern Cook Islands, Cruise 1981, Information Snippets No. 1, (unpublished) Int. Affairs file 15/08/13.
- GRANGE K.R. and SINGLETON R.J. (1985), A Guide to the Reef Fishers of Palmerston and Suvarrow Atolls, Cook Islands, Oceanographic Institute Field Report, DSIR, New Zealand.
- HELM A.S. and PERCIVAL W.H. (1973), *Sisters in the Sun, The Story of Suvarrow and Palmerston Atolls*. Robert Hale & Co. London, Whitcomb & Tombs Ltd, New Zealand 1973.
- HOLYOAK D. (1980), *Guide to Cook Islands Birds*, Cook Islands Library and Museum Society (Inc.).
- IRWIN J. (1985), The underwater Morphology at Palmerston and Suvarrow Atolls, Cook Islands, Oceanographic Institute Field Report, DSIR, New Zealand (in press).
- NEALE Tom (1966) *An Island to Oneself, The story of six years on a desert island*. Collins, London-Sydney, 1966.

SCOFFIN T.P. STODDART D.R., TUDHOPE A.W., WOODROFFE, C.D. (1985) Exposed limestone of Surwarrow Atoll, *Proceedings 5th Int. Coral Reef Congress*, Tahiti Vol. 2 p.348.

STODDART D.R. (1981), Letter to Conservation Officer, Department of Internal Affairs, Rarotonga, Cook Islands, File 15/08/13.

TUDHOPE, A.W., SCOFFIN T.P., STODDART D.R., WOODROFFE C.D., (1983), Sediments of Suwarrow Atoll, *Proceedings 5th Int. Coral Reef Congress*, Tahiti Vol. 2 p.383.

UNITED STATES NAVY DEPARTMENT (Hydrographic Office) (1933), Sailing Directions for the Pacific Islands, (Eastern Groups) Volume II.

WILDER G.P. (1931) Flora of Rarotonga. *Bernice P. Bishop Museum Bulletin* 86 (Kraus Reprint 1971).

WOOD B.L. and HAY R.F. (1970), The Geology of the Cook Islands (NZ DSIR) *NZ Geological Survey, Bulletin* No. 82.

STAFF

There is no resident Warden in the Park. It is controlled and under the jurisdiction of the staff of Ministry of Internal Affairs, Conservation Division and Ministry of Marine Resources (Fisheries) in Rarotonga, Cook Islands.

ANNUAL BUDGET

Nil.

LOCAL ADMINISTRATION

The Conservation Service Director and Secretary of Marine Services (Fisheries).

DETAILED MAP

Suwarrow Atoll (2 sheets) Scale 1:18,750 approximately.

FURTHER INFORMATION

Nil.

- NAME Rarotonga Recreation Reserve (see Map 3)
- MANAGEMENT CATEGORY IUCN (1978) Category II National Park
- LEGAL PROTECTION
Complete protection as a Park (Recreation Reserve) and prohibition of tree removal.
- DATE ESTABLISHED 1904, 1916, 1956
- GEOGRAPHICAL LOCATION
Foreshore of Avarua District, Rarotonga Island from the Avarua Harbour westerly along the foreshore through to the Catholic cemetery at Panama, South Latitude 21 degrees 12.1' West longitude 159 degrees 16.6'.
- ALTITUDE 2 - 5 metres.
- AREA 6 hectares
- LAND TENURE Crown (Public) Land
- PHYSICAL FEATURES
Public lands taken for foreshore (timber, public buildings and cemetery) reserve and bound by the Main Road - Ara Tapu on the inland boundary and by the Mean high water mark. Now extensively used for picnic area and other recreation activities consistent with national parks usage.
- VEGETATION
Trees are protected mainly Ngau (utu kava) *Scaerola*; Puka *Hernandia*; Ano *Geuttarda*; Toa *Casuarina*; Utu *Barringtonia*; Coconuts *Cocos*; Venevene *Coccoloba*; Purau *Hybiscus tiliacea*; Pukatea *Ceodes*; Tamanu *Calophyllum*; Creepers, Kaka *Impomoea*; Poue *Vigna marina*. It is well grassed and lawned, seats and picnic facilities provided. More tree shelter is being planted by the Conservation Service.
- NOTEWORTHY FAUNA
Sea Birds (very occasional) - Indian Mynah *Acridotheres tristis*; Kuriri (Wandering tattler) *Heteroscelus incanus*; Kotuku (Reef Heron) *Egretta sacra*.
- CULTURAL HERITAGE
Nil, but near landings of ancient Polynesian voyaging canoes, e.g. Uritaua's Marae at Aretere, Avatiu and Karika's Marae at Tuituikamoana at Avarua.
- LOCAL POPULATION
No one lives in the reserve but used every day by the population of the island.
- CONSERVATION MANAGEMENT
The reserve is under the control of the Conservation Division of the Ministry of Internal Affairs and Conservation.
- ZONING
Limited to Recreation use only.
- DISTURBANCES AND DEFICIENCIES
Nil, however Government may be under pressure to give parts of the reserve up for commercial activities. Parts of this foreshore reserve have already been given up for bulk fuel storage, public buildings, etc.

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIAL

- (a) Rarotonga Topographic map. Scale 1:15,840, L & S 149 published by the Survey Department, Rarotonga, Cook Islands.
- (b) Rarotonga Block Sheets 2 and 3, Survey Department, Rarotonga.
- (c) WILDER, G.P. (1931) Flora of Rarotonga, *Bernice P. Bishop Museum Bulletin 86* (Krause Reprint 1971).
- (d) HOLYOAK, D.T. (1980) *Guide to Cook Islands Birds*, Cook Islands Library and Museum Society.

STAFF

Under the direction of Conservation Division, Ministry of Internal Affairs and Conservation.

ANNUAL BUDGET

Annual appropriation under the beautification programme of the Ministry of Internal Affairs and Conservation.

LOCAL ADMINISTRATION

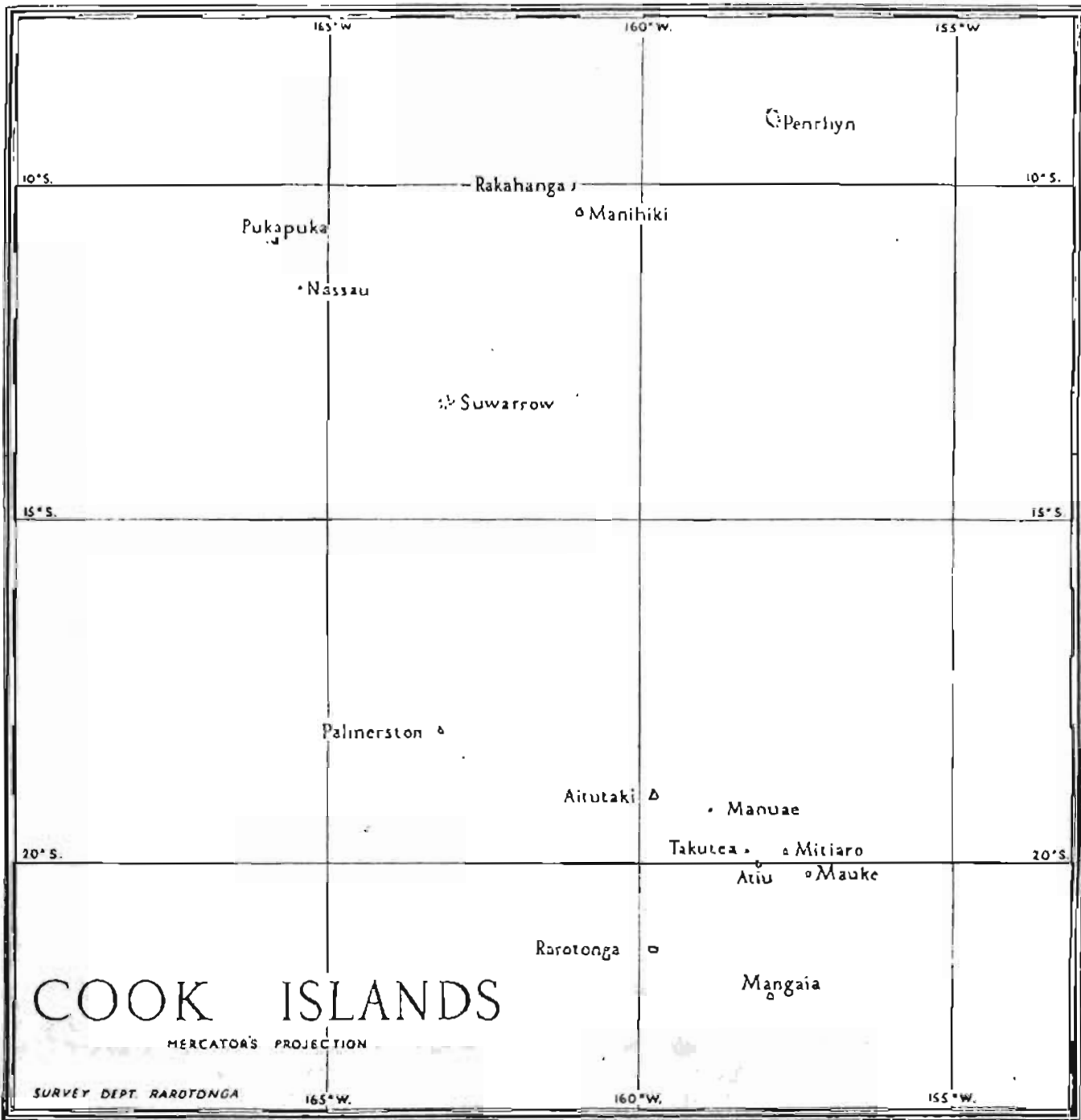
Director of Conservation and his staff.

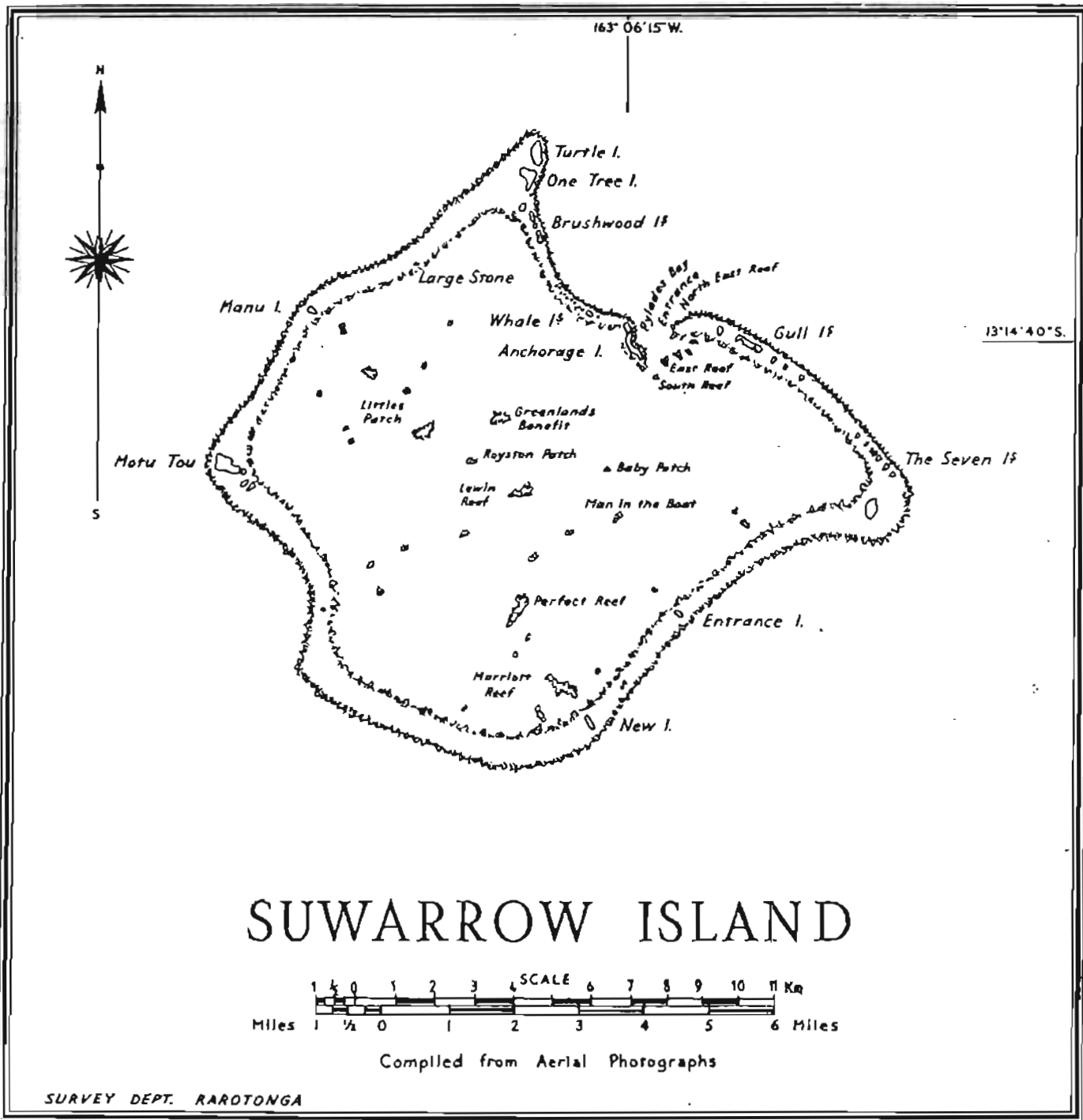
DETAILED MAP

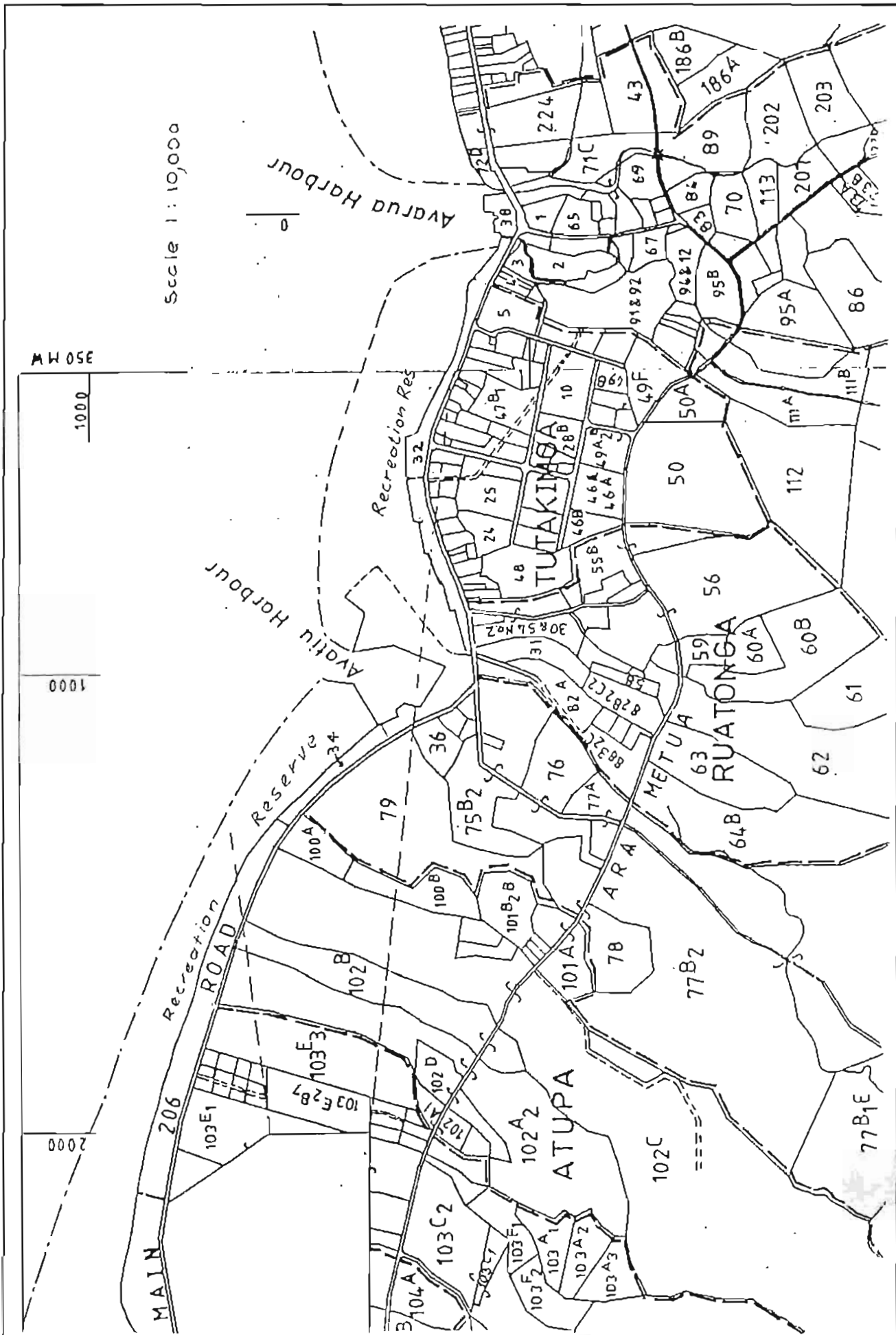
Attached.

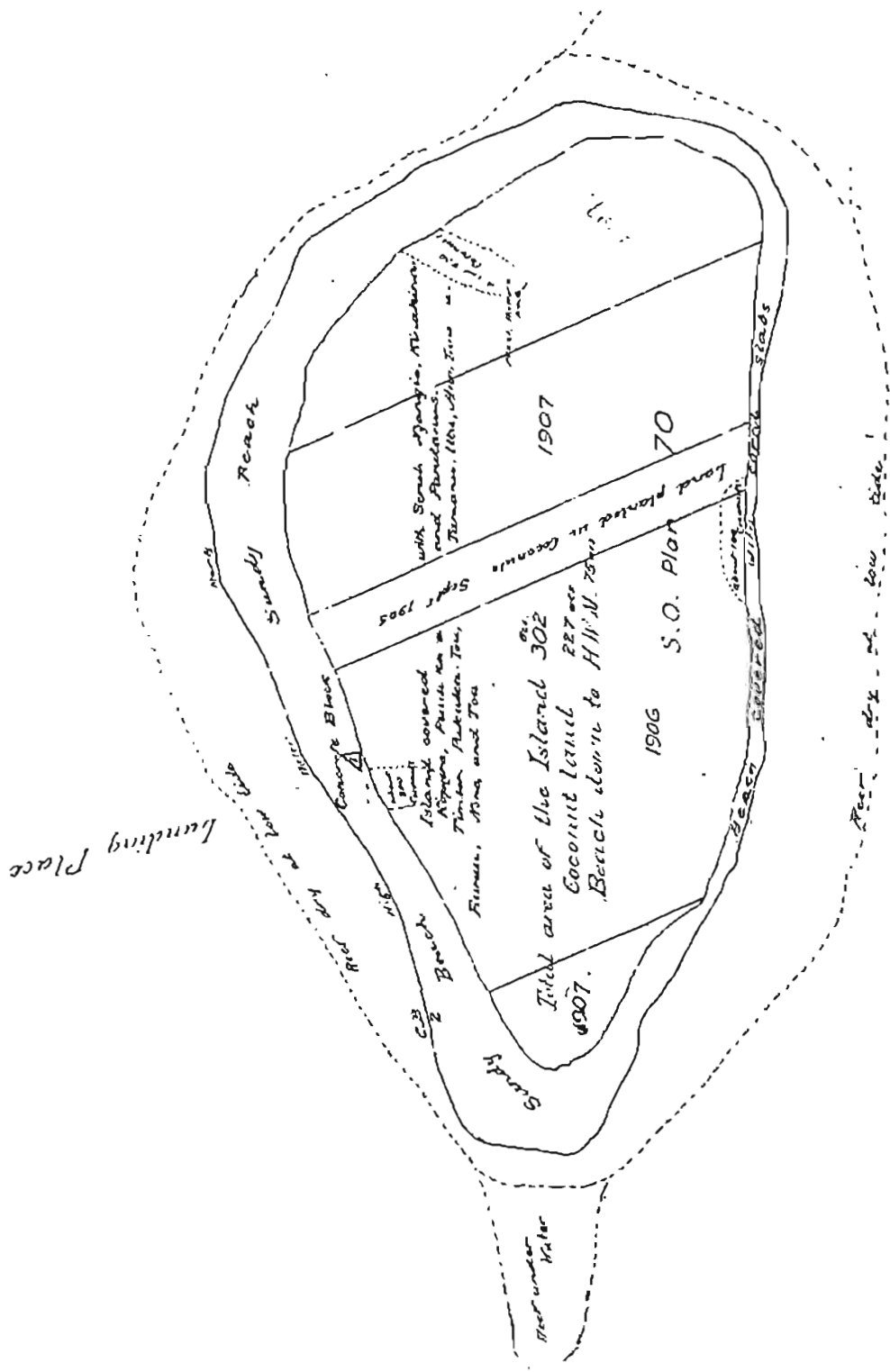
FURTHER INFORMATION

Nil.









Island of Takutea



Customary N. L. Sec 10 Res & Other Lands Disposal Act 1937
 Freehold Order 15/2/1950 Vested in Natives of ATIU



RAROTONGA ISLAND



SURVEY DEPT. RAROTONGA

FIJI

PART I - GENERAL REPORT

INTRODUCTION

Situated in the South West Pacific and in the path of the prevailing south-east trade winds, the Fiji Islands are endowed with a geographically and biologically diverse nature. Fiji is an archipelago comprising over 300 islands which range from a half hectare in size to over 100,000 ha.

Fiji has a tropical marine climate which is largely influenced by the presence of mountain ranges on the larger islands resulting in a wet windward south east and a dry leeward northwest-east region on these islands.

The islands in the Fiji group may be classified as either "high" or "low". The former may be further divided into ancient, or at one time having continental connection, or more recent islands; both are volcanic. Some of the low islands are formed of volcanic material but others are made of limestone (sometimes they are raised reef platforms). The low island group also include composites of volcanic and limestone material.

The interiors of the larger islands are extremely rugged with peaks rising over 1,200 metres on Viti Levu and Taveuni and over 900 metres on Vanua Levu. The main areas suitable for settlement and agriculture are the coastal plains and river valleys of the larger islands. It is estimated that seventeen per cent of the land is flat or gently undulating, another seventeen per cent rolling hills, while the remainder is steep. In many places steep hillsides come down close to the shore line. These areas may either lack beaches or they are of poor quality. Others may be fronted by fringing coral reefs exposed at low tides. However, Fiji has many fine sandy beaches scattered throughout the island group.

Although larger islands are usually well-watered with many permanent rivers and streams, many of the smaller islands are lacking sufficient ground water supplies, and residents are dependant upon catching and storing rainwater. There are few fresh water lakes in Fiji, and those that do exist are small and generally limited to mountainous region. Recently two man-made lakes were commissioned for power generation and water supply.

The oceanic waters of Fiji contain one of the most complex reef systems in the world. Almost every type of reef structure (fringing, barrier, atoll, etc) is represented in pristine or near pristine condition. Of particular note are the two atolls located in Fiji waters: Qelelevu and Wailagilala.

The Fiji islands are heavily vegetated in some places. A distinctive feature is the sharp contrast in vegetation between the wet, densely forested south-east regions, the dry grasslands or "talasiga" lands of the west and the scattered forests in the north west of the two larger islands. About fifty per cent of Fiji is forested, mostly in natural forests, although much of the "talasiga" lands have been planted in pines. Many sections of the islands' shorelines are fringed with mangrove communities. On the smaller islands the vegetation varies from the rainforests of Kadavu and Taveuni to the near barren grass covered slopes of the Yasawa island group. In contrast to the remaining natural vegetation and planted forests, distinctive landscape features are the many cane and rice fields and large coconut estates.

Large land animals are not native to Fiji however, several interesting reptiles, amphibians and mammals are present. Endemic species include two Fiji frogs, the Fijian snake, a crested iguana and the monkey-faced fruit bat. Large numbers of land, shore and sea birds inhabit the islands, some quite rare and endemic. The coral reefs provide habitat for an abundant and extremely diverse population of fish and other marine life. Humpback and reportedly, sperm whales are found in Fiji waters during their calving season from May to August. Turtles present include the Green and Hawksbill species.

Fresh water fauna has not yet been studied to any extent. It is comprised mainly of crustaceans, molluscs and fish including eels.

In mid-1984 the total population of Fiji was estimated to be 685,725 made up of native Fijians, Indians, Chinese, Europeans and other Pacific Islanders. The 1976 census figure was 588,068. Although thirty-seven per cent of the population is classified as urban, sixty-four per cent actually reside in or within five miles of urban centres. The historical population drift from rural to urban areas has been increasing over the years.

POLICY

The Governmental Policy and programmes are guided by five year Development Plans.

The following quotes are from Development Plan Eight (Volume 1) and relate to natural resource conservation:-

"12.5.05 - In DP7 there were a number of objectives to protect and conserve important features of Fiji's unique environment. The overall aim was to exploit Fiji's natural resources wisely, in a manner consistent with the maintenance of a healthy environment. Specifically, Government intended to promote public access to beaches, to develop national and regional parks for recreation and study, to restrict excessive noise pollution, and to ensure that major resource based development projects were permitted only in the context of strict environmental safeguards.

12.5.06 - Progress in these areas has been varied. The National Trust for Fiji was established in 1970 but its operations have been hampered by limitations on resources and trained staff. The DP7 policy and objectives shall remain unchanged during the DP8 period."

One of the three main areas of government concern in this policy can be identified as:-

"12.5.10 - (c) The development of a system of environmental protection, incorporating national parks and reserves, to protect areas of outstanding natural beauty or unique or rare ecosystems and to provide local people with open spaces for recreation."

The above concern was then translated into a programme as quoted below from DP8:-

"The main objective of this programme is to establish a system of regional and national parks in Fiji which will serve a dual purpose; first the provision of managed outdoor recreation facilities for the local population and second, the conservation of areas of outstanding beauty or special scientific (botanical or marine) interest. During the Plan period the Government will enact a National Parks and Reserves Act which will effectively provide for the preservation and protection of the natural environment including unspoilt landscape,

reefs and waters, indigenous flora and fauna, habitats and ecological systems, features of scenic, historic or archaeological interest or other scientific interest. In addition, the bill would allow use of the parks by the public for enjoyment, recreation and educational purposes.

12.5.24 - Other legal areas that will be examined are the 1974 Income Tax Act to provide tax relief for donors of gifts or real property to the National Trust for parks or reserves and the Electricity Ordinance to expand the duties of the FEA to include both the development of the multi-use potential of hydro-power schemes and the preparation of environmental impact reports necessitating Government approval prior to any future power development scheme.

12.5.25 - National Parks and Reserves need to be established in a manner which avoids conflict with agricultural schemes, forestry projects and other development schemes. Government will protect unique species of mangroves, especially those in danger of extinction, through the creation of coastal marine reserves, and the incorporation of mangrove areas into coastal parks where necessary."

Priority will be given to parks and reserves near existing urban areas where both pressure for development and recreation demand is heaviest.

Criteria for the selection of priority projects to be identified early in DP8 will include the distance from large concentrations of population, the threat of destruction or despoliation of the environment, extent of present usage and the pressure of development from other sources. A list of priorities will be prepared embodying the following strategies:

- (a) to establish the maximum possible number of protected areas at minimum cost by leasing Crown Lands, and negotiating for rights with native landowners who are willing to consider compensation in the form of economic benefits (employment, income etc), rather than outright cash payments; and
- (b) to concentrate the major programme initially on Viti Levu where the future implications of socio-economic development indicate the greatest pressure will be brought to bear on Fiji's natural environment and where the need for outdoor recreation is greatest.

The National Trust for Fiji

The National Trust for Fiji has a responsibility to preserve, protect and manage elements of Fiji's archaeological, environmental and scientific heritage. In order for the Trust to effectively discharge its functions, it requires an annual grant. The Trust's goal is to promote the permanent preservation of lands (including reefs), buildings and other items having national, historic, architectural or natural interest. This embraces areas of outstanding beauty, unique or threatened animals and plants, buildings, archaeological sites and places of special scientific interest. The Trust would be the main implementing agency of the National Parks and Reserves Bill discussed earlier. Consequently, an annual budget allocation to cover operating and capital expenditures of \$90,000* is made. This will enable the Trust to effectively discharge its responsibilities with respect to the conservation and protection of the environment, both for recreation and for study.

* To date Trust's actual allocation is only \$45,000.

CONSERVATION LEGISLATION

Laws that specifically deal with conservation include the following:

- (a) National Trust for Fiji Act (Chapter 265) providing for the permanent preservation of lands (including reefs) for the benefit of the nation; the protection and augmentation of such lands and their surroundings and to preserve their natural aspect and features; to protect animal and plant life; and to provide for the access to and enjoyment by the public of such lands.
- (b) Town Planning Act (Chapter 109) providing for the preparation of Town Planning Schemes including the conservation of natural beauties of the area including lakes, banks of rivers, foreshore or harbours and other parts of the sea, hill slopes, summits and valleys.
- (c) Native Land Trust Act (Chapter 115) with provision to proclaim nature reserves over any part of native land.
- (d) Land Conservation Act (Chapter 120) with provisions to appoint Land Conservation Officers.
- (e) Birds and Game Protection Act (Chapter 120).

- The following laws have built-in conservation provisions:

- (f) Fisheries Act (Chapter 135) with provisions to control fishing methods.
- (g) Mining Act (Chapter 125) with provisions to conduct environmental impact assessments and to restore the mined out areas.
- (h) Forestry Act (Chapter 128) with provisions to declare land as protected forest.

- Legislation that has been drafted or proposed and awaits enactment includes the following:

- (i) National Parks and Reserves Bill proposed by the National Trust for Fiji.
- (j) A new Town and Country Planning Act.

- There are still gaps to be filled and these include:

- (k) The protection of endangered, rare, endemic species of plant and animal.
- (l) The conservation of critical marine habitats.

PARKS AND RESERVES ADMINISTRATION

The use of Fiji's natural resources is guided by a strong central government which makes most of the decisions concerning the allocation of funds and where planning is centralised. National development plans cover 5-year periods setting forth Government's goals and objectives and the policies and programmes designed to achieve social and economic progress.

Below the national level Fiji has a system of divisional and local government. The country is divided into four divisions for administrative purposes. These divisions are comprised of provinces which in turn are made up of districts. Through their councils and committees the provinces and

districts largely determine how Government grants and other funds are spent on local development schemes.

City and town councils are the main governmental bodies in a well-developed local urban system. They are assisted by the government through grants and loans and technical and town planning services. In addition there are "local authorities" for rural areas which are primarily concerned with matters of public health.

The following is a review of the objectives, functions and programmes of government agencies, statutory authorities, and other institutions which are most concerned with the planning and use of Fiji's natural resources, or have particular relevance to the establishment of a national parks and reserves system.

The Central Planning Office in the Ministry of Economic Planning and Development is responsible for the preparation of the national development plans. It also co-ordinates development schemes as well as recommending major development projects for approval.

The Ministry of Housing and and Urban Affairs and its Directorate of Town and Country Planning have powers of approval over housing, subdivision and other development projects. Town and Country Planning requires a thirty metre set-back from mean high water mark for any development fronting on the ocean shore line, a provision for public access, and a minimum of five per cent of the total area of any subdivision to be set aside as open space or for public recreational purposes. The Directorate also undertakes sub-regional planning studies which include the identification of areas suitable for parks and reserves. The Directorate is also the Secretariat for an inter-departmental committee on environmental matters known as the Environmental Management Committee.

The Ministry of Fijian Affairs has responsibility for the Native Lands and Fisheries Commission and the Native Lands Trust Board. The Native Lands and Fisheries Commission decides on boundary disputes and claims concerning land and fishing rights and maintains a register of ownership. The Native Lands Trust Board administers all native communally-owned lands on behalf of the owners including the use and disposal of lease rights.

The Ministry of Lands, Mineral Resources and Energy administers, through its Lands and Survey sections, all Crown (Government) lands. The Department leases Crown Lands and foreshore areas for development purposes, and acquires land for various public purposes, as well as managing some as recreational areas, e.g. Nukulau Island. The Ministry's Department of Mineral Resources undertakes studies of the geological and geophysical nature of the country. It issues permits for exploration and development of mineral resources and explorations of the seabed for oil. The Ministry of Energy is responsible for the planning and policy formulation required to meet the energy needs of the country including water impoundment for hydro electric developments.

The tourism section of the Ministry of Foreign Affairs, Tourism and Civil Aviation has a programme for developing beaches, scenic resorts, and other natural attractions to meet a growing domestic and foreign tourist demand. This helps to achieve several of government's tourism objectives by:

- 1) spreading the benefits of tourism to a wider geographical area to promote rural development, and
- 2) increasing the number and length of stay of foreign visitors.

The Ministry of Primary Industries has legislative and enforcement powers for protecting bird-life. It issues licences for taking or killing game birds and has powers to ban hunting. The Ministry also issues permits for the export of wild animals. The Fisheries Division issues licences for commercial fishing and conducts studies of marine resources to guide management in order to avoid over-exploitation. It has established regulations to govern the size of different species of fish and other marine life that can be caught and utilised.

The Ministry of Forests has programmes to protect and develop the natural vegetation, to increase production from indigenous forests, and to provide and preserve amenity areas. The Ministry also administers eight nature reserves established under the Forestry Act. The Ministry issues licences for timber harvesting including the cutting of mangroves. The Fiji Pine Commission is implementing a Pine Scheme Programme of planting trees mostly on "talasiga" lands which were at one time covered with natural vegetation but have been cut and burnt repeatedly. The resulting bare ground is slowly being revegetated by smaller plants, mostly wire and mission grasses. Like the Ministry of Forests, the Pine Commission has a policy of providing amenity areas.

The National Trust of Fiji, a statutory body created in 1970 under the Ministry of Housing and Urban Affairs, is the only institution in Fiji which has broad legal responsibility of conserving the country's natural heritage. The Trust at present administers an animal sanctuary and a reserve. The statutory responsibilities of the Trust are carried out by a Council consisting of ten members including a Chairman and a Vice-Chairman, all appointed by the Minister for a period not exceeding two years. The work of the Trust is carried out at present by a Conservation Officer, an Education Officer and a Clerk/Typist. Inputs are sought from Trust Council members and other persons who possess expert knowledge on these matters.

ADDRESSES

- (a) The National Trust for Fiji
P.O. Box 2089
Government Buildings
SUVA
- (b) The Ministry of Forests
Private Mail Bag
Government Buildings
SUVA

LIST OF PROTECTED AREAS

1. Ravilevu Nature Reserve
2. Tomanivi Nature Reserve
3. J.H. Garrick Memorial Forest Reserve
4. Naqaranibulutí Nature Reserve
5. Nadarivatu Nature Reserve
6. Yadua Taba Crested Iguana Sanctuary
7. Draunibota Nature Reserve
8. Vuo Nature Reserve
9. Labiko Nature Reserve

All the above fall into IUCN category: IV - Managed Nature Reserves/Wild-life Sanctuaries.

All the above are on Crown land except 3, which is on freehold land and 6, which is on native land.

PROPOSED PROTECTED AREAS

In 1980 a plan for a National Parks and Reserves System for Fiji was completed. This plan was the result of a project initiated by the National Trust for Fiji in co-operation with the International Union for Conservation of Nature and Natural Resources and the World Wildlife Fund. The publication of this document was undertaken with support from United Nations Environment Programme and the World Wildlife Fund.

This Plan is awaiting the completion of draft legislation for the establishment and management of National Parks and Reserves in Fiji. Once the legislation is approved and passed by Parliament the Plan can be implemented. The Plan provides for the present nature reserves under the Ministry of Forests to form the nucleus of the Parks and Reserves System and also provides that a further sixty-four areas be investigated, and if appropriate, be incorporated in the proposed protected area system.

The Plan also has an annex which contains management plans for two areas, one of which was to form the pilot project as Fiji's first national park. It is now felt that the recently acquired J.H. Garrick Memorial Reserve should be developed into this country's first National Park.

PROBLEMS, NEEDS AND PROSPECTS

(a) Ecodevelopment:

The establishment of a national parks and reserves system provides many opportunities to apply, in a practical way, the concepts of ecodevelopment by:

- i) Recognising the strong relationship between the people of Fiji and their lands and waters ("Vanua"), and encouraging the customary owners of parks and reserves to continue the traditional way of life by using areas in a manner so as to retain and further develop the cultures of Fiji.
- ii) Selecting areas where there is evidence of Fiji's cultural heritage that can be protected and preserved.
- iii) Incorporating participation by landowners and other members of the local community into the planning and management process.
- iv) Developing parks for public use in a way that is sensitive to the need to preserve; restore or enhance plant and animal life.

(b) Land Tenure

The extent of communally owned native lands is such that they contain most of the areas which should be included within the national parks and reserves system. Some consideration when acquiring rights to these lands are:-

- i) If alternative areas of low economic value or potential are available they should be selected. This will increase the likelihood of acquiring, at the lowest cost, the necessary rights which may be in form of restrictions on the use of natural resources or privileges granted for public access, use or development for recreational, educational or similar purposes.
- ii) In negotiations preference should be given to mataqualis who are:

1. aware of the need for good conservation practices,
2. receptive to the parks and reserves concept,
3. believe the establishment of parks or reserves can assist them to make use of the land according to their wishes or support retention of their local customs, knowledge and traditions, or
4. willing to consider indirect compensation in lieu of cash rental payments.

Although the National Trust has not been very successful in leasing Crown Lands, these lands should be the easiest to obtain and at the least cost.

Since the purchase of freehold land will become increasingly costly, the following alternatives should be employed whenever feasible:

- (1) Obtain funds for purchase in the form of grants from funding sources (internally/externally).
- (2) Encourage public spirited individuals and corporate bodies to make gifts of real property by providing an incentive in the form of tax relief.
- (3) Initiate a "voluntary land dedication" programme. This involves obtaining a pro forma agreement from a landowner that he will manage the property according to the management objectives of the park administering authority. No rights are conveyed and the agreement can be abrogated by either party unilaterally. The landowner receives recognition by having his property designated a part of the National Parks and Reserves system and receives a metal plaque for display and a certificate.

(c) Traditional Fishing Rights:

The future implications of traditional fishing rights cannot be fully assessed at this time because they are under review. Because the purpose of establishing marine parks and reserves is to protect the marine life inhabiting these areas, it can be concluded that any subsistence or commercial fishing by "rights" holders would have to be managed at a sustainable level. Fishing by traditional methods, or those currently in use, is not expected to be a problem in most situations and therefore could continue. However, the use of higher technology in the future could increase fishing efficiency to the extent where imbalances in the populations of some marine species through over-exploitation occurs. In either event, where it is determined that over-exploitation is occurring, fishing or harvesting of non-fishery marine life would have to be regulated either by enforcement of applicable laws by the Fisheries Division or other appropriate government agencies, or by the regulations of the parks authority. Compensation may become an important consideration in the conservation of marine species.

As in the case of acquiring land rights, it is concluded that the greatest chance of success in establishing and maintaining marine parks and reserves is by reaching agreement with holders of communal fishing rights who are, or can be made aware of, the long term benefits of proper management of the marine life. Procedures for establishing marine parks and reserves which take traditional fishing rights into account have been prepared.

(d) Forestry

It is Government policy to encourage increased harvesting of the native forests until the exotic pine plantations become productive. Thereafter, it is planned to reduce the level of harvesting to slightly below the total growth rate in order to maintain the timber industry in perpetuity. Present predictions under the plantation development scheme call for harvesting to rise to about 290,000m³ annually in 1986/7 and thereafter decline to about 150,000m³ annually by the year 2,000.

It is possible that in the future additional pressure to harvest the rain-forests using means that at present are not seriously being contemplated will occur. For example, the introduction of more advanced harvesting practices and equipment such as helicopter and balloon logging can lead to the selective removal of large, high value species, i.e. Daku, by opening up places now considered inaccessible. Some of the non-commercial stands of trees may become commercially valuable in the future because of rising prices as the world's tropical forests become further depleted, and higher utilisation increases the demand for wood fibre in the form of chips and results in the harvesting of smaller trees.

Once disturbed, tropical rainforests cannot be restored by man to the ecological equilibrium that took thousands of years to develop naturally. The disturbance affects more than the trees destroyed or damaged in the removal process. Although much more needs to be learned about the effects of timber harvesting on tropical rainforests, the ecological system is known to be fragile with many of the plants being so interdependent that they cannot exist without one another. An analysis of the 177 different types of natural phenomena in Fiji (excluding animals) showed that 22 types are protected in Nature Reserves. Although the National Trust has not yet been able to compile a list of rare and endangered plants, sufficient information is available to identify some plants that need protection to ensure their survival. Some examples are the Sandalwood (*Santalum yasi*) and the Sago (*Metroxylon vitiensis*) and Vuleito (*Neoveitchia storckii*) palms.

The majority of native terrestrial vertebrates are forest dwellers. Deforestation alters or destroys the habitat of the birds, reptiles and amphibians and can result in their extinction. For example, there is concern that timber harvesting on the Nacewa Bay peninsula, Vanua Levu, may cause the loss of a species of silktail, a forest dwelling bird, through the destruction of its limited habitat. In addition, the National Trust's preliminary list of endangered animals includes 13 other species. For some of these the preservation of their habitat is important to their survival.

In addition to the commercial harvesting of rainforests they will continue to be depleted to an ever-increasing extent in the vicinity of inhabited areas. This will be due to the greater demands of an increasing population for wood to replace petroleum products as fuel. Next to reclamation, commercial exploitation of mangroves for fuel is the biggest threat to their survival. Two Forestry Department studies have explored the possibilities of utilising mangroves for charcoal. One found that mangroves were the cheapest source of material to replace 25,000 tons of coal imported annually. This would have required between 1,000 and 2,000 hectares of mangroves to be felled yearly. However, the study did not take into consideration the cost of compensation for lost fishing rights nor the value of the loss of potential seafood. The other study found that Fiji wood resources could support a charcoal industry on a commercial scale using waste water, hill timber and mangroves.

It is concluded that:

1. The future of Fiji's rainforest and its wildlife is not bright because:
 - (a) almost all the forested lands are privately owned,
 - (b) Government's policy is to exploit the commercially valuable native trees,
 - (c) there will be increased utilisation of the world's tropical rainforests, including Fiji's, as these become further depleted,
 - (d) there will be increased demand for wood, including mangroves, as a fuel, and
 - (e) disturbance of rainforests through their commercial exploitation can result in far-reaching adverse ecological consequences.
2. There is little accessible lowland rainforest left on the two largest islands and the public is deprived of the opportunity of observing certain species which are of particular scientific interest because of their aesthetic appeal or interesting botanical characteristics.
3. There is a need to protect many additional plants and communities that are unique or representative of Fiji's native flora and wildlife, that are not represented in the existing nature reserves.

(e) Agriculture:

Government's policy of attempting to achieve self-sufficiency in food together with Fiji's growing population, will require maximum utilisation of land suitable for growing crops and raising livestock. The conversion of natural areas for agricultural use will mean the clearing of native vegetation, the draining of swamp lands, the filling of mangrove areas and use of bush-lands or forests for pastoral purposes. The destruction or alteration of the natural vegetation will either eliminate or change the habitat of some of Fiji's wildlife. If this is 'critical' habitat it may eventually result in extinction of some animals, or for example, in the case of mangroves, eliminate a link in the marine food chain.

There is a plan to use Makogai Island to enlarge the Agriculture Department's goat and sheep herds so that surplus animals can be dispersed to other islands to increase the production of goat meat and mutton. Although this would reduce the volume of meat currently imported for consumption (80 per cent of the national requirement), it would pose a considerable threat to the fragile ecosystems of many small islands.

According to incomplete information, most reclamation of mangrove swamps has been for agriculture, and it is anticipated that this will continue to be the major justification in the future. Reclamation involves destruction of mangrove trees such as the *Bruguiera* and *Rhizophora* species and the associated landward communities of ferns and shrubs. Since the former are a biologically productive link in the food chain of marine organisms, their destruction can have serious consequences. Baines (1979) provided some guidelines and recommended interim policies on sound development of mangroves to assist Government agencies to meet their responsibilities in the execution of the mangrove resource policy in DP7.

On receipt of recommendations for an inter-departmental workshop on Mangroves (1982) the Cabinet decided in 1983:

- (a) "that a zoned mangrove map be drawn up urgently and that outside funds be sought from the South Pacific Regional Environment Programme or other relevant agencies to undertake the required work; and
- (b) that there be restraints on further mangrove reclamation pending the preparation of a detailed mangrove management plan, but that those projects in progress and those already approved should proceed."

It was also recommended that the Ministry of Lands convene a monthly meeting of a Mangrove Committee. Such a committee was to consist of senior level representatives from the Departments of Lands and Survey and Town and Country Planning, the Ministry of Forests, the Division of Drainage and Irrigation (Ministry of Primary Industries), the Native Lands and Fisheries Commission and the National Trust for Fiji.

The mangrove project is already underway with consultants and funds provided by SPREP.

It is concluded that because of the importance of agriculture to Fiji every effort should be made to avoid conflicts with future agricultural development schemes when establishing protected areas. As in the case of mining there are usually some alternatives and unless a unique feature requires protection in the national interest, the emphasis should be on the selection of areas of little or no potential for agriculture. It is also concluded that special consideration should be given to the protection of swamp lands, mangroves, and other areas which qualify as 'critical' habitat to endemic animals of subsistence or commercial value, or rare or endangered endemic species including plant life. The greatest threat to mangroves from reclamation schemes is on the two largest islands. Because the mangrove resource is so extensive and its future is to be decided at the highest policy level, the establishment of protected areas should fulfil the objective of protecting and preserving unique species and those being depleted or in danger of extinction. This can be done by creating nature reserves, and as a general practice, incorporating mangrove areas in coastal and marine parks and reserves.

(f) Fishing:

Because of Fiji's increasing population and continuing trend towards urbanisation, especially on Viti Levu, over-exploitation of inshore marine life is now taking place in localised areas near the larger population centres and will increase. Pollution will further deplete the marine life in these areas unless the increasing volumes of domestic and industrial wastes are adequately treated and controlled.

Over-exploitation in the future may take place at other localised areas such as at sites where aquarium organisms are repeatedly collected, and on fringing reefs near large resort hotels where there are nearby villages. At these locations, shellfish and coral are taken by tourists and locals collect these species, or fish, for either subsistence or commercial gain. Certain shellfish are more in demand than others and thus are in greater danger of depletion.

It is concluded that the establishment of marine parks and reserves can best contribute towards the protection, utilisation, and productivity of Fiji's living marine resources by:

1. Re-enforcing the efforts of the Fisheries Division to protect species that are endangered or are being seriously depleted, e.g. turtles, through the preservation of critical habitat and development of measures to protect these species during that part of their life cycle when the habitat is being used;
2. Careful selection of inshore marine areas near population and tourist centres in need of protection or which provide recreation opportunities. These should be chosen only where there is reasonable assurance that pollution or other external conditions over which a park authority has little, if any control, will not adversely affect marine life in the future;
3. Giving emphasis to the protection of marine habitats containing species such as aquarium fish, soft corals and sponges, etc., and promoting research on these species by organisations such as the Institute of Marine Resources, University of the South Pacific to assist the Fisheries Division with their management.

(g) Outdoor Recreation

An analysis has been made of the adequacy of the developed outdoor recreation areas to meet the needs of the population for recreation and the protection of elements of the natural landscape. The existing areas have a capacity to accommodate approximately 1,700 persons at a time, out of a population of over 600,000. They mainly provide opportunities for picnicking and freshwater swimming. In addition, five areas have ocean beaches, four permit camping, two have hiking trails, and two feature scenic views. Most of the areas preserve either coastal strand vegetation, small tracts of rainforest with freshwater streams, or plantations of mahogany and pine.

A study was made of the need for developed outdoor recreation opportunities. It took into consideration all known factors which determine the demand for recreational use such as population, per capita income, leisure time, mobility and social structure. It was found there was a deficiency in the number, variety and capacity of existing outdoor recreation areas, and that these deficiencies would become greater in the future if the supply was not increased. They will occur mostly on Viti Levu where over 90 percent of the urbanised population lives. It is this segment of the population that has the greatest need for outdoor recreation in a natural environment, and especially for the use of reasonably accessible ocean shoreline and beaches. A particularly acute problem exists in the Suva-Nausori region. The 1975 Greater Suva Urban Structure Plan prepared by the Town and Country Planning Department predicts Suva's 1975 population of 175,000 will grow to 214,000 by 1986 and to 294,000 by 1996. A shoreline survey showed that the closest suitable beach area to meet this recreational need is Karobe in the Deuba area 50km west, along the Queens Road. Private property would need to be acquired. In addition to urban needs for easily accessible outdoor recreation areas, it is anticipated that a demand will develop throughout the island group for other areas as transportation facilities are improved.

Fiji has a unique opportunity to capitalise on the recreation potential of the artificial lakes that will be created by its hydro-electric power programme. For example, up to 8,000 hectares of still water may be impounded behind the dams that are planned. If the recreation potential is properly developed it could help meet future needs, especially for water-based activities, since Fiji has few natural lakes. These types of activities are very popular throughout

most of the world, affording opportunities for: fishing, swimming, boating, water skiing, snorkelling and scuba diving together with associated activities such as picnicking, camping and sight-seeing.

The extent of the impact of outdoor recreation on the natural environment depends on whether adequate facilities have been provided, properly maintained, and public use is supervised. In Fiji there has been some adverse impact as evidenced by below standard maintenance of outdoor recreation facilities and extensive use of beaches where neither facilities or supervision are provided. Examples include Natadola and the Deuba area where vegetation has been destroyed by cutting, burning and trampling, and littering has created unsightly and unhealthy conditions. A similar situation is likely to develop at Monasavu since no provisions have been made for public recreational use of project waters or adjacent lands.

It is concluded that:

1. More developed outdoor recreation areas and facilities should be provided to meet present and future needs, particularly for urban residents. These needs include opportunities to participate in a greater variety of activities in both terrestrial and marine areas which have been established to protect and preserve the most unique and significant samples of Fiji's natural heritage.
2. Criteria used for selecting national parks should give high priority to any suitable locations near urban population centres because of the greater outdoor recreation needs and the importance of conserving fuel used for transportation.
3. There is a critical need to acquire and develop a beach-type recreation site in the Deuba area to serve the Suva-Nausori urban region.
4. There is a need to provide camping facilities for both residents and tourists. This would:
 - (a) help prevent degradation of natural areas;
 - (b) provide low cost accommodation for residents;
 - (c) assist the tourist industry by providing suitable accommodation for tourists who prefer to camp.

PART 2: INFORMATION SHEETS ON PROTECTED AREAS

1. NAME OF PROTECTED AREA Ravilevu Nature Reserve
- MANAGEMENT CATEGORY Nature Reserve
- LEGAL PROTECTION
Legislation offers complete protection for flora and fauna.
- DATE ESTABLISHED
Proclaimed under the Forest Act (Chapter 128) in 1959.
- GEOGRAPHICAL LOCATION
Ravilevu Nature Reserve is situated in the south-eastern portion of Taveuni (3rd largest island in the group).
- AREA 4,000 ha
- LAND TENURE Crown Land
- VEGETATION Tropical rainforest.
2. NAME OF PROTECTED AREA Tomaniivi Nature Reserve
- MANAGEMENT CATEGORY Nature Reserve
- LEGAL PROTECTION
Legislation offers complete protection for flora and fauna.
- DATE ESTABLISHED
Proclaimed under Forest Act (Chapter 128) in 1959.
- GEOGRAPHICAL LOCATION
Situated about 80 kms north north-west of Suva.
- AREA 1,350 ha.
- LAND TENURE Crown Land
- VEGETATION Rainforest, sub-montane cloud forest.
3. NAME OF PROTECTED AREA J.B. Garrick Memorial Island Reserve
- MANAGEMENT CATEGORY Nature Reserve
- LEGAL PROTECTION Complete protection
- DATE ESTABLISHED
Proclaimed under National Trust Act (Chapter 265) in 1983.
- GEOGRAPHICAL LOCATION
Situated about 40km west of Suva
- AREA 659 ha
- LAND TENURE Privately owned - National Trust
- VEGETATION Tropical rainforest, some secondary growth.

4. NAME OF PROTECTED AREA Naqaranibuluti Nature Reserve
MANAGEMENT CATEGORY Nature Reserve
LEGAL PROTECTION Complete protection
DATE ESTABLISHED Forest Act (Chapter 128) proclaimed in 1958
GEOGRAPHICAL LOCATION Situated 83km north north-west of Suva
AREA 280 ha
LAND TENURE Crown Land
VEGETATION Rainforest
5. NAME OF PROTECTED AREA Nadarivatu Nature Reserve
MANAGEMENT CATEGORY Nature Reserve
LEGAL PROTECTION Complete protection
DATE ESTABLISHED Forest Act (Chapter 128) proclaimed in 1966
GEOGRAPHICAL LOCATION Situated 5km west north-west of Tomaniivi Nature Reserve.
AREA 93 ha
LAND TENURE Crown Land
VEGETATION Rainforest
6. NAME OF PROTECTED AREA Yaduataba Crested Iguana Sanctuary
MANAGEMENT CATEGORY Wildlife sanctuary
LEGAL PROTECTION Only iguana and vegetation protection offered under agreement.
 Permission to remove feral goats.
DATE ESTABLISHED National Trust Act
GEOGRAPHICAL LOCATION West of Vanua Levu
AREA 170 ha
LAND TENURE Native Land
VEGETATION Dry forest, grassland, beach forest.

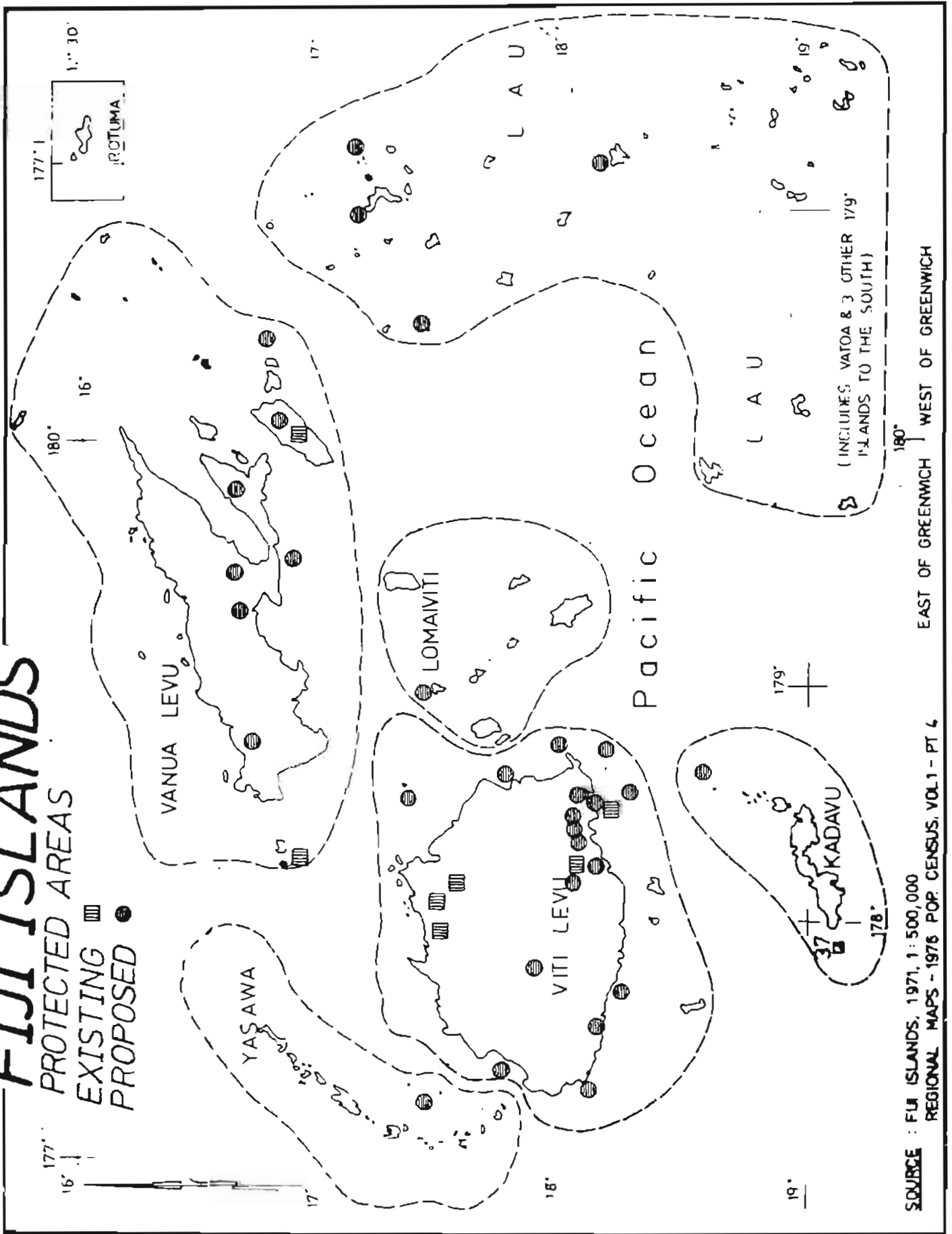
7. <u>NAME OF PROTECTED AREA</u>	Draunibitu, Vuo, Labiko Is.
<u>MANAGEMENT CATEGORY</u>	Nature Reserves
<u>LEGAL PROTECTION</u>	Complete protection
<u>DATE ESTABLISHED</u>	Forest Act (Chapter 128) proclaimed: Draunibitu - 1959 Labiko - 1960 Vuo - 1959
<u>GEOGRAPHICAL LOCATION</u>	Bay of Islands near Suva
<u>AREA</u>	Draunibitu - 2 ha Vuo - 1.2 ha Labiko - 0.3 ha
<u>LAND TENURE</u>	Crown Land
<u>VEGETATION</u>	Lowland forest.

FIJI ISLANDS

PROTECTED AREAS

EXISTING 

PROPOSED 



SOURCE : FIJI ISLANDS, 1971, 1:500,000
 REGIONAL MAPS - 1976 POP. CENSUS, VOL.1 - PT 4

EAST OF GREENWICH WEST OF GREENWICH

GUAM

PART 1 - GENERAL REPORT

INTRODUCTION

Guam is an unincorporated territory of the United States located in the Western Pacific Ocean. With a size of 541 sq.km, Guam is the largest island in Micronesia and had a population in 1980 of 105,979. Guam is located at 13°25'N and 144°42'W.

POLICY

Since Guam has had civilian rule from 1951, efforts have been made to protect conservation areas. Several protected areas were established in 1953. In 1975, the Guam Territorial Park System, administered by the Department of Parks and Recreation, Government of Guam, came into existence. The Guam Territorial Park System includes three protected areas while the Federation Government administers four protected areas (see Map 1).

LAW

The three Government of Guam areas are protected by Public Law 12-209 as either nature preserves whose purpose is to remain unimproved or as conservation reserves which may be improved for the purpose of making them accessible to the public in a manner consistent with the preservation of their natural features. New protected areas of Government of Guam ownership are added by the legislative or administrative action of the Department of Parks and Recreation.

Two of the four federal areas which were established in 1984 by action of the Chief of Naval Operations, United States Navy are administered by the United States Navy as Ecological Reserve Areas. One area is administered by the United States Air Force as a Natural Area that was established by administrative action in 1973. The other federal area is the War in the Pacific National Historical Park (WAPA), created by Federal Public Law 95-348 in 1978. The Ecological Reserve Areas (ERA) are established as a physical or biological unit in which current natural conditions are maintained. The Natural Area is similarly managed. WAPA was established to conserve and interpret outstanding natural, scenic and historic values.

PARKS AND RECREATION ADMINISTRATION

Administration and enforcement are assigned to the entities listed under the Address section below. Each of the offices administers the areas according to their appropriate laws, rules and regulations.

ADDRESSES

For Guam Territorial Seashore Park, Masso River Reservoir Area and Anao Conservation Reserve:

Director
 Department of Parks and Recreation
 490 Naval Hospital Road
 Agana Heights, GU 96910

For Haputo Ecological Reserve Area:

Commanding Officer
 NAVCAMS WESTPAC
 FPO San Francisco 96630

For Orote Peninsula Ecological Reserve Area:

Commanding Officer
 NAVASTA Guam
 FPO San Francisco 96930

For Pati Point Natural Area:

Base Commander
 3rd Air Division
 Andersen Air Force Base, GU 96334

For War in the Pacific National Historical Park:

Superintendent
 War in the Pacific National Historical Park
 P.O. Box FA
 Agana, GU 96910

LIST OF PROTECTED AREAS

Managed Natural Reserves:

Anao Conservation Reserve	-	263 ha
Pati Point Natural Area	-	112 ha
Haputo ERA	-	102 ha
Orote Peninsula ERA	-	66 ha
Masso River Reservoir Area	-	67 ha

Multiple Use Management Areas:

Guam Territorial Seashore Park	-	6,135 ha
War in the Pacific NHP	-	779 ha

LIST OF PROPOSED PROTECTED AREAS

Managed Natural Reserves:

(a) Hilaan Conservation Area	-	658 ha
------------------------------	---	--------

Proposed for establishment once the land is transferred to the Government of Guam from the Federal Government.

PROBLEMS, NEEDS AND PROSPECTS

All protected areas on Guam suffer from inadequate funds for management and enforcement personnel. Related problems include illegal and inappropriate uses such as illegal hunting and fishing, removal of vegetation, burning, and introduced species that result in vanishing endangered species, loss of protected area's size and resources. In most areas, no comprehensive baseline environmental information exists that can be used as a basis for management decisions.

MAPS AND REFERENCES - See Part 2 Information Sheets on Protected Areas and Maps 1 - 8.

PART 2: INFORMATION SHEETS ON PROTECTED AREAS

NAME OF PROTECTED AREA: Anao Conservation Reserve

MANAGEMENT CATEGORY: Managed Nature Reserve

LEGAL PROTECTION:

Partly protected. Allowable uses are hunting, shelling, crabbing, fishing and outdoor recreation activities.

DATE ESTABLISHED: 1953

GEOGRAPHICAL LOCATION:

Located in North-west Guam in the Municipality of Yigo. The Reserve is located at 130° 32'30"N and 144° 56"E.

ALTITUDE:

The Reserve rises from the eastern boundary at the sea coast (0.0m) to an altitude of 161m (528 ft.) above sea level at the top of the limestone plateau cliffs.

AREA 263 ha.

LAND TENURE:

The Reserve is owned by the Government of Guam. Pati Point Natural Area is adjacent to the North.

PHYSICAL FEATURES

A rugged limestone cliff and coral reef abuts the ocean. Inland the topography rises quickly to the limestone cliffs.

VEGETATION:

Vegetation communities are the beach strand and limestone forest. Prominent species in the beach strand are Coconut palms (*Cocos nucifera*), Ironwood (*Casuarina equisetifolia*), Nigas (*Pemphis acidula*), Beach Morning Glory (*Ipomoea pes-caprae*), Nanaso (*Scaerola taccada*), and Beach Sunflower (*Wedelia biflora*). Species in the limestone forest include Federico (*Cycas circinalis*), Screw pine (*pandanus fragrans*), Gulos (*Cyhometra ramiflora*), Fagot, (*Neisosperma oppositifolia*), Kahlao (*Phymatodes scolopendria*), Ifil (*Intsia bijuga*), and the rare Guam endangered *Seriathes nelsonii*.

NOTEWORTHY FAUNA

Present are the Guam deer (*Carrus Phillipinus*), monitor lizards (*Varanus indicus*), and Marianas fruit bat (G,F) (*Pteropus m. Mariannus*). Birds present include the Guam rail (G,F) (*Rallus owstoni*), Micronesian Kingfisher (G,F) (*Halcyon c. cinnamomian*), Marianas Fruit Dove (G) (*Ptilinopus roseicapillus*), White-throated Ground Dove (G) (*Halcyon c. cinnamomina*), Guam broad bill (G,F) (*Myiagra freysineti*), Bridled white-eye (G,F) (*Zosterops c. conspicillata*), Cardinal honey-eater (G) (*Myzomela cardinalis sotfondi*), and Marianas Crow (G,F) (*Corvus Kubaryi*). (G-Guam endangered - F-Federal endangered).

CULTURAL HERITAGE

The Reserve contains the site of the old Chamorro village of Mati. Remains include black midden areas, rock shelters and pottery sherds.

CONSERVATION MANAGEMENT

The area is managed jointly by the Department of Parks and Recreation and the Department of Agriculture to make the area accessible to the public (currently by foot trail) while preserving the natural features.

DISTURBANCES AND DEFICIENCIES

Illegal hunting, fishing and cutting of trees.

SCIENTIFIC RESEARCH

None.

SPECIAL SCIENTIFIC FACILITIES

None at present.

PRINCIPAL REFERENCE MATERIAL

Department of Agriculture, *The Fauna of Guam*, 1981.

Department of Parks and Recreation, *Guam Historic Preservation Plan*, Agana, 1976.

Lotz, David "Making Tracks" *Pacific Daily News*, Agana 1984.

STAFF

None exclusively for the Reserve.

BUDGET

None exclusively for the Reserve

LOCAL ADMINISTRATION

Department of Parks and Recreation
490 Naval Hospital Road
Agana Heights, GU 96910

DETAILED MAP

See Map 2.

NAME OF PROTECTED AREA Pati Point Natural Area.

MANAGEMENT CATEGORY Managed Nature Reserve.

LEGAL PROTECTION Completely protected. No access allowed.

DATE ESTABLISHED
Established by administrative action of the United States Air Force in 1973.

GEOGRAPHICAL LOCATION
Located on Andersen Air Force Base at 13° 35'N, 144° 56'E.

ALTITUDE:
The Natural area rises from the eastern boundary at the sea coast (0.0m) to an altitude of 138m (600 ft.).

AREA 112 ha.

LAND TENURE
The area is owned by the United States Air Force. Anao Conservation Reserve is adjacent to the South.

PHYSICAL FEATURES
A rugged limestone cliff and coral reef abutting the ocean rises immediately to the 100m plus limestone cliffs.

VEGETATION
Vegetation communities are the beach strand and limestone forest. Prominent species in the beach strand are Coconut palms (*Coccoloba nucifera*), Ironwood (*Casuarina equisetifolia*), Nigas (*Pemphi acidula*), Beach Morning Glory (*Ipomoea pes-caprae*), Nanaso (*Scaerola taccada*, and Beach Sunflower (*Wedelia biflora*). Species in the limestone forest include Federico (*Cycas circinalis*), Screw pine (*Pandanus fragrans*), Gulos (*Cuhometra ramiflora*), Fagot, (*Neisosperma oppositifolia*), Kahlao (*Phymatodes scolopendria*), Ifil (*Intsia bijuga*), and the rare Guam endangered *Serianthes nelsonii*.

NOTEWORTHY FAUNA
Present are the Guam deer (*Cervus Phillipinus*), Monitor lizards (*Varanus indicus*), and Marianas fruit bat (G,F) (*Pteropus m. mariannus*). Birds present include the Guam rail (G,F) (*Rallus owstoni*), Micronesian Kingfisher (G,F) (*Halcyon C. cinnamomian*), Marianas Fruit Dove (G) (*Ptilinopus roseicopillus*), White-throated Ground Dove (G) (*Halcyon c. cinnamomina*), Guam broad bill (G,F) (*Myiagra freycineti*), Bridles white-eye (G,F) (*Zosteropa c. Conspicillata*), Cardinal Honey-eater (G) (*Myzomela cardinalis sotfondi*), and Marianas Crow (G,F) (*Corvus kubaryi*). (G-Guam endangered -- F-Federal endangered).

CULTURAL HERITAGE None

LOCAL POPULATION
Andersen Air Force Base has a population of 4,892.

CONSERVATION MANAGEMENT
None at present except no access is allowed.

ZONING Not zoned since Federal property.

DISTURBANCES AND DEFICIENCIES None

SCIENTIFIC RESEARCH None

SPECIAL SCIENTIFIC FACILITIES None at present.

PRINCIPAL REFERENCE MATERIAL

Department of Agriculture, *The Fauna of Guam*, 1981.

Department of Parks and Recreation, *Guam Historic Preservation Plan*, Agana, 1976.

Lotz, David "Making Tracks" *Pacific Daily News*, Agana 1984.

STAFF None.

BUDGET None.

LOCAL ADMINISTRATION Base Commander
3rd Air Division
Andersen Air Force Base, GU 96334

DETAILED MAP See Map 3.

NAME OF PROTECTED AREA Haputo Ecological Reserve Area

MANAGEMENT CATEGORY Managed Nature Reserve

LEGAL PROTECTION

Partially protected. Hunting, shelling, fishing and outdoor recreation activities are allowed.

DATE ESTABLISHED

Established by the Chief of Naval Operations, United States Navy on March 15, 1984.

GEOGRAPHICAL LOCATION

Northwest coast of Guam at 130° 35'N and 144° 50'W located on Naval Communication Area Master Station.

ALTITUDE

From the reef edge (approximately 1.0m) to an altitude at 122m (400 ft.) at the top of the limestone cliffs.

AREA

102 ha of which 73 are land and 29 are water area.

LAND TENURE

The entire area is owned by the United States Navy.

PHYSICAL FEATURES

The offshore double reef and the adjacent coastline abutting coral reef are the water area. The shoreline is rocky limestone cliffs with two sand beach coves. Inland the topography rapidly rises to the top of the limestone cliffs.

VEGETATION

The offshore area is covered by sand and limestone rock with a wide variety of corals and algae. On the land, the limestone forest predominates with Coconut palms (*Coccoloba nucifera*), Screw pine (*Pandanus fragrans*), Hibiscus (*Hibiscus tiliaceus*), Chopa, (*Mannea oderata*), Bamboo (*Bambus vulgaris*), Limeberry (*Triphasia trifolia*), Fish-Kill Tree (*Barringtonia asiatica*), and Federico (*Cycas circinalis*).

NOTEWORTHY FAUNA

The area contains Marianas fruit bat (G,F) (*Pteropus m. mariannus*) and Guam deer (*Cervus Phillipinus*). Birds include Cardinal Honeyeater (G) (*Myzomela cardinalis saffordi*), Mariannas Crow (G,F) (*Corvus kubaryi*), Micronesian Kingfisher (G,F) (*Halcyon c. cinnamomian*), and White-throated Ground-Dove (*Gallicolumba xanthonuva*). (G-Guam endangered -- F-Federal endangered).

CULTURAL HERITAGE

The area contains archaeological remains of a Chamorro settlement including latte structure, a well, midden concentrations and rock shelters. The area also includes a World War II site, Tweed's Cave, where the United States Navy radioman George Tweed hid from the Japanese.

LOCAL POPULATION

The Naval Station has a population of 3,538.

CONSERVATION MANAGEMENT

Managed as a Federal Ecological Reserve in which natural conditions are maintained insofar as possible. A management plan is in draft state.

ZONING

Not zoned since Federal property.

DISTURBANCES AND DEFICIENCIES Illegal fishing with dynamite and bleach.

SCIENTIFIC RESEARCH

Stojkovich, Jeannine O. "Survey and Species Inventory of Representative Pristine Marine Communities on Guam." *Guam Coastal Management Program Technical Reports*, Agana, 1977.

SPECIAL SCIENTIFIC FACILITIES None at present.

PRINCIPAL REFERENCE MATERIAL

U.S. Navy, *Draft Management Plan for the Haputo Ecological Reserve Area*, Pearl Harbor, Hawaii, 1985.

Lotz, David "Making Tracks" *Pacific Daily News*, Agana 1984.

STAFF

None

BUDGET

None

LOCAL ADMINISTRATION

Commanding Officer
NAVCAMS WESTPAC
FPO San Francisco 96630

DETAILED MAP

See Map 4.

NAME OF PROTECTED AREA Orote Peninsula Ecological Reserve Area

MANAGEMENT CATEGORY Managed Nature Reserve

LEGAL PROTECTION

Partially protected. Fishing, shelling, and outdoor recreation activities are allowed.

DATE ESTABLISHED

Established by the Chief of Naval Operations, United States Navy on March 13, 1984.

GEOGRAPHICAL LOCATION

South coast of Orote Peninsula, West Central Guam, at 13° 26'N, 144° 38"E.

ALTITUDE:

From a -18m. (-60 ft.) offshore to a height of 61m. (200 ft.) at the top of the cliffs.

AREA

66 ha. of which 12 ha. is land and 54 ha. is water area.

LAND TENURE:

The entire area is owned by the United States Navy.

PHYSICAL FEATURES:

The area is a limestone cliff face from the top of the cliffs into the water which has no established reef margin. The submerged terraces have interesting tunnel and cave features.

VEGETATION

In the submerged area is an undisturbed coral and algae community. The beach strand community is sparse on the cliff face being composed to Nigas (*Pemphis acidula*) and Nanaso (*Scaerola taccada*).

NOTEWORTHY FAUNA

The Mariannas fruit bat (*Pteropus m. mariannus*), both Guam and Federal endangered and Common terns (*Sterna nivundo longipennis*) are found in the area.

CULTURAL HERITAGE

No features.

LOCAL POPULATION

The Naval Station has a population of 5,633.

CONSERVATION MANAGEMENT

Managed as a Federal Ecological Reserve in which natural conditions are maintained insofar as possible. A Management Plan is in draft stage.

ZONING:

Not zoned since Federal property.

DISTURBANCES AND DEFICIENCIES

Inadequate size to protect the land area.

SCIENTIFIC RESEARCH

Stojkovich, Jeanine O. "Survey and Species Inventory of Representative Pristine Marine Communities on Guam" *Guam Coastal Management Program Technical Reports*, Agana, 1977.

SPECIAL SCIENTIFIC FACILITIES None at present.

PRINCIPAL REFERENCE MATERIAL

U.S. Navy, *Draft Management Plan for the Orote Peninsula Ecological Reserve Area*, Pearl Harbor, Hawaii, 1985.

STAFF

None.

BUDGET

None.

LOCAL ADMINISTRATION

Commanding Officer
NAVSTA Guam
San Francisco 96630

DETAILED MAP:

See Map 5.

NAME OF PROTECTED AREA: Masso River Reservoir Area.

MANAGEMENT CATEGORY Managed Nature Reserve

LEGAL PROTECTION

Partially protected. Allowable activities are fishing, hunting and outdoor recreation activities.

DATE ESTABLISHED

January 14, 1976 by a conditional lease to Government of Guam as a Conservation Reserve.

GEOGRAPHICAL LOCATION

Located within the U.S. Naval Station, Piti, at 130° 27'25"N and 144° 41'30"E.

ALTITUDE

The lowest point is 10m (32 ft) above sea level at the north-western boundary. However, the highest point is located at the south-eastern portion of the Masso Reservoir Area 76m (250 ft) above sea level.

AREA 67 ha.

LAND TENURE

The entire park is leased to the Government of Guam by the U.S. Department of the Interior, for an indefinite period of conditional use as a conservation reserve. However, the area is in dispositional process to the Government of Guam as a Park area.

PHYSICAL FEATURES

The Masso River Reservoir Area has variable terrain. The Park contains three basic physical features:

- 1) the area is of partially modified savannah community;
- 2) a watershed system of two streams flowing into the Masso Reservoir;
- 3) the Masso Reservoir is man made, built in the early 1900's as a potable water resource.

The reservoir dike extends 300' transversely raising the water level by 4 ft. The dike of concrete construction, is coral backfilled adjoining a steel sluice gate for water run-off. The remnants of the Masso Reservoir may have historical significance since it is one of the earliest known U.S. Naval Engineering structures.

VEGETATION

Aquatic vegetation found within the ponding area is dominated by the reed (*Phragmites karka*) in wet areas, and by (*Leucaena leucocephala*) on dry ground. Other principal trees in the area include Hibiscus (*Hibiscus triliaceus*), Screw Pine (*Pandanus fragrans*), African Tulip (*Spathodea campanulata*), Ironwood (*Casuarina equisetifolia*), Camachile (*Pithecellobium dulce*), and Coconut Palm (*Cocos nucifera*).

NOTEWORTHY FAUNA

Aquatic organisms found in the Park area and its feeder streams are eels (*Agnilla marmorata* and *A. bicolor*), three others (*Chonophorus guamensis*, *Microsicydium elegans*, and *Sicyopterus macrostetholepis*), an eleotrid (*Eleotris fusca*), shrimp varieties (*Atya* sp., *coridina* sp., and *Macrobrachium las*), tadpoles of *Bufo Marinus*, and a variety of insect larvae and small invertebrates. In addition to aquatic organisms within the park, there are wild pigs (*Sus scrofa*) and other varieties of small rodents.

CULTURAL HERITAGE

The Masso River Dam is one of the earliest known American Naval construction projects on Guam. The Masso area was also a primary source of potable water in the early 1900's to the surrounding vicinity.

LOCAL POPULATION

Piti Village, where the Masso River Reservoir area is situated, has a population of 2,866.

CONSERVATION MANAGEMENT

The Park area does not presently incorporate a Master Plan. However, development and management are distributed among various agencies. The Department of Parks and Recreation is responsible for co-ordination, planning and facility maintenance. The Department of Agriculture is responsible for promulgation of the fishing rules and regulations.

ZONING

The entire Masso River Reservoir area is not zoned since it is Federal property.

DISTURBANCES AND DEFICIENCIES

Major management problems include poaching, illegal fishing with bleach, illegal wildfire causing erosion, junk vehicles, illegal dumping and agricultural encroachment.

SCIENTIFIC RESEARCH

Department of Agriculture. *"Aquatic and Wildlife Resources Annual Report Fiscal Year 1976 to 1982"*. Agana, Guam.

SPECIAL SCIENTIFIC FACILITIES None at present.

PRINCIPAL REFERENCE MATERIAL

Department of Parks and Recreation. *"Guam Territorial Park Inventory"*. Agan, Guam, 1970.

STAFF

None.

BUDGET

None.

LOCAL ADMINISTRATION

Department of Parks and Recreation
490 Naval Hospital Road
Agana Heights, GU 96910.

DETAILED MAP

See Map 6.

NAME OF PROTECTED AREA Guam Territorial Seashore Park.

MANAGEMENT CATEGORY Multiple Use Management Area.

LEGAL PROTECTION

Partially protected. Allowable uses are hunting, shelling, fishing, ranching, boating and outdoor recreation activities.

DATE ESTABLISHED

December 12, 1978 by Executive Order by Governor Ricardo J. Bordallo, although portions had been protected since 1953.

GEOGRAPHICAL LOCATION

Located in South-west Guam in the Municipalities of Agat, Umatac and Merizo. The Park is generally bounded on the north by 130° 25'N, South by 13° 13'E; East by 144° 44'E, and West by 144° 38'E.

ALTITUDE

The lowest point is 18m (-60') below sea level at the seaward boundary while the highest point is 396m (1,300') at Mount Lamlam, 36% of the Park is water area while the remainder rises promptly from the ocean to the mountains.

AREA

3,596 ha of land and 2,539 ha of water. Protection is uniform throughout the Park, however, the Park is in places divided by non-park private lands.

LAND TENURE

The entire Park is either owned with title or claimed by the Government of Guam with certain areas being claimed by individuals. Certain portions of the Park are leased to individuals from the Government for agricultural and livestock grazing.

PHYSICAL FEATURES

The Park contains three basic physical features. First, the offshore coral formation and island of Cocos Lagoon. Second, the coastline of bays, volcanic formations and islands from Anae Island to Gotuan Bay. Third, the southern mountains from Mt Lamlam to Mt Sasalaguan. In certain areas, the hills from the seacoast to the Mountains are part of the Park.

VEGETATION

Vegetation is divided between submerged and terrestrial. The submerged area includes hard and soft corals, seagrass beds, mangroves and areas of sand and coral rubble.

Terrestrial vegetation communities include limestone forest, savannah, and beach strand community.

Dominant species in the limestone forest include Paipai (*Guamia mariannae*); Bird's Nest Fern (*Asplenium nidus*), Federico (*Cycas aircinalis*), Ifil (*Intsia bijuga*), and Screw Pine (*Pandanus fragrans*). In the savanna dominant plants are Swordgrass (*Miscanthus floridulus*), Foxtail (*Pennisetum polystachyon*), Ground Orchid (*Spathoglottis plicata*), Club Moss (*Lycopodium cernuum*) Savannah Fern (*Dicranopteris linearis*), and the rare Treen Fern (Guam endangered) (*Cyathea lunulata*). In the beach strand are found Hunek (*Messerschmidia argentea*), Nanaso (*Scaevola taccada*), Nigas (*Pemphis acidula*), Coconut Palm (*Cocos nucifera*), and Beach Morning Glory (*Ipomoea pes-caprae*).

NOTEWORTHY FAUNA

Present within the Park are the Guam deer (*Cervus Phillipinus*), Monitor lizards (*Varanus indicus*), Carabao (*Bubalus bubalis*), and Marianas fruit bat (G,F) (*Pteropus m. mariannus*). Birds include the fairy tern (*Cygis alba*), Vanikoro swiftlet (G,F) (*Collocalia vanikorensis*), White-tailed tropic bird (*Phaeton lepturus*), common noddy tern (*Anous stolidus*), Brown Booby (*Sula leucogaster*), and Reef Heron (*Demiguelia sacra*). Reptiles include the green turtle (F) (*Chelonia mydas*), Hawksbill Turtle (F) (*Eretmochelys imbricata*), and the Cocos Island Gecko (*Perachirus aciculatus*). G-Guam endangered -- F-Federal endangered.

CULTURAL HERITAGE

The Park is rich in cultural resources. Every bay contains an archaeological site with pottery sherds, mortars and latte stones. Numerous features exist from Spanish rule including forts and stone bridges. One World War II relic, a Japanese Zero airplane, is within the Park.

LOCAL POPULATION

Three villages exist adjacent to the Park with 1980 populations of Agat (2,908), Umatac (487) and Merizo (1,500) for a total of 4,895.

CONSERVATION MANAGEMENT

The Master Plan for the Park was adopted in 1979. It details development and management among several agencies as follows: the Department of Parks and Recreation is responsible for co-ordination, planning, facility maintenance, outdoor recreation, historic preservation and scenic resources. The Department of Agriculture is responsible for wildlife, aquatic, forestry, wildfires and soil resources. The Department of Land Management is responsible for leases and land registration. The Guam Environmental Protection Agency is responsible for water and air pollution and solid waste. All agencies have active programs in the Park in their areas of responsibility.

ZONING

The entire land portion of the Park is zoned agriculture. Guam does not have a conservation of equivalent zone.

DISTURBANCES AND DEFICIENCIES

Major management problems include poaching, illegal fishing with dynamite and bleach, illegal wildfires causing erosion, junk vehicles, illegal dumps and agricultural encroachment.

SCIENTIFIC RESEARCH

Moore, Philip. "An Ecological Survey of Pristine Terrestrial Communities".

Guam Coastal Zone Management Program, Agana, 1977.

Stojkovich, Jeanine. "Survey and Species Inventory of Representative Pristine Marine Community on Guam". *Guam Coastal Zone Management Program, Agana, 1977.*

SPECIAL SCIENTIFIC FACILITIES None at present.

PRINCIPAL REFERENCE MATERIAL

Guam Territorial Seashore Park Master Plan, Department of Parks and Recreation, Agana, 1979.

Lotz, David T. "Guam's Seashore Splendor", *Glimpses*, Agana, Vol. 21, No. 1.

STAFF

Park Manager - 1; Grounds Worker - 3.

BUDGET

\$70,000 for Fiscal Year 1985.

LOCAL ADMINISTRATION

Department of Parks and Recreation
490 Naval Hospital Road
Agana Heights, GU 96910

DETAILED MAP

See Map 7.

NAME OF THE PROTECTED AREA War in the Pacific National Historical Park

MANAGEMENT CATEGORY Multiple Use Management Area.

LEGAL PROTECTION

Partially protected. Allowable uses are shelling, fishing, boating and outdoor recreation activities.

DATE ESTABLISHED

Established by United States Public Law on August 18, 1978.

GEOGRAPHICAL LOCATION

The Park is located in seven physically separate units: Asan Beach Unit, Asan Inland Unit, Fonte Plateau Unit, Piti Unit, Mt Chachao/Mt Tenjo Unit, Agat Unit and Mt Alifan Unit, generally along the coastline of West Central Guam. The Park is generally bounded on the North by 13° 13'N, South by 13° 22'30"N, East by 144° 44'E, and West by 144° 38'E.

ALTITUDE

The lowest point is approximately 65m (-216') below sea level at the seaward boundaries while the highest point is 313m (1,028') in the Mt Tenjo-Mt Chachao Unit. The Park ranges from low beach areas to mountain tops.

AREA 374 ha of land and 405 ha of water.

LAND TENURE Land ownership is divided as follows:

	<u>Land</u>	<u>Water</u>	<u>Total</u>
Federal	248	78	326
Guam	26	327	353
Private	<u>100</u>	<u>0</u>	<u>100</u>
	374	405	779

The Park has a program to acquire the private land.

PHYSICAL FEATURES

The Park contains sand beaches and offshore reefs, rugged hills and the summits of several mountains.

VEGETATION

Two units contain coral reef ecosystems (Asan Beach Unit and Agat Unit) with various corals, seagrass beds and areas of sand and coral rubble. The sandy beach vegetation is primarily coconut palms (*Cocos nucifera*), although the beach vegetation has been changed. The five other units are either of modified limestone forest containing Breadfruit *Artocarpus mariannensis*, Lemonberry (*Triphasia tritolion*), and Banyan *Ficus prolixa*, or Savanna that includes Swordgrass (*Missanthus floridulus*), Foxtail (*Pennisetum polystachyon*), Ground Orchid (*Spathoglottis plicata*), Club Moss (*Lycopodium cernuum*) and Savanna Fern (*Dicranopteris linearis*).

NOTEWORTHY FAUNA No species of particular importance.

CULTURAL HERITAGE

The primary purpose of the Park is to preserve the historic features from World War II. The Park contains Japanese defensive fortifications including fortified positions, foxholes, caves, structures, Japanese coastal defence guns and military equipment. The two beaches preserved are the assault beaches of the American invasion of July 21, 1944.

LOCAL POPULATION

Four villages exist adjacent to the Park with a 1980 population of Asan (726), Piti (737), Agat (2,908) and Santa Rita (1,264), for a total of 5,635.

CONSERVATION MANAGEMENT

The purpose of the Park is to commemorate the bravery and sacrifice of those participating in the Pacific Theatre of World War II and to conserve and interpret outstanding natural, scenic and historic values and objects on the island of Guam for the benefit and enjoyment of present and future generations. The General Management Plan for the Park has been approved and implemented. Conservation Management is specified to "preserve and interpret important natural features, such as native plant communities and stream and marine bed environments for public use and enjoyment. Efforts are underway in this area.

ZONING

Since the Park came after the zoning of Guam, the Park includes a mixed zoning of Agriculture, Residential and Commercial.

DISTURBANCES AND DEFICIENCIES

Problem areas include grassland fires, poaching, illegal dumping and fishing with bleach and dynamite.

SCIENTIFIC RESEARCH

Eldridge, L.G. *Marine Biological Resources Within the Guam Seashore Study Area and the War in the Pacific National Historical Park*. University of Guam Marine Laboratory, 1978.

Raulerson, Lynn. *Terrestrial and Freshwater Organisms within and Limnology and Hydrology of The Guam Seashore Study Area and the War in the Pacific National Historical Park*. University of Guam, Department of Biology, 1979.

SPECIFIC SCIENTIFIC FACILITIES None at present.

PRINCIPAL REFERENCE MATERIAL

National Park Service. *General Management Plan, War in the Pacific National Historical Park*. Department of the Interior, 1983.

National Park Service. *Environmental Assessment General Management Plan War in the Pacific National Historical Park*. Department of the Interior, 1983.

STAFF

Park Superintendent - 1; Park Ranger - 1; Clerk Typist - 1; Maintenance Supervisor - 1; Other employees are hired on a limited term basis.

BUDGET

\$212,000 for Fiscal Year 1985.

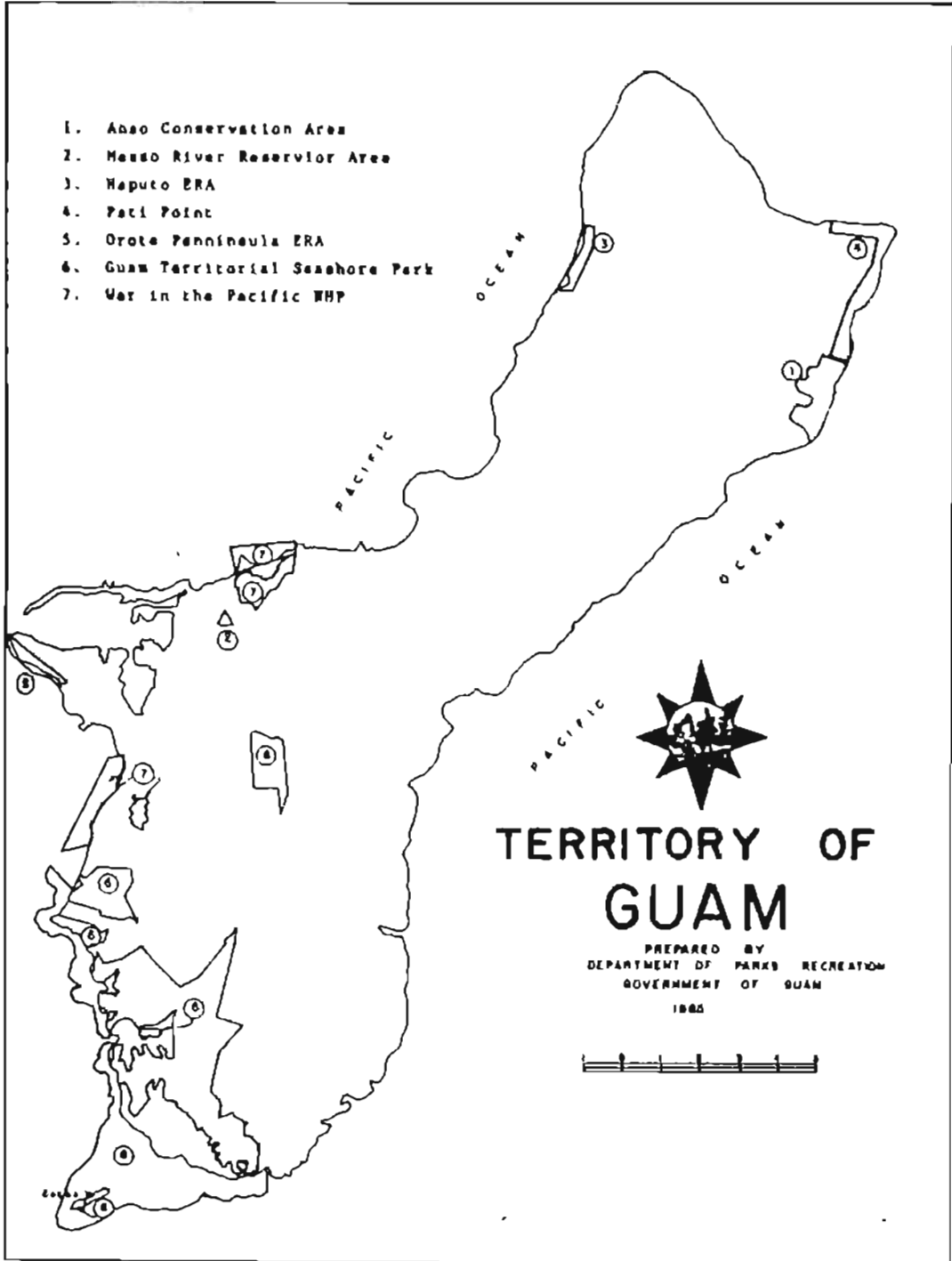
LOCAL ADMINISTRATION

War in the Pacific National Historical Park
P.O. Box FA
Agana, GU 96910

DETAILED MAP

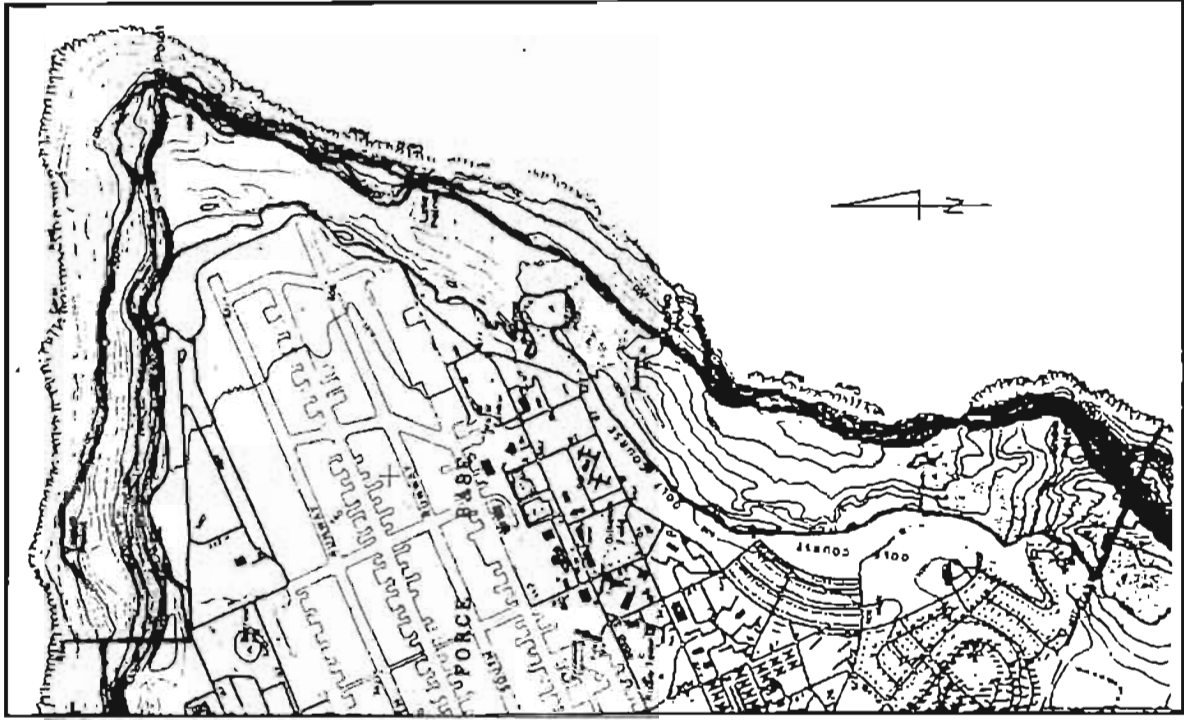
See Map 8.

MAP 1



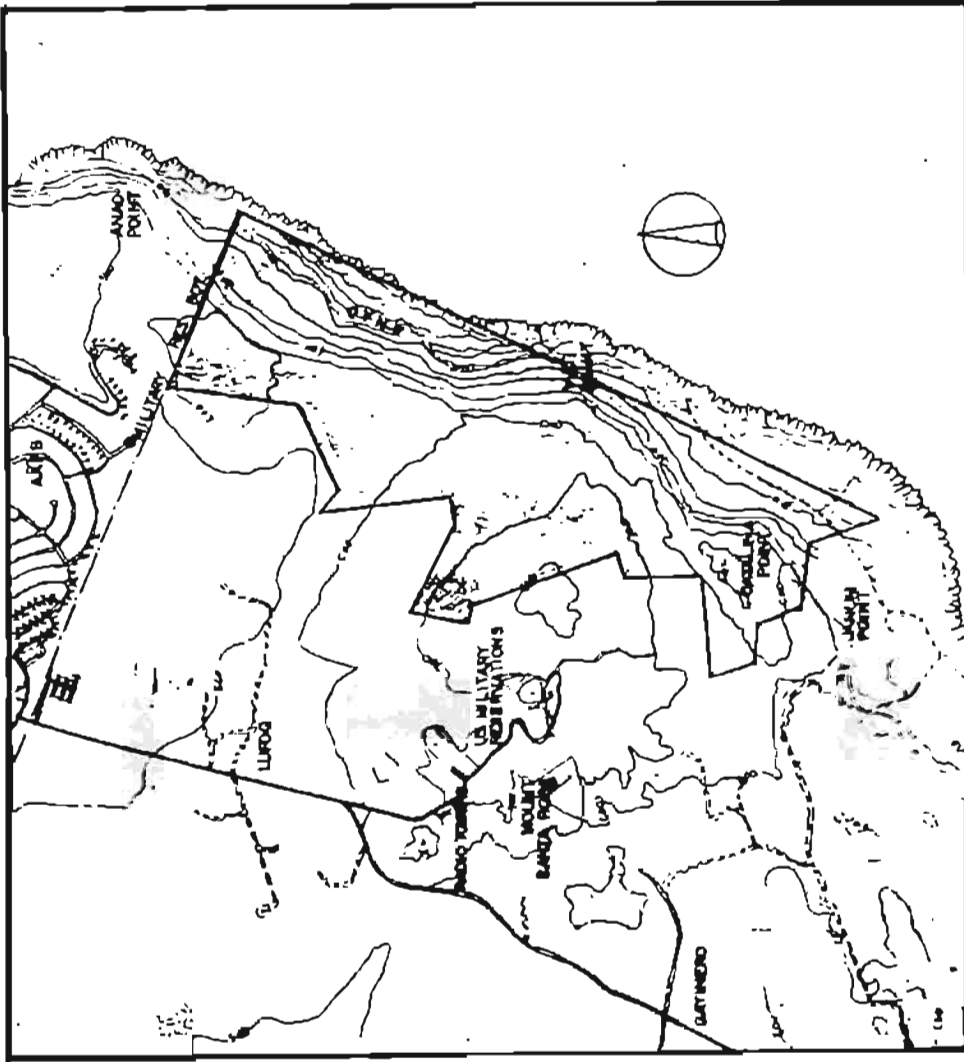
PATI POINT NATURAL AREA

MAP 3

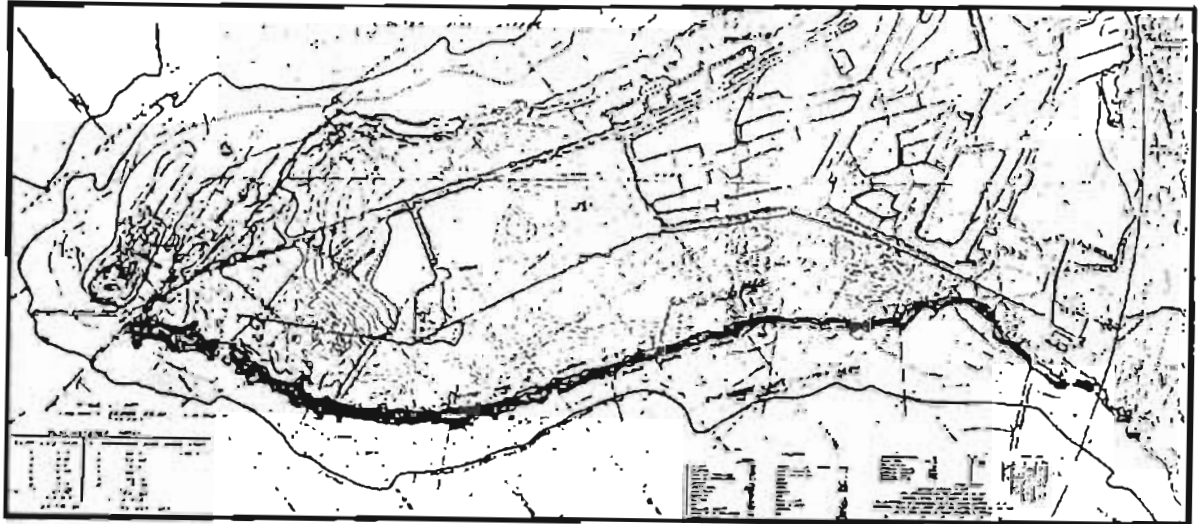


ANAO CONSERVATION RESERVE

MAP 2



OROTE PENINSULA ERA
MAP 5

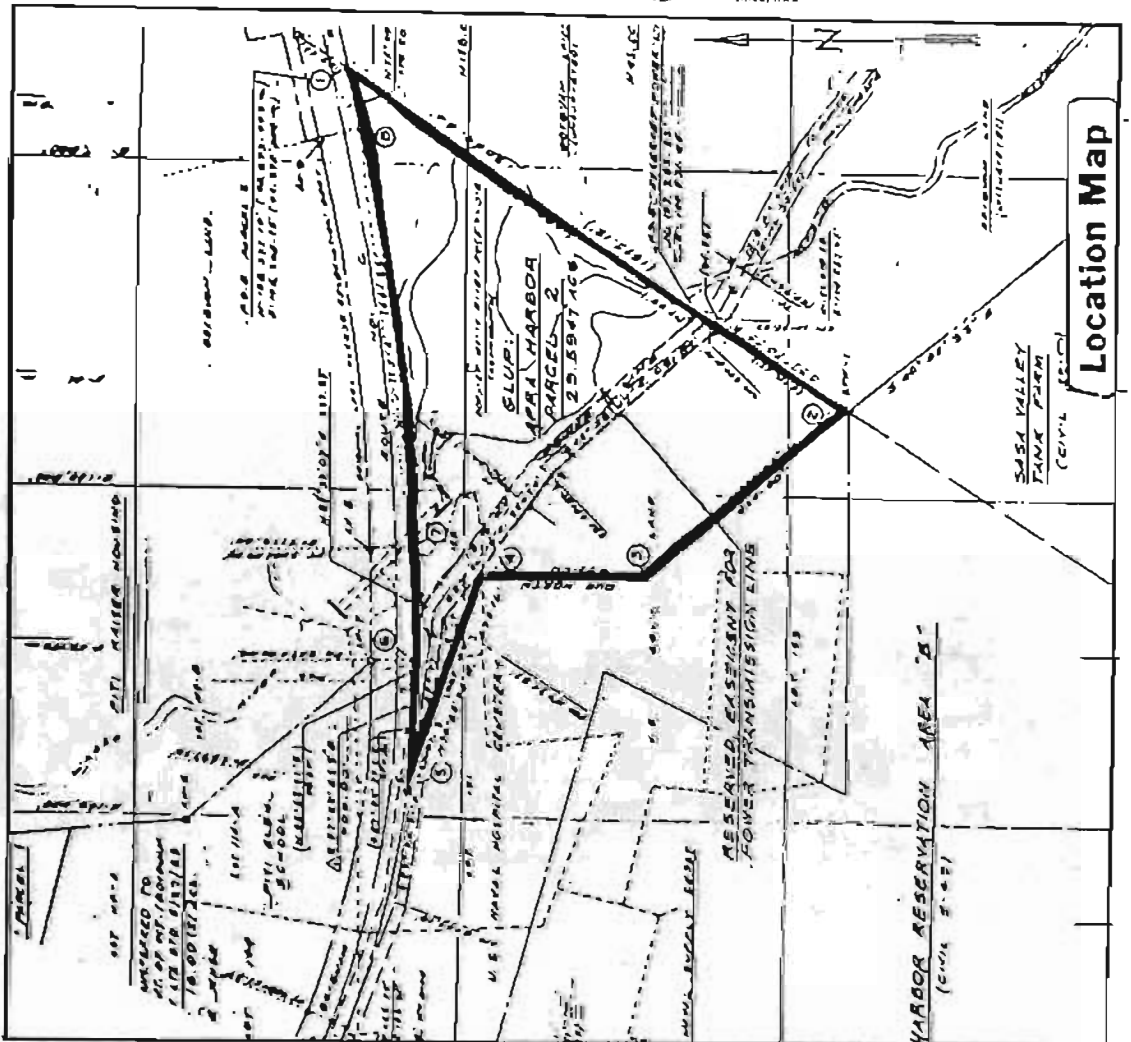


HAPUTO ERA
MAP 4



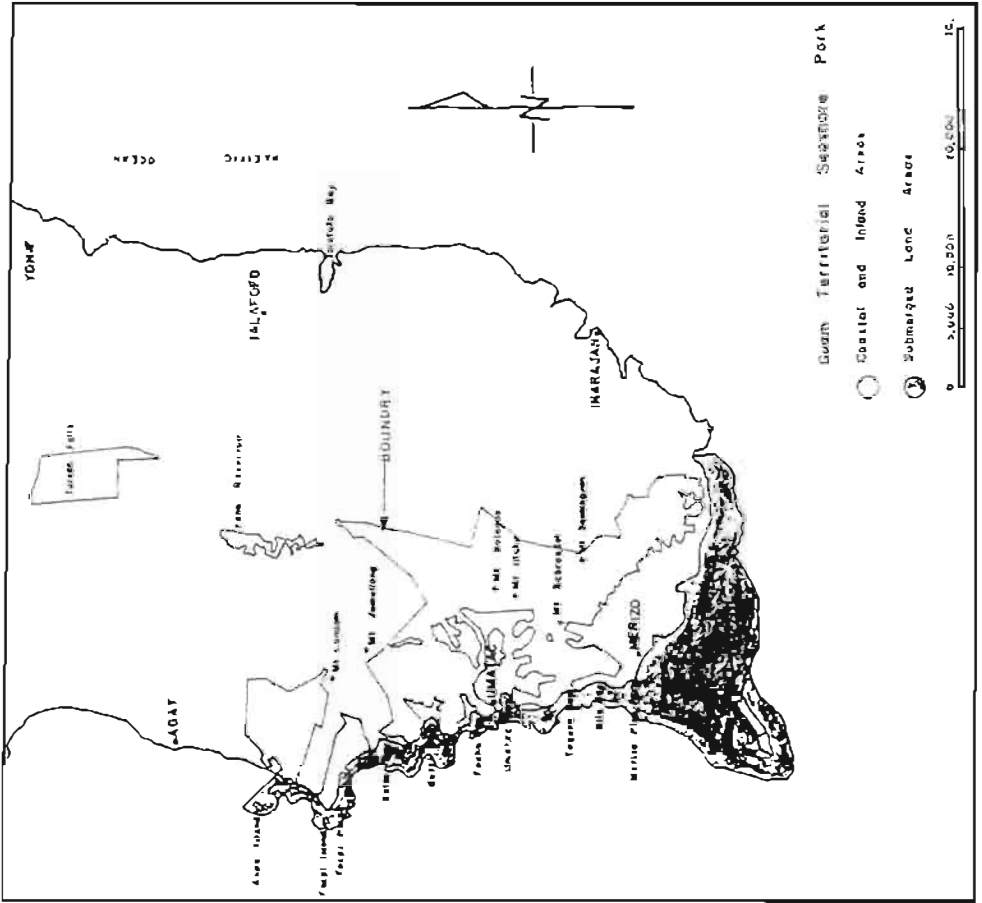
NASSO RIVER RESERVOIR AREA

MAP 6



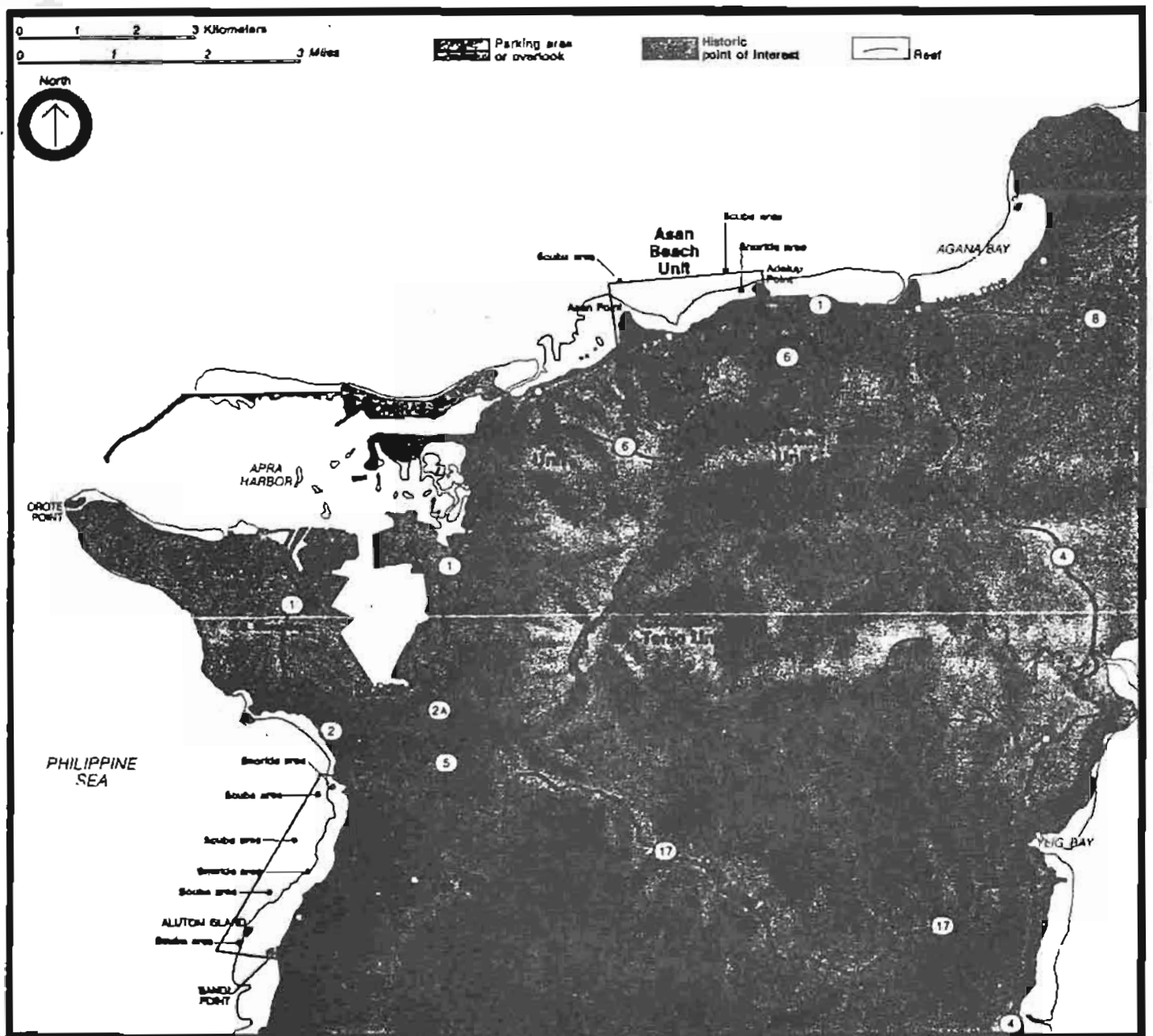
Guam Territorial Seashore Park

MAP 7



WAR IN THE PACIFIC NHP

MAP 8



KIRIBATI

PART I - GENERAL REPORT

INTRODUCTION

Kiribati consists of 3 main groups of islands which are scattered unevenly over more than 5 million square kilometres of ocean (see Map 1). All islands except Banaba are low-lying coral atolls rising to a mere ten feet above sea level and having lagoons which are either partly or completely enclosed. The total land area is approximately 684 square kilometres. Kiritimati, the world's largest coral atoll, comprises approximately one-third of the country's total area. The main groups of islands forming the Republic of Kiribati are the main or the Gilberts Group (17 inhabited islands), the Phoenix and the Line Groups (nine and eight islands respectively). The largest concentration of the population is in the Gilberts Group where all of the land is privately owned. The Phoenix and Line Groups which are situated further east are separated by thousands of miles of ocean. Most islands in these groups are uninhabited and all are government-owned lands. From the 1985 census, the population of Kiribati stands at 63,843.

POLICY

A degree of progress in nature conservation has been made in the last few years particularly since the enactment of the 1975 Wildlife Conservation Ordinance. This has led to the establishment of a protected area system which varies from sanctuary to reserve status. A prospectus for nature conservation in the Line and Phoenix Islands was compiled in 1976 by the Nature Conservancy Council of Great Britain. Included as part of this prospectus was a draft statement of Government policy for nature conservation in these islands. This relates mainly to development and resettlement following economic, social and political decisions which have taken place recently or are forecasted for the near future. In the policy, the Government of the Republic of Kiribati:

- A. recognises the outstanding and unique qualities for science and nature conservation of the Line and Phoenix Islands, and is committed to:
 - A.1 A Policy of maximum possible safeguard of the natural environment of these islands in the face of the growing social and economic needs of Kiribati.
 - A.2 Seeking external advice on matters concerning nature conservation policy and practice for these islands until such time as the necessary knowledge and expertise in these matters becomes available locally (the Minister responsible for nature conservation has appointed an Advisory Committee consisting of local and international representatives to assist him in the determination of a policy).
- B. Shall review and where necessary, survey the entire wildlife resource including terrestrial and marine flora and fauna and physiological features of the Line and Phoenix Islands and shall as necessary, classify, select and gazette and manage sites and islands for the conservation of nature, and encourage research into, and the conservation of the natural systems of the sites and islands so gazetted.

- C. Having enacted the Conservation Ordinance 1975, pledged itself to the implementation of the terms of the Ordinance and in the light of a new information and environmental and social change in the Republic of Kiribati as a whole, gives priority to the development of new legislation as it becomes necessary to conserve natural reserves.
- D. Recognises the special place of Kiritimati with regard to settlement, development and nature conservation and make provision for nature conservation within development planning for Kiritimati.
- E. Will welcome scientific expeditions from other countries to explore, survey and monitor the Line and Phoenix Islands.
- F. Shall appoint within the portfolio of a Minister, the responsibility of oversight and provision of an annual report to the Government on the implementation of these policies and to advise on the framing of new policies.

LAW

A. The legal basis for nature conservation in the Line and Phoenix Islands is the Wildlife Conservation Ordinance of 1975. This was amended in 1979 and an updated version has been passed. (Refer Appendix 1 page 119 of Part 3 of the Management Plan for details). The object of the Ordinance was "to provide for the conservation and protection of birds and other animals". It basically makes three different kinds of provisions for conservation:

- i) Protection of species of birds and other animals. All regularly occurring species of birds, their eggs and nests are fully protected throughout Kiribati with 31 species listed in Appendix B Schedule 1 page 128 of Part 2 of the Management Plan. Schedule 1 of the Wildlife Conservation Ordinance Chapter 100 is also relevant. The Ordinance also covers full protection of Green Turtles, their eggs and nests in most of the Line and Phoenix Islands with Fanning, Washington, Canton and Enderburg being excluded. It is not clear whether Green Turtles are protected at sea in these areas. Possession of any part of a fully or partially protected species is made unlawful by Section 9 of the Ordinance.
- ii) Protection of areas of conservation importance.
 - (i) Wildlife Sanctuaries - areas where no person shall hunt, kill or capture any bird or other animal (other than a fish) or search for, take or wilfully destroy, break or damage the eggs or nests of any bird or other animal. (Section 8 sub-section 2 of the Ordinance). There are at present seven Wildlife sanctuaries.
- iii) Closed Areas.

These must be enclosed within the wildlife sanctuary. Protective status is similar in most cases to those areas having sanctuary status except that no person shall enter or be in a closed area without a valid written licence. The exceptions are Wildlife Wardens and Public Officers acting in the course of duty. At present there are seven closed areas, two of which are entire islands on their own and the rest are within the Kiritimati Island sanctuary.

B. The Wildlife Conservation Ordinance also makes provision for the Minister responsible to be able to designate further sites or areas where wildlife protection is deemed necessary. In this case the responsible Minister will consult Cabinet for this purpose. This provision has now enabled the Minister to designate closed areas commencing in 1985 with the declaration of Sooty Tern nesting sites as closed areas throughout Kiribati - to be endorsed each breeding season. The legislation thus also provides for the management flexibility that may be required from time to time. In 1980 the Government of the Republic of Kiribati accepted accession to the International Ramsar Convention and eleven sites in the Line and Phoenix Groups were recommended for the purpose of the Convention. These include four Wildlife Sanctuaries, two island reserves and four other reserves within the Kiribati Wildlife Sanctuary.

PARKS AND RESERVES ADMINISTRATION

Parks are not yet established in the Line and Phoenix Islands. Reserves now in existence are managed by a small Unit which comes directly under the control of the Ministry of Line and Phoenix Groups. The three-man team of wildlife wardens in the Unit have been carrying out the law enforcement work in addition to their other duties. Only reserves or closed areas on Kiribati are being looked after closely. As a wildlife sanctuary Kiribati, as a whole, also comes under the lawful protection status in current management. The other sanctuaries and reserves, most of which are uninhabited, have been left alone and are seldom, if ever visited. Personnel gradings within the Unit's establishment at present stand at one Wildlife Warden and two Wildlife Assistants. The grading of personnel does not vary significantly for the type of job they do.

ADDRESSES

Ministry of Line and Phoenix Islands
Kiribati (Christmas Island)
Line Islands
Republic of Kiribati.

LIST OF PROTECTED AREAS

	<u>Name of Area</u>	<u>Land Area (ha)</u>	<u>Management Category</u>
1.	Kiribati (Christmas Is.)	32,100	Wildlife Sanctuary
2.	Malden Island	3,930	Wildlife Sanctuary and closed area.
3.	Starbuck Island	1,620	Wildlife Sanctuary and closed area.
4.	Phoenix Island	65	Wildlife Sanctuary (proposed closed area).
5.	McKean Island	57	Wildlife Sanctuary (proposed closed area)
6.	Vostok Island	24	Wildlife Sanctuary (proposed closed area)
7.	Birnie Island	20	Wildlife Sanctuary (proposed closed area)

The islets within Kiritimati

<u>Name of Area</u>	<u>Land Area (ha)</u>	<u>Management Category</u>
8. Motu Ubua	10 (approx)	Closed area
9. Cook Island	8 (approx)	Closed area
10. Ngaontetake	3 (approx)	Closed area
11. Motu Tabu	2 (approx)	Closed area
12. North-west Point Reserve	125 (approx)	Closed area

All sites listed above with the exception of Kiritimati Island Wildlife Sanctuary and North-West Point (but including the islets of Kiritimati) have been listed under the International Rmasar Convention on Wetlands of International Significance.

LIST OF PROPOSED PROTECTED AREAS

As indicated in the List of Protected Areas above, it is proposed that four island sanctuaries, regardless of their sanctuary status, will be declared closed areas due mainly to their isolation, inhospitality to any development and their small size. These islands contain nothing of interest other than their birdlife. Recommendation for their proposed closed reserve status was outlined in the Management Plan for Nature Conservation in the Line and Phoenix Islands. It is quite likely that the Government of the Republic of Kiribati will welcome the proposal.

PROBLEMS, NEEDS AND PROSPECTS

As is the case elsewhere, the development and implementation of policy relating to conservation issues faces problems and needs which vary in nature and degree. The lack of facilities, equipment and outside assistance make conservation measures more difficult to implement, especially when the nature of the area is taken into account. Publicity and information on any conservation issue takes time to be absorbed and appreciated in the minds of the local community. Educational materials have proved very useful in educating the public and improving conservation awareness.

PART 2: INFORMATION SHEETS ON PROTECTED AREAS

NAME OF PROTECTED AREA Kiritimati (Christmas Island)

MANAGEMENT CATEGORY

Managed Nature Reserve/Wildlife Sanctuary for the protection of the wildlife.

LEGAL PROTECTION

The Wildlife Conservation Ordinance of 1975 prohibits the hunting, capturing or killing of birds or other animals other than fish within a Wildlife Sanctuary. Special protection of a 'closed area' status or nature reserve has been afforded to five areas within this sanctuary with several others expected to be designated temporarily and seasonally from time to time in conjunction with the twice-annual breeding cycle of the Sooty Tern.

DATE ESTABLISHED

29th May 1975 - The Wildlife Conservation Ordinance amended in 1979, listed Kiritimati among others as a wildlife sanctuary for the purpose of wildlife protection. The amendment covers a new reserve which was proposed for 'closed area' status earlier in the same year.

GEOGRAPHICAL LOCATION

Kiritimati Island, 2°N, 157° 20' W, lies about 2,500 km south of Honolulu and 2,700 km north of Tahiti. It is 670 km north north-west of Malden Island Nature Reserve and some 2,000 km east of the Phoenix Group.

ALTITUDINAL RANGE

Characteristic of atolls, Kiritimati is low-lying and generally flat with a maximum height of up to 3 metres above sea level. However the highest point on the island is among a series of natural sand dunes which rise up to about twelve to thirty metres.

AREA

Kiritimati has a total land area of 32,100 hectares and a roughly equal area of saltwater and supersaline lagoons. Apart from its five nature reserves, Kiritimati does not consist entirely of zones in which conservation of nature takes precedence.

LAND TENURE

The Kiritimati Island Wildlife Sanctuary is entirely government-owned land.

PHYSICAL FEATURES

Kiritimati was formed between the Cretaceous and Eocene divisions of the late Mesozoic and early Cenozoic periods, as part of a line of submarine volcanoes. It is composed entirely of coral and other biogenic rocks overlying the volcanic rocks of the island's ridge. Seismic, gravity and magnetic measurements have shown that the coral overlay is thinnest near Motu Tabu nature reserve in the main lagoon, where it is 30 to 60 metres thick. Elsewhere the coral overlay exceeds 120 metres in thickness. The development of the major geomorphologic features is the result of linear patch reef growth and a progressive westward and northward infilling of the main lagoon, perhaps aided by a slow north-eastward tilting of the entire atoll. As sea levels rose to a maximum of 2 metres above their present level sometime within the last 5,000 years, Kiritimati Island was almost entirely submerged, although lagoon patch reef development kept pace with the rising sea level. During the brief stand-still and the subsequent eustatic fall of sea level, the reefs were planed off, supplying sediment to the emerging lakes. Recent sedimentation rates in the lakes were at least 1.8cm per year over the 15 years following the 1957 bomb test.

CLIMATE

Situated in the equatorial dry zone, the rainfall is low and unpredictable with periodic and at times severe droughts. The prevailing easterly trade winds blow throughout the year, and the temperature is very stable, varying from 24° to 30°C with a relative humidity averaging about 70%. The rainfall is seasonal, being usually heaviest from January to June and driest from September to November. Annual rainfall varies from the lowest of 0.177 metres to as high as 2.621 metres.

VEGETATION TYPES

The natural vegetation is generally low in appearance and is closely correlated with landform unit, soil type, etc. It is predominantly of *scaevola* scrub, found either as single species stands alone, or associated with others. *Suriana* scrub dominates the lower lagoon flats and thickets occur elsewhere, particularly on low-lying soils of lagoon origin. The three small clumps of *Pisonia* on Kiritimati are the only patches of indigenous forest. *Lepturus* dominated grasslands cover large areas of the coastal plain units. It is mixed with varying amounts of *Boeharvia*, *Portulaca*, *Cassutha*, *Tribulus* and *Heliotropium*, often with scattered clumps of *scaevola* and *Messerschmidia* also present.

NOTEWORTHY FAUNA

The main faunal interest of Kiritimati is its birdlife. Kiritimati has the widest variety of some of the largest populations of tropical seabirds anywhere in the world with an estimated population of some 6 million birds regularly using or breeding on the island (Garnett 1981). The only species of landbird is the Kiritimati Island Warbler. The Sooty Tern alone numbers several million and has the habit of breeding twice annually on Kiritimati. At present there are no truly threatened species among the seabirds but there is a need to safeguard the habitat, especially of the least numbered species, from all possible human disturbances. The future of the warbler is uncertain. The population is confined to the north-west part of Kiritimati where it is anticipated all of the future development will take place. It is considered of international importance; therefore the setting aside of a specific reserve for its protection is considered appropriate on the grounds that the species is potentially at risk from future anticipated developments.

CULTURAL HERITAGE

Kiritimati is important culturally for its multi-complex system of subsidiary land-locked lagoons most of which abound in milkfish. Economically speaking, this is an important feature of the island. A large area of the central lagoon region which encompassed a series of inter-connected ponds is presently managed by the Fisheries division for the rearing and harvesting of milkfish. The whole region was formerly a brine shrimp development project area which, for various reasons, came to an end in 1978. No sites of special historical interest exist on the island except for ruins and other structures left from the H-Bomb era. Few archaeological sites have been reported.

LOCAL POPULATION

The three main areas of residence are the villages of London, Banana and Poland. A fourth village recently appeared called Te Riiti which was leased to people of long-term status on Kiritimati. The present population is around 1,700 individuals (government employees and their families).

CONSERVATION MANAGEMENT

Present conservation management includes law enforcement, feral and domestic animal control, seasonal surveys of wildlife (birds) and education. Law enforcement involves regular patrolling of reserves and other key seabird areas as well as enforcing the Control of Animals Order. The control of domestic and feral animals (in this case cats and pigs)

involves hunting and live trapping. Hunting and trapping are both carried out in the wild but only trapping is carried out in and around the villages. Trapping in the villages is aimed at stray cats which are thought to regularly boost the wild population. The Management Plan for Nature Conservation in the Line and Phoenix Islands provides detailed information on various management activities for the first five years from 1982. Wildlife surveys are focused mainly on census taking and the mapping of bird colonies. Recent work has been directed towards population assessment and mapping of Wedge-tailed shearwater and sooty tern colonies. A survey of the Christmas Island Warbler was undertaken in 1981/82 to identify the distribution pattern and population density as well as other ecological habits of this species. Environmental education involves a programme of teaching in the schools which began in 1977 and has been continuing since then. The environmental courses that have been given include those on the birdlife and plantlife of Kiribati, atoll ecology, marine life, etc. Teaching materials provided by the South Pacific Regional Environment Programme have been used continuously to supplement the children's lessons.

A teaching booklet in both English and Kiribatese will be printed in England soon. Public talks about the wildlife and other conservation issues have also been held with members of each village community on the island. This will be continued from time to time. Interpretation programmes have not been adopted due to the lack of facilities and premises.

A land-use map (Map 2) of the whole of Kiritimati has been drawn up which shows areas of commercial/residential development, protected fisheries areas, closed and proposed closed areas and sanctuaries for the wildlife. The map also shows that about two-thirds of the total land area restricts development of any kind except under exceptional circumstances. Most of this area has been recommended in the Management Plan as proposed wildlife sanctuaries and reserves. These also include protected fisheries areas within their zones.

DISTURBANCES AND DEFICIENCIES

The major management problem at present is predation of the birdlife by cats. This is the most serious threat to the future well-being of the wildlife. Feral cats are scattered far and wide over the entire atoll and in such large numbers that implementing any control measures will be very costly. Poaching is not a major management problem. However some three or four cases of either poaching or illegal entry into reserves has occurred. Several fires have occurred in the last three years as a result of carelessness by children and copra cutters. An outbreak in 1983 affected a small portion of the Sooty Tern colony and damaged about 500 hectares of a coconut plantation. Agricultural encroachment is not a problem at present.

SCIENTIFIC RESEARCH

Various research activities have been undertaken on the wildlife (birdlife) of the island notably that by Dr Schreiber of the Los Angeles County Museum of Natural History. Dr. Schreiber commenced his study in 1967 and his work is a long-term project. His study is focused on various aspects of breeding, population distribution and density, feeding, etc. Current results may be obtained direct from him.

SPECIAL SCIENTIFIC FACILITIES

Not available and there is no likelihood of possible availability in the future.

PRINCIPAL REFERENCE MATERIAL

The Management Plan for Nature Conservation in the Line and Phoenix Islands provides a full account of the natural features and conservation management of Kiritimati.

STAFF

Three persons with posts defined as Wildlife Warden and two Wildlife Assistants.

BUDGET

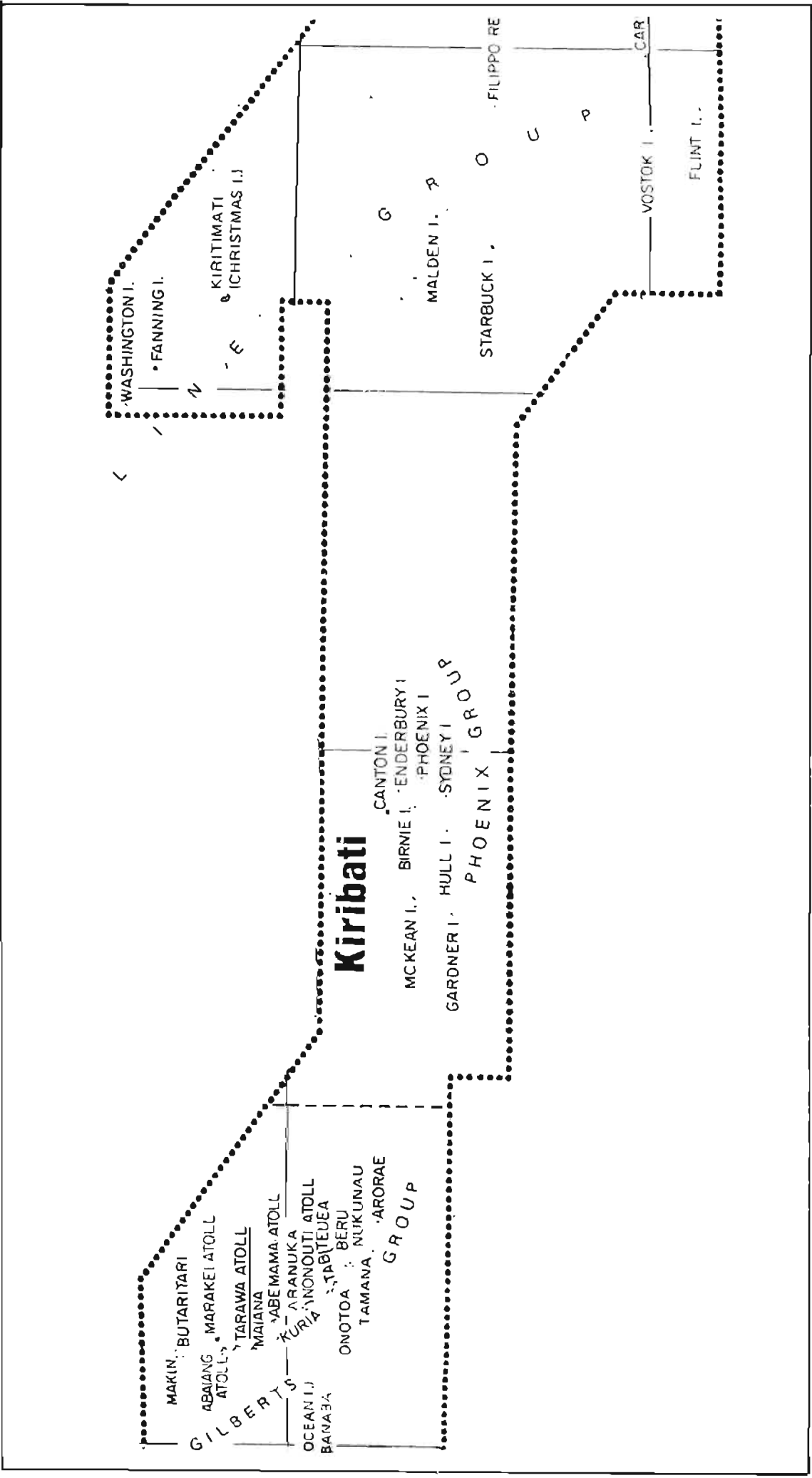
Costs are absorbed in Ministry of Line and Phoenix budget.

LOCAL ADMINISTRATION

Ministry of the Line and Phoenix Islands,
Kiritimati,
Line Islands,
Republic of Kiribati.

MAP

As per Maps 1 and 2 attached.



Kiribati

MAKIN, BUTARITARI

ABAIANG, MARAKEI ATOLL

TARAWA ATOLL

MAIANA

ABE MAMA ATOLL

ARANUKA

KURIA, NONOUTI ATOLL

TABITEUEA

ONOTOA, BERU

TAMANA, ARORAE

GROUP

CANTON I.

MC KEAN I., BIRNIE I., ENDERBURY I.

PHOENIX I.

SYDNEY I.

HULL I.

GARDNER I.

PHOENIX ISLANDS

WASHINGTON I.

FANNING I.

KIRITIMATI
(CHRISTMAS I.)

G

MALDEN I.

STARBUCK I.

FILIPPO RE

VOSTOK I.

FLINT I.

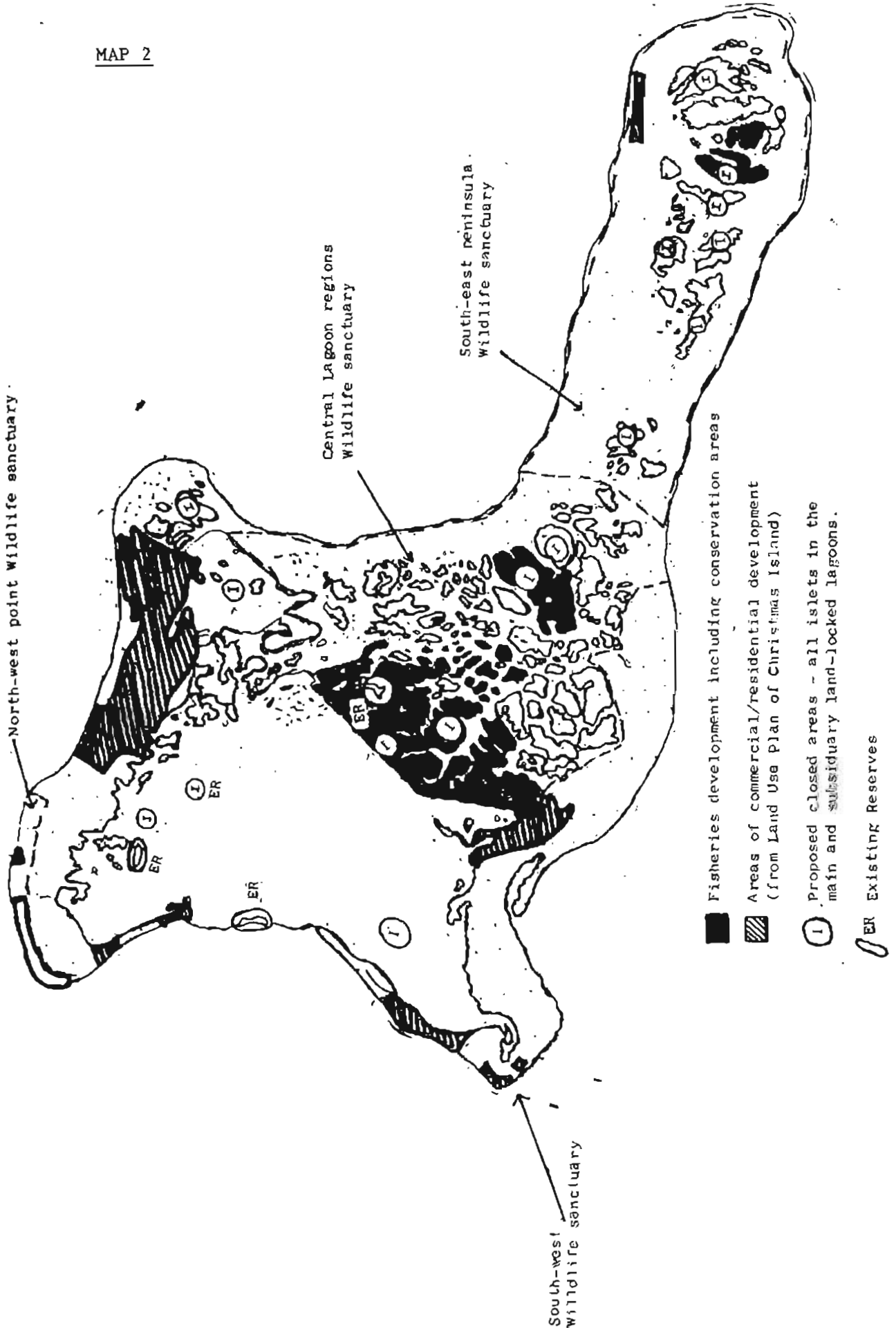
GILBERT I.

OCEAN I.

BANABA

MAP 2

PROPOSED WILDLIFE SANCTUARY AND CLOSED AREAS
(Kiritimati)



NEW CALEDONIA

PART I - GENERAL REPORT

INTRODUCTION

New Caledonia is a large Pacific island almost entirely surrounded by a coral lagoon. It lies on latitude 20° South and has a north-west to south-east attitude, with a backbone mountain range called the Central Range running down the middle.

This brief description already partly explains the remarkably interesting ecology of the territory, which has been geographically isolated for over 250 million years, and which has a coral lagoon considered to be the largest in the world. These features give rise to an island of unique environmental and ecological value.

The geographical position of the island, which has a well-watered east coast and a drier west coast, extensive plains and mountain masses, and a great subsoil diversity stemming from different geological origins, has given rise to a wide range of environments which support a remarkable variety of plant species: over 3,000 indigeneous plant species of the higher orders compared with only 1,750 such species in Fiji (for an equal land area) and 1,460 in New Zealand (for a land area fourteen times larger).

Having remained isolated for a very long time, the flora of the island (and with it a large part of the terrestrial animal wildlife) evolved separately from the rest of the world. More than 80 percent of the 3,000 species mentioned above are the product of this separate evolution and are endemic to New Caledonia. Among the animals, which are less well researched, especially the invertebrates and the underground fauna, the percentage of endemic species is also very high. Experts have therefore had to classify New Caledonia as a separate floristic region with the rest of the Pacific, i.e. over one-third of the earth's surface, comprising only two other regions.

The long geographical isolation, which gives rise to endemism, and even the great diversity, which is probably the result of excessive specialisation, has numerous disadvantages when it comes to coping with aggressive species from outside the island. The natural environment where for 250 million years many primitive strains have managed to survive because of a lack of competition from new arrivals, represents an evolutionary cul-de-sac and is singularly ill-equipped for adaptation. In other words, it is an undynamic environment that is sensitive to any change and very vulnerable.

MAIN FEATURES

New Caledonia is a French Territory with a population of 145,000 (figures from last census, conducted in April 1983). Its land area is 19,058 sq.km. (16,750 km² for the main island) which gives a very low population density of about 7.5 people to the square kilometre.

However the population is very unevenly distributed over the Territory, since 85,000 people live in the urban and suburban area of Noumea-Dumbea-Paita-Mont-Dore. The Loyalty Islands have only 15,500 inhabitants.

The ethnic breakdown of this population shows a predominance of two groups: Melanesian 42.6%, European 37.1%, Wallisian 8.1%, Tahitian 3.8%, Indonesian 3.7%, Vietnamese 1.6%, Ni-Vanuatu 0.8%, other (West Indians, Reunion Islanders, etc) 2.0%.

The main economic activity of New Caledonia is mining and metallurgical processing. Tourism and agriculture account for only a small percentage of the gross territorial income. However, subsistence agriculture remains the main activity of the Melanesian community in the rural areas.

A land use survey with a view to assessing the farming potential of soils was carried out by ORSTOM in 1975 ("Etude des sols de la Nouvelle-Caledonie" - published in 1978). Its findings were as follows:

<u>Category of Land</u>	<u>Surface area (ha)</u>	<u>%</u>
Arable land	30,000	1.8
Grazing land	180,000	11
Land with good forestry potential	465,000	28.2
Land with poor forestry potential or to be preserved in its natural state	460,000	28
Land to be preserved in its natural state	<u>505,000</u>	<u>31</u>
	<u>1,640,000</u>	<u>100</u>

Considering the very small areas at present under crop, New Caledonia possesses sufficient potential productive land for its needs, despite the poor natural fertility of its soils and their high vulnerability to erosion.

This table showing the farming potential can usefully be compared with the two following ones, showing the different types of soil cover and the different types of land tenure existing in New Caledonia.

<u>Types of soil cover</u>	<u>Surface area (ha)</u>	<u>%</u>
Dense forests	374,000	22.8
Naiouli woodland	226,000	13.8
Low scrub (on mining land)	412,000	25.1
Crops, grazing	82,000	5
Lakes, ponds	4,000	0.2
Urbanised land	2,000	0.1
Land liable to flooding	16,000	1
Savanna grasslands	355,000	21.7
Thick shrub	136,000	8.3
Mangroves	21,000	1.3
Bare land	<u>11,000</u>	
(From the 1974/75 Forest Survey)	<u>1,639,000</u>	<u>100</u>

<u>Land Tenure</u>	<u>Approximate Surface area (ha)</u>	<u>%</u>
Territorial land	900,000	54.9
Municipal land	10,000	0.6
Privately owned land	270,000	16.4
Privately rented land	80,000	4.9
Melanesian reserved land	<u>380,000</u>	<u>23.2</u>
	<u>1,640,000</u>	<u>100</u>

TERRITORIAL ENVIRONMENTAL POLICIES

Protection of the natural heritage is one of the objectives of all the development plans and projects drawn up in the past years. The Territory has full legislative and judicial powers in environmental matters and the existing legislation covers virtually all fields where the quality of life is at risk:

- fresh water
- sea and lagoon
- air
- scenic, historical or archaeological sites
- mineral deposits
- forests
- fauna and flora
- agriculture and livestock production.

Furthermore, three international conventions are already in force in New Caledonia, since they were formally ratified by France:

- the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora;
- the Apia Convention on Conservation of Nature in the South Pacific (which will, however, only come into force when a fourth government has signed it);
- the London Convention on the prevention of marine pollution by dumping of wastes (MARPOL).

LEGISLATION ON PARKS AND RESERVES

The core text for the protection of nature is a resolution of the Territorial Assembly adopted in 1980 and based on the definitions proposed by the I.U.C.N. It establishes, in New Caledonia, strict nature reserves, territorial parks, and special reserves, the latter being for the protection of either marine or terrestrial fauna or flora.

There are, in fact, a number of sea areas containing reefs and islands that are totally or partially protected both for the purpose of species conservation and for stock management and scientific studies.

Besides these protected areas established "with a view to ensuring the protection of nature", there are a number of areas that are partly or totally protected under the existing mining legislation. In these areas, prospecting and mining operations, as well as quarrying, may be strictly controlled and even prohibited, with a view to controlling and preventing pollution.

Lastly, in New Caledonia there are a few small zones where activities are restricted for the purpose of "good management of public land". These are afforestation zones and lands allocated to the Forestry Department for the production of timber (tree planting and felling), in which certain measures for the protection of wildlife may also be applied.

OFFICIAL BODIES RESPONSIBLE FOR ENVIRONMENT AND NATURE CONSERVATION MATTERS

There is a Committee for the Protection of the Environment which is consulted on all projects liable to have an impact on the environment as well as on the regulations designed and enforced by the Department for the Development of the Rural Economy (DIDER) and by the Department of Mining.

The Rural Development district offices (CIDER) are responsible for the management and development of protected areas and parks in their district.

PROBLEMS, NEEDS AND PROSPECTS

In the introduction the vulnerability of the natural environment of New Caledonia and its low adaptation potential was pointed out. The impact of human activities on the environment has therefore always been particularly destructive. For example:

- Before historic times, the inhabitants had neither iron implements nor machines, but their use of fire as a tool did a lot of damage. Captain Cook reported the widespread use of fire in the 18th century. In his time, the native forest had already been burnt down over large areas, particularly on the dry West Coast.

Bush fires still sweep through many parts of the island every year and remain the worst enemy of New Caledonia's nature. They gradually sterilise the soil, cause the wildlife to disappear, reduce environmental diversity, and eat into the rain forests causing them to recede year by year.

- The development of mining activities has also caused considerable damage, since it has led to the construction of numerous roads and tracks which facilitate access of vehicles and cut up the environment, denude large areas of land, and the dumping of "red sludge" down the hillsides whence it reaches the rivers and lagoon. These practices have also spoilt the appearance of the countryside to a considerable extent.

In Noumea itself, the presence of the SLN factory (Nickel refinery) gives rise to air pollution which is fortunately limited by the fact that the prevailing south-easterly winds blow the smoke away from the city, and sea pollution through dumping in the adjacent lagoon of the non-degradable waste products of nickel ore processing (slag). The urban nuisance from these factors is, however, more significant than the actual damage to nature.

- Forest exploitation (tree felling) used to be very destructive, particularly in the southern parts of the main island, and led to the disappearance of forests over large area.
- Increased urbanisation, notably in Noumea and surrounding areas has given rise to a number of nuisances: extensive occupation of land, sea and mangrove areas, visual pollution, air pollution (already referred to above), thermal, bacterial, particulate and chemical pollution of the lagoon.
- Poaching and irresponsible sampling by collectors also endangers certain animal and plant species. The unique Cagou, native parrots and pigeons, the flying fox, orchids and other rare plants are among these affected.
- Lastly, the lagoon itself is very sensitive to everything that happens on the main island and any forms of pollution occurring there will eventually affect it also. In addition, there is intense exploitation of lagoon fish, crustaceans and shellfish in some areas, particularly around Noumea.

Despite the threats that hang over New Caledonia's environment, the situation is far from disastrous, for three reasons: firstly, the population density is still low and the pressure on the natural environment

remains reasonable in most areas; secondly, the indigenous Melanesian population shows much respect for the natural environment and traditionally practises wise management of resources (except for the use of fires to clear the bush); thirdly, the Government, by appointing a Minister for the Environment, has recognised that a careful and active nature protection and pollution control policy was necessary for the development of the territory.

The hazards on which special attention should be focused in the coming years include those arising out of mining pollution associated with expansion of mining activities, and those connected with degradation of forest areas through an increase in tree felling for timber.

Because of the forthcoming political restructuring of the Territory and the new responsibilities that this will give to regional and customary authorities, there is a risk that local opportunistic decisions may be made to the detriment of the overall public interest. An instance of this can be found in the recent past, where forests were exploited by their customary owners without regard to genetic conservation techniques and without the Administration, which is in theory responsible for the management of these forests, daring to intervene for fear of causing political problems. And there have also been instances of politicians pressuring officers in charge of technical departments into authorising exploitation of forests that their predecessors had been wise enough to preserve for resource conservation or tourist development or simply for the establishment of new parks and protected areas.

It is not unrealistic to believe that the situation could be better, and even completely satisfactory, if certain actions were taken or emphasised. The following are suggested:

- Establishment of a separate Environment Office, to co-ordinate the various administrative bodies involved in environmental matters, and empowered to make inspections and proposals;
- Rehabilitation measures to repair, at least partly, the most serious damage done to the environment (replanting of land denuded by mining, sewage treatment in the urban area);
- Speeding up of measures already existing in connection with bushfire prevention, lagoon environment research, establishment of wildlife reserves, tightening of town planning regulations and impact studies, before launching major physical development projects, etc.
- Re-establishment of a strong Forestry Service, properly structured and centralised, for the conservation and management of the forest heritage, as well as for its protection. This Service must be capable of defending the natural forest and asserting its specific character, of making it clear that forestry laws do not replace ownership laws but complement the latter as a constraint for the public weal, and lastly, of carrying out a protective listing of the main forests of the Territory. In addition, it is essential that those local traditional communities whose rights to certain forests are recognised, be made aware of the value of the heritage they constitute and of the limitations that the need for long-term management of this heritage places on customary rights.

PART 2 - LISTS OF PROTECTED AREAS

A. Lands protected under the mining legislation1. Areas where mining activity is restricted

<u>Location</u>	<u>Surface Area (ha)</u>	<u>Reference</u>	<u>Date of Establishment</u>
Upper Dohio East Coast, Northern Section	7,000 89,400	72-397/CG 72-398/CG	17.08.72 "
Ponerihouen	33,880	72-399/CG	"
Amoa/Tchamba	43,000	72-400/CG	"
Paita/Dumbea/Mont-Dore	71,000	75-461/CG	13.10.75
Pouembout	35,800	75-462/CG	"
Koumac	26,300	75-463/CG	"
Boulouparis/Bourail	245,000	1847	07.07.81
Sailees-Neumeuni	650	1848	"
TOTAL	552,030		

2. Areas where mining activity is forbidden

<u>Location</u>	<u>Surface Area (ha)</u>	<u>Reference</u>	<u>Date of Establishment</u>
Basin of the Yahoue River	301	58-101/CG	26.03.58
Hot mineral springs of the Crouen River	400	58-102/CG	"
City of Noumea	3,700	58-103/CG	"
Part of Ducos peninsula	780	58-104/CG	"
Protected area around Poro	69	65-479/CG	11.09.65
Protected area on eastern branch of Caricouie River	600	68-338/CG	11.05.68
Protected area around Mont-Dore	3,500	72-461/CG	13.10.72
	9,359		
Areas totally protected under environmental legislation	21,140		

8. Terrestrial areas governed by environmental legislation
(Resolution No. 108 of 09.05.80)

<u>Location</u>	<u>Surface Area (ha)</u>	<u>Reference</u>	<u>Date of Establishment</u>	<u>Comments</u>
1) <u>Special fauna reserves:</u>				
Haute-Yate	6,855	184	03.02.60	Not including the area of the Territorial Park of Riviere Bleue listed hereunder.
Ilot Lepredour	760	985	12.09.41	
Ile de Pam	460	66-603/CG	19.12.66	
Aoupinie Mountain	<u>5,400</u>	234	14.11.75	
Sub-total	13,475			
2) <u>Special botanical reserves:</u>				
Mont Panie	5,000	931	07.07.50	
Mont Humbolt	3,200	"	"	
7 areas in the south	4,467	72-395/CG	17.08.71	Mining activity prohibited
Mont Mou	675	931	07.07.50	)included under)Mont Mou
Mont Do	300	)1847	07.07.81	(special
		) 295	05.08.83	(combined fauna (and flora re-serve
				)mining activity)prohibited.
Foret de Sailles	1,100	)1848	07.07.81	Mining activity
		) 295	05.08.83	prohibited
Pic Ningua	350	)1849	07.07.81	Mining activity
		) 295	05.08.83	prohibited
Sub-total	<u>15,092</u>			
3) <u>Strict nature reserves</u>				
Montagne des Sources (Dumbea River basin)	5,878	931 58-101/CG	07.07.50 26.03.58	Mining activity prohibited
Sub-total	<u>5,878</u>			
4) <u>Territorial parks:</u>				
Thy	1,133	931	07.07.50	
Riviere Bleue "M. Corbasson" Park	9,045	72-396/CG	17.08.72	Included in the Hte Yate special fauna reserve
	35			mining activity prohibited
	<u>10,813</u>			
TOTAL (1 + 2 + 3 + 4)	44,658			

C. Areas to be developed (with facilities)

<u>Location</u>	<u>Surface Area (ha)</u>	<u>Reference</u>	<u>Date of Establishment</u>	<u>Comments</u>
<u>Lands allocated</u>				
Ouenarou	1,171	59-483/CG	18.12.59	
Col d'Amieu	12,368	2042	08.09.70)	Hunting) restricted
Tiponite	1,085	"	"	(Hunting (prohibited
Tangadiou	1,016	"	"	) Hunting) prohibited (Not including (the special
Mont-Mou	4,363	139	11.01.71(	botanical (reserves. (Hunting (prohibited
Povila	) 600	2298	30.08.71	
	) 157	16 / CP	06.02.80	
Tango	29,089	3071	11.12.79	
Kuebini	) 58	2236	28.07.80	
	) <u>53</u>	2246	29.07.80	
Sub-Total	50,428			
<u>Afforestation areas</u>				
South	<u>4,665</u>	1304	05.05.80	
TOTAL	55,093			

SUMMARY TABLE OF TERRESTRIAL AREAS WHERE HUMAN ACTIVITY
IS RESTRICTED AND THE NATURAL ENVIRONMENT PROTECTED

<u>DESCRIPTION</u>	<u>Surface area (ha)</u>	<u>Reference</u>	<u>Percentage if main island</u>	<u>COMMENTS</u>
Mining activities restricted	552,030	Total \$A1	32.9	
Mining activities prohibited	9,359	Total \$A2	0.6	
Nature conservation areas	44,658	Total \$B	2.7	
Land to be developed (with facilities)	55,093	Total \$C	3.3	

D. Protected Marine areas

DESCRIPTION	Surface area (ha)	Reference	Percentage if main island	COMMENTS
Yves Merlet special reserve	16,700	244	17.07.70	)Same features)as for strict)nature reserve
Amédée Island special reserve	150	231	02.07.81	)Special fauna)and flora)reserve
Maître Island special reserve	600	"	"	)"idem"
Special rotating reserve	35,300	230	"	)Special marine)fauna reserve

NEW ZEALAND

PART 1: GENERAL REPORT

INTRODUCTION

New Zealand lies in the south-west Pacific between latitudes 34° and 48° South and longitudes 166° and 179° East. Its total land area is 268,046 sq km in two main islands (North and South) and other outlying islands, the biggest of which is Stewart Island off the southern tip of the South Island.

New Zealand is a young country geologically. One of the most striking physical characteristics is its mountainous nature. Less than one quarter of the land surface is below the 200 metre contour. Lying as it does in the "roaring forties" latitude, wind flow is generally from a westerly quarter in all seasons but this is further influenced by the mountainous terrain which extends from south-west to north-east through the length of the country. The mountains play a major part in rainfall distribution, which ranges between 600 and 1500mm a year for most of the country, but as little as 300mm falls in the rain shadow area of Central Otago with over 7,000mm in some areas west of the Southern Alps.

the mountainous nature of New Zealand produces a complex climatic pattern ranging from sub-tropical to sub-antarctic, from semi-arid to super-humid and from frost-free to sub-alpine and permanent snow and ice. These climatic differences are paralleled by vegetation differences including sharp tree limit boundaries which occur at progressively lower altitudes from north to south.

New Zealand is a geologically active country. Of the four North Island volcanic peaks of Egmont (Taranaki), Ruapehu, Ngauruhoe and Tongariro only the first can be classed as dormant. Other volcanoes include Mount Tarawera and White Island both of which have within the last 100 years, erupted with disastrous consequences. Closely connected with the volcanic system are many hot springs and geysers.

In keeping with the size of the mountains, New Zealand possesses a glacial system of some magnitude. In the North Island there are 7 small glaciers on the slopes of Mount Ruapehu, and there are more than 360 in the Southern Alps.

Owing to its high relief New Zealand rivers are mostly swift-flowing and difficult to navigate. As sources of hydro-electric power these rivers are of considerable importance.

By world standards, New Zealand's population is small - 3.2 million at the end of 1983. At the last 5 yearly census in 1981 279,084 of the total population classed themselves as Maoris and 88,824 as Polynesians. Nearly three-quarters of the population resides in the North Island with a large concentration in the Auckland area and over 80% of New Zealand's population is located in urban areas.

POLICY

New Zealand's formal establishment of protected natural areas dates from the early period of European colonisation in the latter half of the 19th century. The well-established practice of land protection has produced a comprehensive network of national parks and other protected areas, including more than 1,500 individual areas and extending over some 16% of the country's land area, on the mainland and on surrounding islands.

Critical examination of the protected area system, however, reveals a strong bias toward higher altitude and forested landscapes which inadequately reflect the true ecological diversity of New Zealand's natural environment. Lowland native forests, for example, are seriously under-represented in protected areas, yet they contain much of New Zealand's rare and endangered biota.

This ecological imbalance is the product of a land allocation process that has favoured the conversion of lowlands to farmland, and generally accorded protective status to areas lacking economic potential. Moreover, the protected area programme has been strongly motivated by aesthetic concerns and protected areas have generally lacked a systematic or scientific basis for their establishment.

During the past decade, however, there has been a remarkable shift in the philosophical basis for establishing protected areas, toward a greater emphasis on securing a truly ecologically representative system. This change in attitude reflects in part a response to initiatives occurring in the international nature conservation movement and in part a revitalisation of early efforts to establish widely representative reserves in New Zealand. But above all it signifies the growing influence of a scientific rationale for the establishment and management of protected areas.

There is now a clearly-expressed commitment by government and adequate legal provision, to protect what remains of lowland natural environments. One of the purposes of the Reserves Act is to ensure, as far as possible, "the survival of all indigenous species of flora and fauna, both rare and commonplace, in their natural community and habitats, and the preservation of representative samples of all classes of natural ecosystems and landscape which in the aggregate originally gave New Zealand its own recognisable character." Encouraging progress has also been made in developing the necessary procedural and information requirements for the country's conservation programme. The first is an inventory of all natural communities and landscapes in the country which merit protection. This must take account of the urgent need to evaluate those ecosystems which are threatened and rapidly diminishing. The second is a critical analysis of communities and landscapes in existing parks and reserves, with a view to assessing the adequacy of present ecological representation. In New Zealand progress is being made in meeting both these requirements.

To satisfy the first requirement, the Department of Lands and Survey is adopting an inventory approach in its regional land inventory scheme which produces single-factor maps and interpretive overlays to rank resources for various uses, including nature conservation. The scheme is a promising tool for identifying potential park and reserve areas.

Another major advance in improving the data base for natural resource protection is the recent establishment of a national Biological Resources Centre. The Centre has begun developing procedures for a national inventory of biological resources and for the evaluation of sites meriting protection. It is also promoting a programme of regional resource surveys using a recently developed national biogeographic scheme. About 80 ecological regions, based primarily on geology and landform, and over 200 second order ecological districts, based primarily on biological distribution patterns, have been identified. This scheme, the first of its kind in New Zealand, will be invaluable not only as a framework for assembling data for nature conservation purposes, but also as a reference against which to examine existing parks and reserves, and as a guide to the selection of new areas.

In a further attempt to satisfy the need for a comprehensive uniform checklist of resources in all types of protected areas, a "Register of Protected Natural Areas in New Zealand" (see Appendix 1 for example) has

been compiled, as a joint project of the Department of Lands and Survey, Forest Service and Wildlife Service. The Register is a milestone in improving understanding of the protected area system in New Zealand. While it adds little new information, it provides for the first time in one document a comprehensive summary of administrative areas, and systematically lists physical and biological features, including rare plants and animals, plus archaeological and historical information and evidence of human modification.

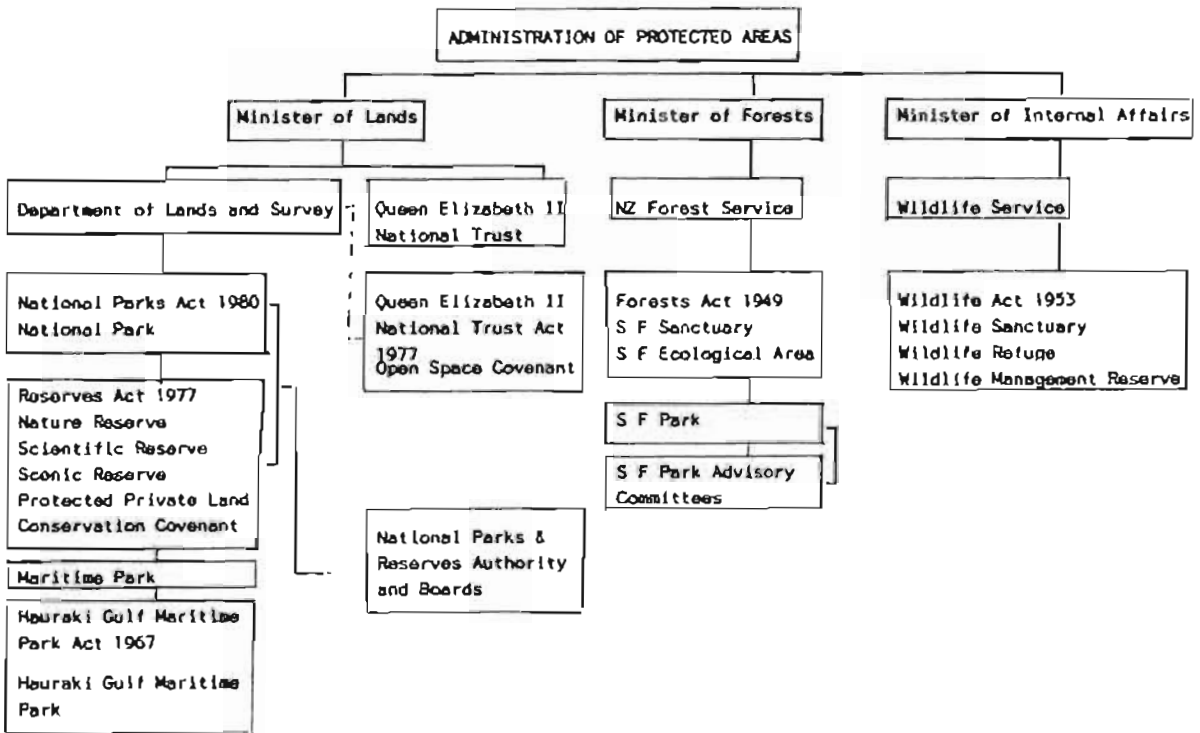
However, data in the register vary in quality, and there are gaps in the information available. Exposure of these deficiencies should stimulate increased research effort. Eventually the register will be computerised for better storage, retrieval and analysis of information. It will be an invaluable aid in objectively assessing the resources under protection.

LAW

The main pieces of legislation providing for the setting aside of land for public use, its administration, management and control are the Land Act 1948, the National Parks Act 1980, and the Reserves Act 1977. These acts are administered by the Department of Lands and Survey.

The Land Act, enables land owned by the Crown and foreshore areas to be reserved for any purpose (e.g. recreation, nature, scientific, scenic, historic) which is desirable in the public interest. The reserves are then administered in terms of the Reserves Act 1977. Crown owned land may be constituted national park in terms of the provisions of the National Parks Act 1980.

The diagram below illustrates the administrative structure for New Zealand's protected areas.



Other legislation related to conservation or the environment includes the Water and Soil Conservation Act 1967 which along with other Acts has established new regulatory and management responsibilities with increased emphasis on environmental protection and enhancement. The Forests Amendment Act 1976 provides for balanced use of State forest land and gives greater recognition of the protection of indigenous flora and fauna and recreational use of forests.

Today there are also greater opportunities for public involvement in decisions relating to conservation under these and other Acts (in particular the Reserves Act 1977 and the National Parks Act, 1980).

There are many considerations which play an essential role in a final decision on conserving a natural area. Such a decision is usually taken by individuals, government, council and committees which are not composed of ecologists. The seven criteria of:

- Representativeness - the basic criterion
- Diversity and pattern
- Rarity and special features
- Naturalness
- Long term viability
- Size and shape
- Buffering and surrounding landscape,

provide a primary assessment of a natural area's nature conservation value. It may be important to note other non-conservation values of a natural area; occasionally they may be used to select the area from among several otherwise similar in terms of the primary criteria. Examples of these secondary criteria are aesthetic and landscape value, and recreational use.

An example of the process which must be followed when establishing a protected area is outlined below as it applies to national parks.

It is one of the functions of the National Parks and Reserves Authority, the body responsible for policy matters relating to national parks, to consider and make proposals for the addition of land to national parks and establishment of new national parks.

The National Parks Act provides that the Authority may, after advising the Minister of Lands, request the Director-General of Lands to investigate and report to it on any such proposals. The Director-General is required to give public notice of the proposal, inviting persons and organisations to make written suggestions on it. The Minister of Energy is also to be advised of the proposed investigation.

Before making a recommendation to the Minister of Lands that land be added to a park, the Authority is required to consult the appropriate national parks and reserves board.

In considering additions to national parks, the Authority's responsibility is to assess the inherent suitability of land for preservation as national park. However, proposals for additions to parks or for new parks may sometimes have significant economic and/or social implications, and in requesting an investigation the Authority will seek information on such impact. In reporting to the Minister on the suitability of land for national park status the Authority will also inform him of the economic and/or social implications. The final decision made by the Governor-General in Council on the recommendation of the Minister can then be made in the light of the available information and on the basis of the national interest.

The following list provides details including the legislation for establishment of a protected area and the level of protection afforded for each of the 13 classes of protected areas in New Zealand. The whole network comprises 1,505 individual areas, extending over a total 4 million hectares. The two largest types of protected area, national parks and State forest parks, together account for more than two-thirds of all land under protection in New Zealand. (Note: New Zealand's protected areas are classified according to the classification system established by the IUCN. (Refer, IUCN "Categories, objectives and criteria for protected areas", Annex to General Assembly Paper, GA 78/24, (1978)).

National Parks in New Zealand generally satisfy the international principles of national park management established at the 10th General Assembly of the IUCN in New Delhi in 1969. They are preserved "for their intrinsic worth and for the benefit, use and enjoyment of the public" areas that contain "scenery of such distinctive quality and ecological systems or natural features so beautiful, unique or scientifically important, that their preservation is in the national interest". There is a legal requirement that native plants and animals be preserved and those that are introduced be eliminated, as far as possible. Subject to conditions necessary for the protection of natural features, members of the public have freedom of entry. Land can be excluded from a national park only by an Act of Parliament, so the security of status is extremely high.

National Park Specially Protected Areas may be established where a national park contains an area of special ecological or cultural significance in which the resources protected are particularly rare, endangered or vulnerable to disturbance, and must be strictly guarded from visitors. Such areas are created or revoked only by the Governor-General, and public access is by permit only.

Nature, Scientific and Scenic Reserves have as their principal purpose the protection and preservation of natural ecosystems in perpetuity. They all have the same degree of security with revocation of reserve status being by Gazette Notice following public notification and the hearing of objections. In detail, however, they differ with regard to permissible uses. In nature reserves, emphasis is given to unique habitats normally containing rare and endangered species of biota, where control of public access is essential to maintain the natural state and access is by permit only. Scientific reserves stress research and education values rather than strict nature preservation. Public entry is restricted only in special cases, while research and monitoring by scientists is encouraged and limited manipulation of the natural environment is permitted for approved experimental purposes. Scenic reserves are managed essentially according to the principle for national parks. Members of the public have freedom of entry and facilities may be provided for recreational activities compatible with ecological protection.

State Forest Parks and Other Protected Areas

State Forest Parks are multiple-use management areas aimed at facilitating public recreation in accordance with other purposes for which a forest is managed, including timber production and the protection of natural areas. Approaches to landscape protection may be more liberal than in national parks, and State forest park status can be revoked by Order-in-Council.

Forest Sanctuaries provide absolute protection for rare forest associations or fauna. Public access, while not prohibited, is strictly controlled; the highest possible security is afforded sanctuaries, since revocation of their status requires an Act of Parliament.

State Forest Ecological Areas are essentially scientific reserves set aside to protect rare habitats of forest flora or fauna, or representative forest ecosystems which maintain genetic diversity and are natural reference areas for ecological research and monitoring. Public access is normally unrestricted, though management has protection of the scientific values as its primary purpose. Revocation is by Gazette Notice, so their legal security parallels that of nature, scientific and scenic reserves.

Wildlife Reserves

Three types of reserves are intended specifically for wildlife protection. The Wildlife Sanctuary gives absolute protection to fragile wildlife habitats or rare and important wildlife species, which are highly susceptible to disturbance and must be protected from uncontrolled public visits. Sanctuaries can be revoked either by Proclamation or by Gazette Notice, so are accorded a relatively insecure status incompatible with their important protective role.

A Wildlife Refuge is a multi-purpose reserve protecting both native and introduced wildlife. It secures important habitat for protected native wildlife and also serves as a refuge for waterfowl during the game bird shooting season. At other times public access is usually unrestricted. Refuges can be revoked by Proclamation, and so require an additional reserve status to ensure their security.

Wildlife Management Reserves are intended to facilitate hunting and fishing and the public appreciation of wildlife. Public access is unrestricted and habitat manipulation is permitted. Revocation provisions parallel those for wildlife sanctuaries, so security of status is low.

Protection of Private Land

There are also three classes of protected areas that enable nature protection to be extended to freehold and leasehold land in New Zealand.

Protected Private Land is essentially a private protected area wherein the Crown, by agreement with the landowner, provides protection either in perpetuity or for a specified term. Public access provisions are also by agreement. Security of status depends on the nature of the agreement but agreements in perpetuity are binding on subsequent owners.

Conservation Covenants, administered by the Crown, and Open Space Covenants, administered by the Queen Elizabeth II National Trust, also provide for protection of natural values. They are legal contracts whereby the landowner voluntarily agrees that the land be managed to retain its natural or landscape character. Provision for public access, the degree of nature protection, and the duration of protective measures vary according to conditions in the covenant. Open space covenants can be binding on both existing and subsequent landowners.

New Zealand is a party to the Convention on Wetlands of International Importance (1975) and is to take steps to create reserves and otherwise protect its remaining wetland areas. Farewell Spit Nature Reserve and Waituna Lagoon Scientific Reserve are both registered under the convention. Consideration is also being given to establishing Biosphere Reserves (in line with an international UNESCO programme) which would preserve ecosystems rather than just individual species.

New Zealand is also a party to the Antarctic Treaty (1959), which has a basis of conservation and respect for the environment, with provision for Specially Protected Areas and Sites of Special Scientific Interest. The

government also believes that the treaty should govern any future exploitation of mineral resources in Antarctica.

New Zealand became a signatory in 1985 to the Convention Concerning the Protection of the World Cultural and Natural Heritage, popularly known as the "World Heritage Convention". The purpose of this convention is to set up a system whereby the international community can share in protecting those parts of the world's heritage which are of outstanding universal value. Consideration is now being given to making nominations.

Table 1 shows the number and extent of New Zealand's protected areas as at 31 March 1983.

TABLE 1 - Number and area of New Zealand's protected natural areas, by protective status class at 31 March 1983.

Protected Natural Area Class	No.	Area (ha)	%NZ Area
National Park	10	2,051,335	7.66
National Park Specially Protected Area	5	190,234	0.71
Nature Reserve	50	185,726	0.69
Scientific Reserve	36	6,802	0.03
Scenic Reserve	1,157	352,618	1.32
State Forest Park	19	1,638,603	6.12
State Forest Sanctuary	14	16,288	0.06
State Forest Ecological Area	52	96,952	0.36
Wildlife Sanctuary	13	209	-
Wildlife Refuge	52	14,666	0.05
Government Purpose (Wildlife Management) Reserve	94	9,570	0.04
Marine Reserve	2	2,959	-
Open Space Covenant	112	4,472	0.02
Protected Private Land	39	2,996	0.01
Conservation Covenant	5	12	-
TOTAL	1,660	4,573,442	17.08

TABLE 2 shows the classification of New Zealand's protected areas according to management objectives for protection and use.

New Zealand Protected Area Class	IUCN Conservation Management Class
National Park Specially Protected Area	Scientific Reserve
State Forest Sanctuary	Strict Nature Reserve
Nature Reserve	
wildlife Sanctuary	
National Park	National Park
Scenic Reserve	
Scientific Reserve	
State Forest Ecological Area	Nature Conservation Reserve/
Open Space Covenant	Managed Nature Reserve/
Conservation Covenant	Wildlife Sanctuary
Wildlife Management Reserve	
Wildlife Refuge	
State Forest Park	Multiple use Management Area/ Managed Resource Reserve

PARKS AND RESERVES ADMINISTRATION

With the passing of the National Parks Act 1980, a new structure was established for parks and reserves administration in New Zealand. While the administrative structure for national parks was altered, the basic philosophies of the National Parks Act 1952 were carried forward in the new Act and strengthened in some areas.

The National Parks Act 1980 sets out the purpose of parks as "preserving in perpetuity as national parks, for their intrinsic worth and for the benefit, use and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique or scientifically important that their preservation is in the national interest."

The Act provides that, having regard to those general purposes, national parks shall be so administered and maintained that:

- "they shall be preserved as far as possible in their natural state";
- "Except where the Authority otherwise determines, the native plants and animals of the parks shall as far as possible be preserved and the introduced plants and animals shall as far as possible be exterminated";
- "sites and objects of archaeological and historical interest shall as far as possible be preserved";
- "their value as soil, water and forest conservation areas shall be maintained";
- "subject to the provisions of the Act and such conditions as may be necessary for the preservation of the native plants and animals or the welfare in general of the parks, the public shall have freedom of entry and access to the parks, so that they may receive in full measure the inspiration, enjoyment, recreation and other benefits that may be derived from mountains, forests, sounds, sea coasts, lakes, rivers and other natural features."

These are the purposes for which national parks in New Zealand are established and managed and each proposal for their use is measured against the principles of the Act.

The legislation makes provision for higher degrees of preservation in defined areas of individual parks. These are known as Specially Protected Areas (formerly known as Special Areas) and may be established by the Governor-General on the recommendation of the Minister after consulting with the Authority and the appropriate board. Permits are required to enter Specially Protected Areas, e.g. one of which is referred to as the Takahe Area in the Murchison Mountains in Fiordland National Park.

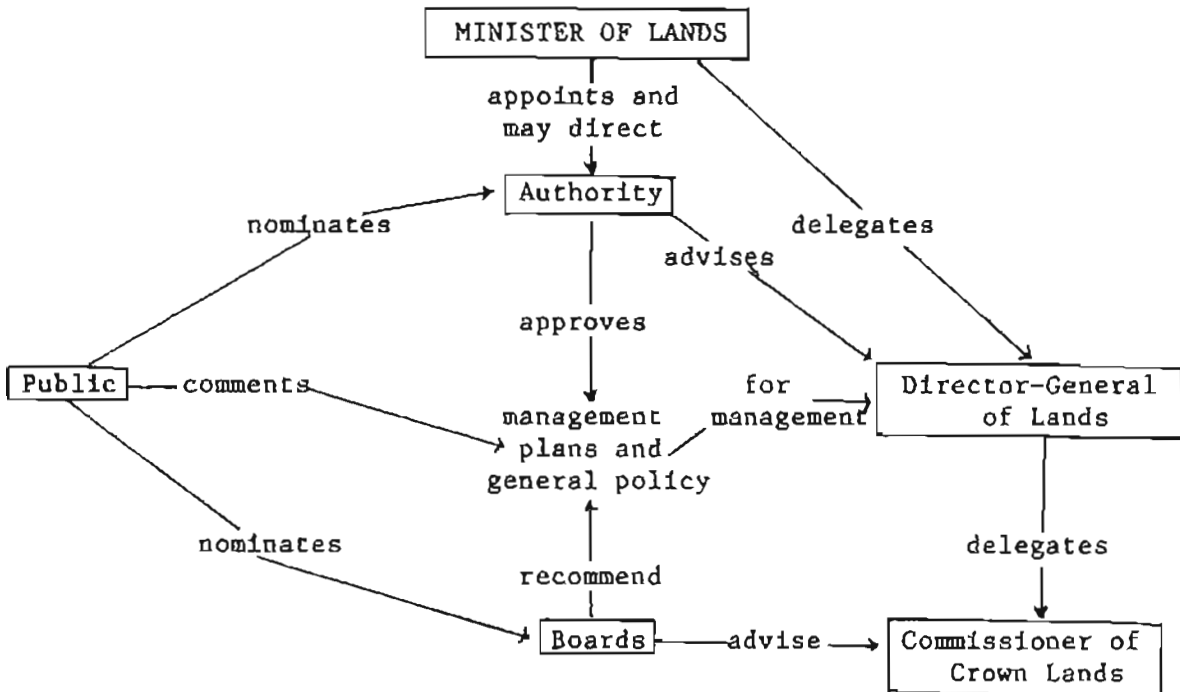
Just as Specially Protected Areas are designed to protect key natural features, so Wilderness Areas, also provided for in the Act are intended to preserve the quality of user enjoyment of nature. The Act provides for the Minister on the recommendation of the Authority to set apart any area of a park as a wilderness area and such an area then becomes subject to certain management constraints.

A new provision in the national park legislation is for the setting apart by the Minister, on the recommendation of the Authority, of areas of parks as amenities areas. Such areas recognise the development and operation of recreational and public amenities and related services for the public use and enjoyment of parks.

The National Parks Act 1980 provides for the first time, the framework for the integrated policy and management over New Zealand's major protected areas, whether they be national parks or reserves of national significance.

The new structure is basically three tiered. At the national level the National Parks and Reserves Authority has planning and policy oversight for national parks and has delegated responsibility under the Reserves Act 1977 for certain reserves. At the regional level the 12 National Parks and Reserves Boards have planning and advisory responsibilities for national parks and delegated responsibilities under the Reserves Act. The Authority and boards also have an important role in identifying gaps in New Zealand's protected area system and advising priorities for filling these gaps. The Department of Lands and Survey is then responsible for the day-to-day administration and management of the parks and reserves in accordance with general policy and management plans.

The flow diagram below shows the relationships between the agencies and their functions under the National Parks Act.



Addresses of offices responsible for administration of the protected area system

The Director-General of Lands
 Department of Lands and Survey
 Head Office Private Bag
 Wellington
 Ph: 735-022

The Secretary
 National Parks and Reserves Authority
 P.O. Box 2593
 Wellington
 Ph: 735-022

The Secretary
 Nature Conservation Council
 P.O. Box 12-200
 Wellington
 Ph: 735-022

Ministry of Agriculture and Fisheries
 Head Office
 Private Bag
 Wellington
 Ph: 720-367

Department of Internal Affairs (The NZ Wildlife Service and
 Head Office the NZ Historic Places Trust)
 Private Bag
 Wellington
 Ph: 748-699

Ministry of Works and Development (National Water and Soil
 P.O. Box 12-041 Conservation Organisation)
 Wellington
 Phone 729-929

The Director-General of Forests
 New Zealand Forest Service
 Head Office
 Private Bag
 Wellington
 Ph: 721-569

The Secretary
 Land Settlement Board
 Department of Lands and Survey
 Head Office
 Private Bag
 Wellington
 Ph: 735-022

Queen Elizabeth II National Trust
 Colenso House
 138 The Terrace
 Wellington
 Ph: 722-626

Royal Forest and Bird Protection Society of NZ Inc
 26 Brandon Street
 Wellington
 Ph: 726-254

LIST OF PROTECTED AREAS

Refer "Register of Protected Natural Areas in New Zealand", published by Department of Lands and Survey, Head Office, Private Bag, Wellington, New Zealand 1984. Sample pages covering protected areas on Banks Peninsula are attached (Appendix 1).

LIST OF PROPOSED PROTECTED AREAS

National Parks:

There are a number of investigations for new national parks and for additions to national parks currently underway. These proposals have been put forward by the National Parks and Reserves Authority or in some cases

by the former National Parks Authority. Examples of the areas currently being considered are:

The Haast Range: A proposed addition of some 27,000 ha to Mount Aspiring National Park. A report has been completed for the Director-General of Lands on the values of the natural, non-productive resources of the area. These resources have proved to be extremely important but will now need to be weighed against the potential agricultural uses for 1,655 ha of river flats contained within the proposal.

Waitutu State Forest: Proposed addition of some 45,000 ha to Fiordland National Park of indigenous lowland forest. In accordance with the procedure to be followed for establishment of a national park (refer under Section - "Law"), public submissions have been invited and the Director-General of Lands' final report to the Authority is nearing completion. Following this, the Authority will then make its recommendation.

Punakaiki: The proposed setting aside of some 30,000 ha of Crown land, reserves and State forest as national park. The Authority resolved at its meeting on 29 April 1985 to recommend to the Minister of Lands and to the Minister of Forests, that they recommend to the Governor-General that he declare the area to be national park. A formal recommendation and report is to be forwarded to the Ministers.

Wanganui River: A proposal to set aside approximately 81,000 ha as a national park to be centred on the Wanganui River. This area contains one of the remaining tracts of lowland forest in the North Island (92% of the proposed area is covered in native forest). This proposal is now awaiting a final decision by the government.

Other recently approved additions to existing national parks include a 43,000 ha southern extension to Nelson Lakes National Park, and 9,250 ha of State forest land to Tongariro National Park. A recent estimate of the total area under consideration for national park or for addition to national parks, is that it represents approximately 26% of the total area of New Zealand's 10 existing parks.

National Reserves

In 1982 the Minister of Lands approved criteria for identifying values of national or international importance in reserves which may warrant their being given special recognition as national reserves under the provisions of the Reserves Act 1977.

This status places a reserve in a prestigious group with national parks and an elite sample of the reserves system. The criteria, which were formulated by the National Parks and Reserves Authority after public consultation, provided that national reserves should be best examples of their kind.

The status is conferred by the Governor-General, in Council, acting on the recommendation of the Minister of Lands, and can be revoked only by Act of Parliament. Advice on appropriate candidates is now being obtained from all 12 local National Parks and Reserves Boards and the Authority and public submissions have also been invited by the Department of Lands and Survey.

The Authority considered that a desirable way to apply criteria in a manner which ensured representative coverage of the best examples of national and international values in reserves was a theme approach. Candidates are therefore being listed under the following groups:

Group: Recreation
 Themes: Lakes, Rivers, Maritime/Coasts, Mountains, Forests

Group: Historic
 Themes: Architectural Heritage (Maori and European), Discovery (Maori and European), Archaeological Heritage (Maori and European), Colonial Events.

Group: Nature
 Themes: National Heritage (Flora and Fauna), Natural Wonders, Islands (Outlying and Offshore), Wetlands.

The Authority believes that in order to maintain their prestige, national reserves should be few in number. The limit being considered at present is about 25, spread between the themes.

PROBLEMS, NEEDS AND PROSPECTS

Current conservation needs in New Zealand revolve around protected area identification, acquisition and management. With regard to identification, further inventory work and ecological research is needed to enable identification of those areas most requiring protection. Various specialist groups are now working toward this aim for example, the Wildlife Service's Fauna Survey Unit has almost completed a rapid nationwide habitat/wildlife survey. The Botany Division of the Department of Scientific and Industrial Research also undertakes scenic reserve surveys. In addition, Ecology Division, (DSIR) and university researchers frequently conduct scientific surveys. The Department of Lands and Survey has also been involved for many years in conducting coastal reserve surveys.

At present the inadequacy of the existing reserve system lies in the imbalance of high altitude terrain reserves against lowland forest reserves. The current "Protected Natural Areas (PNA) Programme" aims however to identify representative and priority areas for reserve acquisition. Already 4 pilot studies have been conducted in the Rodney, Motu, Mackenzie and Old Man ecological districts. The problem is that based on the limiting factors of staff and money, it has been estimated that the present PNA programme will take 20 years to complete a full coverage of the country. Within this time it is most likely a substantial depletion/ modification of New Zealand's natural areas (e.g. lowland vegetation) will occur. Further time must be allowed for negotiating with landowners regarding methods of achieving protection.

Today's protected area managers require even more than the inventory/resource information outlined. They need an understanding of ecosystem dynamics and relationships. There is also a need for the development of better management techniques.

The New Zealand conservation effort is, however, well advanced even though a great deal of work has yet to be done. The representative protected area network is being extended, new management techniques are being researched and information is being recorded in computerised form for ready retrieval.

In terms of educating the public about New Zealand's protected areas the Department of Lands and Survey produces pamphlets, for example, explaining about the PNA Programme, noxious weeds, and conservation in general. In addition, the National Conservation Week Campaign Committee, the Commission for the Environment and other government departments and non-government organisations do a great deal to promote conservation awareness. The Biological Resources Centre (as the country's biological resources co-ordinating centre) distributes a great deal of information. The National Film Unit is currently producing a series of films on New Zealand's sub-

antarctic islands for international distribution and in general the New Zealand public is becoming much better informed on environmental/conservation issues.

MAPS AND REFERENCES

For detailed locations of New Zealand's protected areas refer to the "Register of Protected Natural Areas in New Zealand" published by the Department of Lands and Survey, Private Bag, Wellington, New Zealand.

PART II: INFORMATION SHEETS ON PROTECTED AREAS

Because of the very large number of protected areas in New Zealand it is impractical to compile a comprehensive list for this publication. However, such a listing is available in the "Register of Protected Natural Areas in New Zealand" from which the appended example was obtained (Appendix 1).

FIG 25



Map No.	C gazetted Name	IUCN Cat.	Admin. Auth.	Dist/Cons. Gov.	Date	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-1 Port Hills Ecological District (continued)									
8	Buckley's Bay SR	IV	I.S	11	1955 1971	9.5	43°36'S 172°44'E *S84 091477	Steep stony face, volcanic bluffs and rounded tops, 2km E Lyttelton Andesite, basalt flows and debris, loess deposit on lumps Brown granular loam and clay, YG earth 114-335m 700mm 120 years of grazing and pasturing	Secondary light freeland of mahoe, ngaio, Coprosma spp. with much tree nettle and elderberry Herb and fern on steep rocks and bluffs with hounds tongue fern, leather-leaf fern, eastern orchid, shore asplenium, rautuia, Senecio saxifragoides and locally uncommon Myosotis australis Rank pasturated, some silver tussock Lianas common, uncommon plants present include the mistletoe Loranthus micranthus, leafless clematis and Olearia fragrantissima Rough grazing land with silver tussock, bracken and some gorse
10	Huon Hay SR	IV	Christ-church City Council	11	1912	17	43°37'S 172°30'E *S84 002455	Steep slopes on Port Hills Basalt, andesite and debris from old Lyttelton volcano Brown granular loam and clay 410-488m 810mm	Scattered Hill's totara/fuchsia/poppletree forest Fuchsia-lowland ribbonwood mixed broadleaved scrub on steep slopes Bracken fernland with NZ flax and regenerating lemonwood, fivefinger, Olearia, broadleaf Bullbird, St fantail, grey warbler present
11	Cass Peak SR	IV	Christ-church City Council	11	1914	3.2	43°38'S 172°37'E *S84 900432 891412	Slope on southwestern side of Cass Peak Basalt, andesite and debris erupted from the old Lyttelton volcano. Loess overlies gentle slopes Brown granular loam and clay 465m 900mm Area fenced in 1967, prior to this time severe stock damage	Only significant podocarp/mixed broadleaved forest remnant on Port Hills Matai-kahikatea/secondary mahoe-fuchsia mixed broadleaved forest Secondary fuchsia-coprosma-poppletree scrub Dracophyllum, Corokia, mingimingi, Senecio saxifragoides, snow tussock on steep rock bluffs Secondary bracken fernland regenerating to fuchsia, lemonwood at lower altitudes and to fivefinger, poppletree at higher altitudes Rough grazing land with silver tussock Bullbird, St fantail, silvereye, grey warbler present
12	Alhauri & Coopers Knob SR	IV	Christ-church City Council	11	1914	28	43°40'S 172°37'E *S84 981395 992402	Reserve runs along the outer top edge of the old Lyttelton volcano Basalt, andesite and debris erupted 2-3 million years BP. Numerous dykes. Graywacke derived loess overlies gentle slopes Brown granular loam and clay, upland and high country YB earth 427-573m 900mm Original vegetation burnt, surviving podocarps carry fire scars Area fenced in 1967, severe stock damage to undergrowth prior to this	Only significant podocarp/mixed broadleaved forest remnant on Port Hills Matai-kahikatea/secondary mahoe-fuchsia mixed broadleaved forest Secondary fuchsia-coprosma-poppletree scrub Dracophyllum, Corokia, mingimingi, Senecio saxifragoides, snow tussock on steep rock bluffs Secondary bracken fernland regenerating to fuchsia, lemonwood at lower altitudes and to fivefinger, poppletree at higher altitudes Rough grazing land with silver tussock Bullbird, St fantail, silvereye, grey warbler present

Map No.	Gazetted Name	IUCN Cat.	Admin. Auth.	Dist./Cons.	Date Cuz.	Area (ha)	Coor. Lat.	Coor. Lon.	Physical, Historical Features, Human Influence	Biological Features
57-1 Port Hills Ecological District (continued)										
13	Governor's Bay SR	IV	L&S	11	1951	0.10	43°37'S 172°39'E	172°39'E *S84 016447	Small gully at Governor's Bay, Lyttelton Harbour Deep redeposited loess with volcanic boulders YC earth to YB earth intergrade 9m 705mm	Emergent planted eucalyptus, some mahoe and many smothering vines and herbaceous weeds
14	Summer Head WR	VIII	IA	11	1959	3.0	43°34'S 172°47'E		Coastal cliff area bounded by MHW on seaward side and top of vertical cliffs on landward side, 7km E Christchurch 0-12m	Coastal scrub Breeding area for spotted shag White-fronted tern, red-billed gull present
15	Ahuriri Farms Ltd (A) OSC	IV	QEII	11	1983	87	43°42'S 172°35'E		Hillslopes on flanks of Port Hills, 17km S Christchurch 0-300m	Regenerating cut over podocarp forest Totara-matai-kahikatea-rimu dominants Several locally rare and endemic plant species including miro, fierca lancewood A number of plants at their distribution limits present such as the southern limit of akeake, tioki, kawakawa, NZ passion vine and the northern limit of <i>Olearia fragrantissima</i> Prolific bird life Silver tussockland with hard tussock Scrub absent Best remnant of tussock on the Port Hills
16	Ahuriri Farms Ltd (B) OSC	IV	QEII	11	.	40	43°42'S 172°35'E		Top of the Ahuriri hill block YC earth Light sheep (occasionally cattle) grazing, restricted to summer	
57-2 Herbert Ecological District										
17	King Billy Island SR	IV	L&S	11	1980	0.36	43°38'S 172°41'E		Small island in Lyttelton Harbour, surrounded by tidal mudflat Rhyolitic flow overlain by lava flows from Lyttelton volcano and coated with a thick mantle of loess YC earth 0-4.5m 880mm Rabbit, possum, sheep present	Exotic macrocarpa-eucalyptus A few ngalo and <i>Olearia</i> present Southern black-backed gull, NZ kingfisher nest on the island Penguin species, oystercatcher, red-billed gull present
18	Little Akaroa SR	IV	L&S	11	1959	0.40	43°41'S 173°00'E	*S84 319379	Steeply sloping valley side near Little Akaroa Bay, Banks Peninsula Reworked loess of some depth, with volcanic boulders and debris Lowland YB earth 25-45m 760mm Original vegetation removed, kanuka approximately 80 years old	Kanuka forest with occasional kowhai and broadleaved regeneration Mahoe, kawakawa and ground ferns, Akeake, ngalo, narrow-leaved houhere present A number of uncommon plants including the climbing <i>Scandia geniculata</i> , semi-lianous NZ spinach and <i>Isoetlylus microanthus</i> parasitic on ngalo and akeake

Map No.	Gazetted Name	UICN Cat.	Admin. Auth.	Dist/Cons.	Date Gaz.	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-2 Herbert Ecological District (continued)									
19	Sign of the Pack-Horse SR	IV	L&S	II	1914 1916 1923	105	43°42'S 172°42'E -584 06335+	On the upper southern face of Mt Herbert 11km SE Tailapu Young basalt of Mt Herbert lava flow, forming steep bluffy terrain in the upper parts of the reserve. Older lava and debris of the Lyttellon volcanic crater rim, upon which Mt Herbert has been built. Dyke outcrops present. Loose clothes gentle slopes Upland and high country YB earth, brown granular loam and clay 335-785m 1100-1250mm Area has been milled for podocarps Stone rishioua "Sign of the Packhorse" present on the reserve along a benched foot track, built in 1916 by H.G. Ell	(Matai-totara-kahikatea)/mahoe-narrow-leaved houhere-korihia mixed broadleaved forest Montane Hall's totara forest Montane broadleaf, fuchsia, fivefinger, lancewood, kohuhu, yellow-wood mixed broadleaved forest with some Hall's totara Secondary fivefinger-broadleaf-broadleaved scrub Secondary kanuka, Dracophyllum, Corokia, NZ flax, <i>Hebe laudiana</i> and blue tussock on rocky bluffs, with native herbs Cocksfoot hill pasture with fescue, silver tussock and brownloop (65.1ha) Bellbird, St fantail, NZ pipit, silvereye, yellow-breasted ill, gray warbler present
20	Herbert Peak SR	IV	L&S	II	1915	241	43°42'S 172°45'E -584 098358	Inside half of a large crescentic lava flow forming the top of Herbert Peak, steep slopes, steep valley head, many bluffs, Point on Banks Peninsula Basalt, loess on spurs and gentle slopes Upland and high country YB earth, brown granular loam and clay 335-918m 1525mm 120 years of grazing, fenced in 1965	Widest cross section of vegetation surviving on Banks Peninsula, including virgin forest Hall's totara/broadleaf-mixed broadleaved forest on upper slopes (43.6ha) Small stand of large Hall's totara on a flat topped spur (2.0ha) Mahoe-mixed broadleaved forest with occasional matai, totara and kahikatea on lower slopes and valleys (37.0ha) Secondary broadleaf, fuchsia, kanuka, mahoe dominated treelands (27.1ha) Fuchsia mixed broadleaved forest on upper cold slopes (13.2ha) Dracophyllum-Corokia-fivefinger scrub on upper rocky faces and spurs (4.8ha) Extensive NZ flax, <i>Olearia nummularifolia</i> , dracophyllum, snowberry on highest areas with subalpine herbs, broad-leaved bush tussock, silver tussock and hard tussock (17.0ha) All adult kawkawa that were in the forest have died within the last 10-20 years. Some young kawkawa alive in grassland NZ pigeon, bellbird, tuatua, yellow-breasted tit and brown creeper common

Map No.	Gazetted Name	IUCN Cat.	Admin. Auth.	Dist/Cons.	Date Gaz.	Area (ha)	Coor. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-2 Herbert Ecological District (continued)									
21	Mt Fitzgerald SR	IV	L&S	11	1907	44	43°42'S 172°50'E *SB4 180342	Small steep gully and bluffs on the central high ridge of Banks Peninsula Lava flow of andesite and basalt, loess covers gentle slopes Upland and high country YB earth 500-826m 1400mm Abundant possum, stock trespass	Secondary fuchsia-broadleaved forest in gully, narrow-leaved houhere, lemonwood, mahoe, lancewood and occasional Hall's totara (25ha) Secondary fivefinger scrub with mountain fivefinger, minor broadleaved species and Hall's totara regeneration Remnants of dense Hall's totara forest around upper edge Mountain holly-broadleaf-dracophyllum scrub on upper edges and rocks Senecio logopus, golden spaniard, Parakebe, filmy fern, Ourisia, forest violet on bluffs Bellbird, SI fantail, Australasian harrier, silvereye, yellow-breasted tit, grey warbler present
22	Hay SR	IV	L&S	11	1970	6.0	43°42'S 172°54'E *SB4 232348	Narrow alluvial valley running into Pigeon Bay on the northern side of Banks Peninsula, several indistinct terrace levels on valley floor Valley floor underlain by coarse boulder alluvium with a canopy of alluvial loess 25m 900mm Some logging of valley floor podocarps Exotic conifers and broadleaved trees planted around the northwestern and southern perimeters Bush was privately reserved by the Hay Family for many years, offered to the Crown in 1970	Best example of lowland alluvial podocarp/broadleaved coastal forest reserved in Canterbury Kahikatea-matai-totara/pokaka-lemonwood forest with kowhai, mahoe, titoki, fuchsia. Secondary mahoe-mixed broadleaved forest with good regeneration of broadleaved species and occasional podocarp regeneration Kanuka forest on the eastern valley wall with extensive mahoe and mapou regeneration
23	Kaituna Spur SR	IV	L&S	11	1915	23	43°43'S 172°46'E *SB4 116336	Sleep uppermost slopes in the eastern catchment at the head of Kaitauna Valley, Banks Peninsula Basalt with greywacke derived loess deposited on spur tops Brown granular loam and clay 520-730m 1250mm Frequent fire, cattle and sheep have had free access to the reserve until 1979	Hall's totara forest with broadleaf-mixed broadleaved understorey, original forest remnants Secondary broadleaf-fivefinger mixed broadleaved tree-land on upper slopes Secondary fuchsia-mixed broadleaved forest on the steeper slopes Bracken/brown-top-silver tussock hill pasture Hall's totara regenerating throughout Bluff vegetation of <i>Celmisia gracilenta</i> , <i>Senecio logopus</i> , patotara and the Banks Peninsula endemic <i>Hebe lauvaudiana</i> Bellbird, SI fantail, NZ pipit, silvereye, grey warbler, yellow-breasted tit present

Map No.	Gazetted Name	IUCN Cat.	Admin. Auth.	Date Cons.	Date Gaz.	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-2 Herbert Ecological District (continued)									
24	Morice Settlement SR	IV	L&S	11	1907	6.2	43°43'S 172°50'E *S84 174327	Steep gully, easy sloping hill at junction of Hikuiku Stream and two smaller streams, 6km NE Mito River, Banks Peninsula Loess and redeposited loess with andesitic and basaltic boulders YB earth to YB earth intergrade 250-305m 1000mm Logged over in places	Maioe-mixed broadleaved forest with lamonwood, fuchsia, kaikomako, lowland ribbonwood, lancewood, mapou, abundant lances and a number of tall emergent matai, totara and kahikatoe Marginal small-leaved Coprosma spp scrub Fern clad banks above deeply entrenched streams Bellbird, St fantail, Australasian harrier, silvereye, NZ pigeon, yellow-breasted til, grey warbler present
25	Mt Sinclair SR	IV	L&S	11	1915 1017 1979	— 62	43°41'S 172°51'E *S84 190328	Slopes and heads of three valleys on the southern side of Mt Sinclair, central Banks Peninsula Basalt and andesites of the Akaroa volcanics Loess clutches early slopes Brown granular loam and clay, upland high country YB earth 580-843m 1400mm 3.06ha gifted to Crown by Mr RD Hunt 3.5ha gifted to Crown by Mr CB Waghorn	Narrow-leaved snow tussock on upper slopes with mountain flax, <i>Dracophyllum acerorum</i> and golden spaniard Hall's totara/broadleaf-fuchsia-fivefinger forest (11.4ha). Fuchsia increases in importance along gullies NZ flax and mountain holly scrub on forest margins Recently dead kaikawaka present at bushline Bellbird, St fantail, St rifleman, grey warbler present
28	Glenralloch SR	IV	L&S	11	1973	6.9	43°43'S 172°52'E *S84 203337	Spu running NE from Mt Sinclair, Banks Peninsula Basalt and andesite of Akaroa volcanics overlain by loess on steeper slopes Redeposited loess and volcanic debris Brown granular loam and clay 600-700m 1150mm Gifted by Mr JB Hey	Small remnant of Hall's totara forest fringed with broadleaf-fuchsia-peppertree scrub Lowland ribbonwood with peppertree and Coprosma rotundifolia on a valley head shelf Ungrazed sweet vernal-browntop-cocksfoot pasture
27	Whatarangi Totara SR	IV	L&S	11	1978	4.7	43°44'S 175°52'E	Hillslope of Mt Sinclair, Banks Peninsula Andesite and basalt Brown granular loam and clay 55m 1400mm	(Totara-kahikatoe)/broadleaf-peppertree remnant forest

Mop No.	Gazetted Name	IUCN Cat.	Admin. Auth.	Dist/Cons.	Date Cons.	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-2 Herbert Ecological District (continued)									
28	Kaituna Valley SF	IV	L&S	11	1957	8.0	43°45'S 172°41'E *SB4 046302	Valley floor on southwestern side of Banks Peninsula Valley floor cut in lava flows and debris of the Akaroa and Lyttelton volcanics, with a loess coating on easier slopes Recent soil 15m 1000mm Original vegetation milled and burnt Many native trees (from NI stock) have been planted into reserve Excellent regeneration since fencing in 1957	Scattered surviving kahikatea-matai/secondary titoki-mahoe mixed broadleaved forest, with areas of pure tioki Secondary mahoe-broadleaved forest on margins Rank grassland with planted shrubs and NZ flax Bellbird, silvereye, grey warbler present
28	Hunter Native Forest PPL	IV	L&S	11	1976	8.0	43°38'S 172°43'E	Steep sided valley with a series of volcanic bluffs above Lyttelton Harbour Andesite and basalt overlain with loess YG earth 66-150m Number of planted native species foreign to the area (such as beech) Plants present from Canary Islands are owned by O Hunter	Secondary coastal scrub forest in gully: fuchsia, coprosma, mapou, kohuhu, lemonwood and mahoe Prostrate kowhai, Corokia on bluffs
57-3 Akaroa Ecological District									
30	Armstrong NR	I	L&S	11	1966	36	43°49'S 173°00'E *S94 313188	Crater rim of the old Akaroa volcano, and a steep main gully 4km SE Akaroa Andesite, basalt and debris flow, loess covering in places 485-813m 1400mm Gifted to Crown by the Armstrong Family Area grazed until reserved Possum common	Beech forest remnant, red beech with pockets of mountain beech on midslopes and dry knobs Broadleaf and mixed broadleaved forest in gullies, fuchsia common Snow tussock grassland with <i>Drocephylum acerosum</i> on rocky areas and snow tussock with kaikawaka on higher slopes Secondary mountain fivefinger-broadleaf-mixed broadleaved scrub on rocky areas in bush with <i>Astiella fragrans</i> and fern species Native herb and grass on rocky soil and bluffs including <i>Gingidia enysii</i> , <i>Hebe lauidiano</i> , <i>Celmisia mackaui</i> Type locality of 11 species first discovered by Raoul in 1840-1842

Map No.	Conserved Name	IUCN Cat.	Admin. Auth.	Dist/Cons	Date Gaz.	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-3 Akaroa Ecological District (continued)									
31	Dan Rogers Creek NR	I	I.&S	11	1963	0.9	43°52'S 172°57'E S94 288143	Coastal slopes and bluffs just inside the heads of Akaroa Harbour, 7 km from Akaroa 40m waterfall basalt and andesite flows with extensive boulders of welded pyroclastic debris 0-225m 635mm Cutly has been burnt several times	Secondary coastal forest with maioe-pigeonwood-kawakawa with some nikau on colluvial bluffs. Southern limit of nikau in the South Island Extensive cliff vegetation, including 9 species of fern, mountain flax, bush flax and endemic daisy <i>Celmisia mackoul</i> , undescribed <i>Poa</i> spp and other native grasses <i>Coprosma propinqua</i> - <i>C. crassifolia</i> /exotic grassland on sunny faces NZ flax/exotic grassland Exotic grassland dominated by sweet vernal and brome Bellbird, St fantail, southern black-backed gull, red-billed gull, spotted shag, grey warbler present
32	Montgomery Park SR	IV	I.&S & Wairarapa County Council	11	1968	25	43°45'S 172°52'E S94 207298	Outcrops of Akaroa crater and steep slopes above summit road. Lava bluffs, steeper slopes consist of blocky alluvial detritus, gentler slopes are covered with greywacke loess YG earth to YB earth Intergrade 450-670m 1150mm Most of the original forest cleared and burnt last century Part SR, part council reserve, part recreation reserve	Mahoe-mixed broadleaved forest with fuchsia, lowland ribbonwood, fivefinger, narrow-leaved houtere, broadleaf, lemonwood, mapou, lancewood and occasional matai, Hall's totara and totara Mountain holly, broadleaf, hebe, fuchsia, bush flax and NZ flax scrub on bluffs and rocks with small patches of karelu, prickly shield fern and Richard's shield fern on rocks Bracken/hill pasture with scattered regeneration Bellbird, brown creeper, St fantail, grey warbler present
33	Otepetolu SR	IV	I.&S	11	1930 1953 1970	15 23 2 40	49°45'S 173°01'E S94 336298	The rim of Akaroa volcano, two steep valley heads, a spur between and some prominent bluffs 15-25m tall Andesite and basalt, loess deposited on gentle slopes Brown granular loam and clay 550-750m 1250mm Much of the original Hall's totara forest cut and burnt	Hill's totara forest with regular broadleaf on slopes (11.5ha) Secondary mixed mountain broadleaved forest with mountain fivefinger, broadleaf, lemonwood, fuchsia, coprosma and frequent Hall's totara regeneration (11.2ha) Fuchsia dominated broadleaf forsis on valleys and concave slopes, some mountain holly, putaputaweta and broadleaf (7.3ha) Light grassland (sweet vernal, karelu) on rocky soil with establishing shrubs, <i>Helichrysum bellidioides</i> and NZ flax common Bellbird, St fantail, St rifleman, yellow-breasted fl, grey warbler present

Map No.	Cazetted Name	IUCN Cnt.	Adm. Auth.	Dist/ Cons.	Date Gaz.	Area (ha)	Coor. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-3 Akaroa Ecological District (continued)									
34	Okuti Valley SR	IV	L&S	11	1917 1932	4.3	43°47'S 172°50'E *S94 173251	Old terrace above the Okuti stream. 4km SE Little River. Banks Peninsula Underlain with Akaroa andesite and basalt, topping of loess and alluvial boulder clay YG earth to YB earth intergrade 90-150m 1000mm Original vegetation milled and burnt 4-5 rimu trees from Tennyson Inlet were planted in the reserve in 1970 All rimu were removed from Banks Peninsula last century	Secondary mahoe-mixed broadleaved forest: kanuka and lianes throughout, scattered secondary totara, malet and kahikatea Tall kanuka forest with subcanopy of mahoe, kowhai, lemonwood, kohuhu, mapou, narrow-leaved houhere and totara Small wet hollow of niggerhead with some kahikatea Excellent regeneration of totara and matai Rich bird life: bellbird, SI fantail, NZ pigeon, silvereye, grey warbler present
35	Eilangowan SR	IV	L&S	11	1973	7.9	43°48'S 173°02'E *S85 & 95 351230	Rocky spur and ridge crest on hills behind Akaroa Basalt, andesite and pyroclastics of the Akaroa volcano, a dyke forms the high bluff Greywacke loess on gentler slopes Brown granular loam and clay 610-685m 1150mm Frequent fire, last burnt in 1971 Gifted by Messrs JWF and CH Moore	Secondary fivefinger-broadleaf-fuchsia, mixed broadleaved scrub and forest with regenerating Hall's totara Hall's totara-broadleaf-fivefinger-fuchsia-mixed broadleaved forest with a few solitary red beech Coprosma-fuchsia-koromiko scrub Rock bluff vegetation including narrow-leaved snow tussock, endemic Hebe lauvudiano, broad-leaved bush tussock and Senecio lagopus Bellbird, SI fantail, shining cuckoo, grey warbler present
36	Te Oka SR	IV	L&S	11	1917	12	43°49'S 172°48'E *S94 144220	Very steep hillslope S Little River. Banks Peninsula Massive lavas of the Akaroa volcanics with many outcrops, thickly coated with greywacke derived loess on gentle slope Brown granular loam and clay 305-490m 1000mm Original vegetation destroyed by fire, some podocarps survived	(Totara-matai-kahikatea)/mahoe-fivefinger-kowhai-lemonwood mixed broadleaved secondary forest in gully (6.3ha) Kanuka forest with mahoe-mixed broadleaved species regeneration on steep convex slopes Brecken fernland Bellbird common Brown creeper, SI fantail, silvereye, grey warbler present

Map No.	Gezatted Name	U.T.N. Cat.	Admin. Auth.	Dist/ Cons.	Date Gaz.	Area (ha)	Geog. Lat.	Physical, Historical Features, Human Influence	Biological Features
57-3 Akaroa Ecological District (continued)									
37	Peraki Saddle SR	IV	I.&S	11	1890 1900	41 34 74	43°40'S 172°51'E *S94	Reserve in two parts on either side of the mtl Akaroa crater rim, Banks Peninsula Basaltic and andesitic lava flow slopes, steep debris slopes, gentle slopes are loess mantled Brown granular loam and clay, upland and high country YD earth 245-730m 1270mm	Best stand of surviving podocarp forest on Banks Peninsula Matai-totara-kahikatea/mahoe-mixed broadleaved forest on a spur Secondary kanuka treeland with regenerating firefinger and lauroxwood (Hall's totara-matai)/mahoe-mixed broadleaved forest on lower slopes (20.1ha) (Hall's totara)/fuchsia-mixed broadleaved forest on upper slopes (18.7ha) Brownlop-(silver tussock) hill pasture (23.1ha) Snow tussock and native herbs on bluffs Good Hall's totara regeneration Bellbird, brown creeper, SI fanail, NZ pipit, silvereye, grey warbler present
38	Magnet Bay SR	IV	I.&S	11	1917	19	43°50'S 172°46'E *S94 115199	Steep valley wall with bluffs in Magnet Bay Valley, Banks Peninsula Akaroa basalt and andesite underlie the area with outcrops on stream bed and valley wall bluffs. Thick deposit of greywacke loess on gentle slopes YD earth 75-275m 88mm Original vegetation removed by fire last century Possum and stock damage to understorey has occurred	Secondary mahoe-ngalo mixed broadleaved forest with surviving matai, totara, littok, mapou, kohuhu, kowhai, akeake, fuchsia, lemonwood common Secondary kanuka scrub on bush fringes Coprosma and Cassinia scrub around margins Phymatosorus, Cheilanthes, Colulahaastii and Vittadinia on bluffs and outcrops
39	Devils Gap (or Gate) SR	IV	I.&S	11	1898	49	43°50'S 172°50'E *S94 173190	Flat spur, gully and walls beneath a spectacular volcanic outcrop Andesitic and basaltic flows, Nevils Gap formed by a large intrusion (dyke) Gentle slopes coated in greywacke loess on southern part of Banks Peninsula Brown granular loam and clay, upland and high country YD earth 225-490m 1150mm Low altitude tussock grassland has originated from early Polynesian fires	Only extensive low altitude narrow-leaved snow tussock area on Banks Peninsula (on flat spur) with <i>Dracophyllum acerum</i> , NZ flax and kanuka Old secondary mahoe-mixed broadleaved forest with some surviving kahikatea, matai and totara in the valley, treefern common Secondary kanuka treeland with bracken and regenerating broadleaved species

Map No.	Gazetted Name	IUCN Cat.	Admin. Auth.	Dist./Cons.	Date Gaz.	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-3 Akaroa Ecological District (continued)									
40	Peraki Bay SR	IV	L&S	11	1980	19	43°51'S 172°49'E 594 163174	Middle of a steep valley wall, Peraki Bay Valley, Banks Peninsula Basaltic and andesitic lava flows and debris of Akaroa volcanics, overlain by loess on gentle slopes Brown granular loam and clay, YG earth 213-275m 100mm	Mahoe-mixed broadleaved secondary forest with kowhai, kaikomako, narrow-leaved houhere and a few surviving matai and totara Secondary kanuka tree-land Extensive <i>Helichrysum</i> and <i>Coprosma</i> scrub Silver tussock and pasture Bellbird, silvereye present
41	Carew's Peak SR	IV	L&S	11	1898 1978	35 32 67	43°51'S 172°52'E 594 204175	Deep gullies and gully heads, small volcanic outcrops and bluffs Andesites and basalts with loess on gentle slopes Brown granular loam and clay, upland and high country YB earth 305-670m 1100mm Much of reserve burnt in middle of last century, free stock access until 1975 Possum common 31.7ha donated by Mr Simes	Secondary mahoe-mixed broadleaved forest with narrow-leaved houhere, broadleaf, lemonwood, lancewood, kowhai, mapou and a few surviving matai and Hall's totara on lower slopes Upllope: Hall's totara, tuchsia are more common, Hall's totara regenerating freely Secondary kanuka tree-land Secondary bracken, gorse, coprosma scrub Silver tussock, narrow-leaved snow tussock NZ pigeon, bellbird, St fantail, St rifleman, silvereye, grey warbler abundant
42	Long Bay SR	IV	L&S	11	1898	14	43°52'S 172°52'E 594 205158	Very steep gully terminated by a 50m vertical lava bluff with waterfall, Banks Peninsula Andesite and basalt, volcanic debris on steep slopes, easier slopes overlain with loess Brown granular loam and clay and YG earth 115-245m 900mm	Secondary mahoe-mixed broadleaved forest with pale, pulaputaweta, kowhai, akiraho and narrow-leaved houhere on valley slopes Secondary young <i>Coprosma</i> spp scrub with weeping mapou and regenerating broadleaved species Fringing kanuka tree-land Cocksfoot- <i>Rytidosperma</i> pasture with some silver tussock Broad-leaved bush tussock around the waterfall A number of interesting plants including the threatened force lancewood and <i>Teucrium parvifolium</i> Bellbird, St fantail, NZ kingfisher, silvereye, NZ pigeon, grey warbler present

Map No.	Gezified Name	IUCN Cat.	Admin. Auth.	Dist/ Cons. Guz.	Date	Area (ha)	Geog. Loc.	Physical, Historical Features, Human Influence	Biological Features
57-3 Akaroa Ecological District (continued)									
43	Wainui SR	IV	I&S	11	1954	0.03	32°40'S 172°54'E *S94 234224	<p>Druid elevated valley in the Akaroa crater</p> <p>Andesite and basalt overlain with a heavy deposit of glacial loess</p> <p>YG earth to YB earth in fragment</p> <p>135-150m</p> <p>1000mm</p> <p>Area has suffered from stock damage, not regenerating after having been fenced</p> <p>Plantings of <i>NI Pitiosporum</i> into reserve</p>	<p>Secondary mahoe-kowhai-kaikamako mixed broadleaved forest</p> <p>Remnant kahikatea and matai forest</p> <p>Rare cocksfoot-Yorkshire fog pasture</p> <p>Brown creeper, bellbird, Californian quail, grey warbler present</p>
44	Te Oka Bay WR	VIII	IA	11	1970	0.20	43°52'S 172°47'E	<p>Steep and rolling hill country with occasional gullies, narrow strip of shingle beach 3km in SE</p> <p>Christchurch on Banks Peninsula</p> <p>Basalt overlain in places with loess</p> <p>0-152m</p> <p>Lack of sufficient control over habitat</p>	<p>Introduced pasture grass</p> <p>Manuka shrubland in gullies</p> <p>Breeding ground of white-flipped penguin</p>
45	Palm Gully PPL	IV	I&S	11	1970	18	43°52'S 172°58'E *S94 284140	<p>Extremely steep gorge in the sheer bluffs at the entrance to Akaroa Harbour</p> <p>Easy spurs above bluffs, ledges, rocky slopes, waterfalls</p> <p>Andesite, basalt and debris flows of the Akaroa volcanics with occasional dykes</p> <p>Brown granular loam and clay</p> <p>0-335m</p> <p>635mm</p>	<p>Best coastal remnant on Banks Peninsula</p> <p>Mahoe/kawakawa forest with about 80 nikau</p> <p>Akeake-ngaito-mahoe mixed broadleaved coastal scrub</p> <p>Banks Peninsula endemic: <i>Colinusio</i> mockaii, mountain foxglove, <i>Carex irijifila</i> on wet, shady bluffs, rocks and ledges</p> <p>Leafless clematis, threatened <i>Anogramma leptophylla</i>, <i>Hebe louviana</i>, climbing NZ spinach, prostrate kowhai, <i>Hebe strictissima</i> on sunny faces</p> <p>Coastal turf of iceplant, sand primrose, shore groundsel, bog-rush on coastal edges</p> <p>Bellbird, shining cuckoo, SI fantail, southern black-backed gull, red-billed gull, NZ pigeon, rock pigeon, NZ pipit, grey warbler present</p>

NORTHERN MARIANA ISLANDS

PART 1. - GENERAL REPORT

The Commonwealth of the Northern Mariana Islands (C.N.M.I.) comprises all the islands of the Marianas chain except Guam. The islands extend roughly between latitudes 14°N to 21°N and longitudes 145°E to 146°E, extending over a North-South distance of about 440 miles. The CNMI consists of sixteen islands, having a total combined area of approximately 510 square kilometres (see Map 1).

Of the 16 islands in the CNMI, only 6 are regularly inhabited (Rota, Saipan, Tinian, Anatahan, Alamagan and Agrihan). Based on the most recent census which was conducted in 1980, the total population of the CNMI is approximately 20,000. Over 87% of the population live on Saipan, 7.5% on Rota and 5% on Tinian.

The concept of protected areas and conservation policies are recent issues in the CNMI which were precipitated by various factors resulting from the commercial and industrial developments encouraged by the CNMI in its effort to become economically self-reliant. Impacts on the present resources of the CNMI are being felt as a result of the diverse requirements needed to maintain and foster economic growth. Realising this, the CNMI government has promulgated policies which would mitigate adverse impacts on its fragile resources.

With regard to specific laws or decrees dealing with conservation and protected areas, Article XIV, Section 2, of the Constitution of Northern Mariana mandates that the island of Managaha be maintained uninhabited and used only for recreational and cultural purposes. It further mandates that the islands of Sariguan and Maug be maintained uninhabited and used only for the preservation of fish, wildlife and plant species. Public Law 1-8, Chapter 13, Sections (a) (b) (c) (e) (f) empowers the Department of Natural Resources to protect and enhance the Northern Mariana Islands natural resources (wildlife, aquatic, forest, marine environment). Public Law 2-51 establishes the Division of Fish & Wildlife within the Department of Natural Resources and mandates this Division to provide for the conservation of fish, game and endangered species. This law empowers the Division of Fish and Wildlife to acquire areas or access for the protection of fish and wildlife resources.

These two public laws basically empower the Department of Natural Resources and the Division of Fish and Wildlife respectively to promulgate regulations for the protection of natural resources, specifically plants and wildlife. Regulations are promulgated through administrative procedures by these agencies.

PART II: INFORMATION ON PROTECTED AREAS

LIST OF PROTECTED AREAS

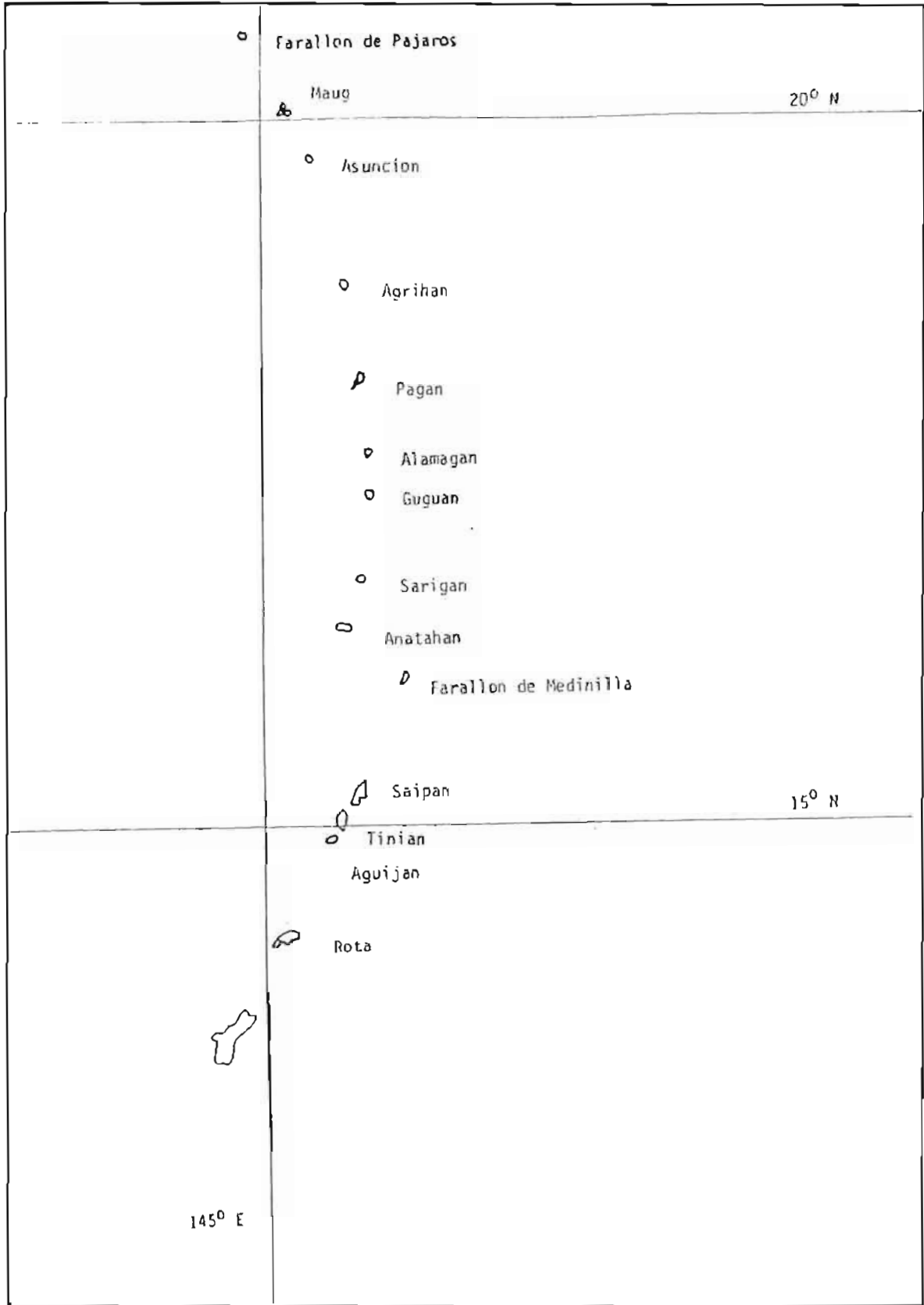
<u>NAME</u>	<u>SIZE</u>	<u>LEAD AGENCY</u>	<u>CATEGORY</u>
Sariguan	500 Ha.	Dept. of Natural Resources/ Division Fish & Wildlife	Scientific/ Strict Nature Reserves
Guguan	412 Ha.	Dept. of Natural Resources/ Division Fish & Wildlife	Scientific/ Strict Nature Reserves
Maug	205 Ha.	Dept. of Natural Resources/ Division Fish & Wildlife	Scientific/ Strict Nature Reserves
Managaha	N/A	MPLC	Multiple use Management Area

LIST OF PROPOSED PROTECTED AREAS

<u>NAME</u>	<u>SIZE</u>
Asuncion	722 Ha.
Mt. Tapotchau	317 Ha.
Uracas (Farallon de Parjaros)	202 Ha.
Naftan Pt.	195 Ha.
Kagman Peninsula & Forbidden Is.	105 Ha.
Bird Island Reserve	90 Ha.
Tinian	
Rota	
Managaha Underwater Marine Parks	
Rota Underwater Marine Parks	
Tinian Underwater Marine Parks	

THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

M.P. 1.



PALAU

INTRODUCTION

The Republic of Palau is comprised of a group of islands located at 6°53' to 8°12' North and 134°08' to 134°44' East and about 741.27 kilometres east of Mindanao (see Map 1). There are about 350 islands in the Republic with Babeldaob Island the largest (see Map 2). It is about 332.82 square kilometres while the smallest of the group is only a few square metres.

The island group comprises four major types of islands; volcanic, limestone, low platform reef and atoll. The Republic is encircled by a barrier, fringing and patch reefs with inner and outer reef flats. The barrier is approximately 451.10 kilometres in length encompassing a lagoon with an area of about 1,449.36 square kilometres.

The Republic has a maritime tropical rainy climate characterised by minimal seasonal changes. Diurnal temperature change is about 10 degrees Fahrenheit of the mean (81 degrees Fahrenheit) with January and February being the coolest months with a mean of 80 degrees Fahrenheit.

Rainfall is plentiful making the islands fertile. There are nine months of heavy rainfall and three months of moderate rainfall. The driest months are from February to April with rainfall of about 6 to 8 inches each month. The rainfall for the rest of the year is about 10 to 20 inches with the maximum in the month of July.

The 1980 census carried out by the U.S. Bureau of Census showed that the Republic of Palau had a total population of 12,116, of which 6,279 were males and 5,837 were females. These figures included both Palauans and foreigners residing in the Republic in that census year. Of the total population, 54.7% were between the age of 15 and 64. This is considered an economically active age-group.

Koror State, smaller than Babeldaob Island, is the most populated. It is the capital for the Republic and is the most economically developed. For this reason population migration to Koror for job opportunities, medical purposes, education, etc, has caused over-population on this small island.

The government of the Republic of Palau is a constitutional democracy which was installed in January of 1981. It has three branches: Executive, Legislative and Judiciary. The President, elected for a four-year term by popular suffrage, is the chief executive assisted by the Vice-President, also popularly elected by the people.

The Vice-President, also Minister of State, is among the five ministers serving as cabinet members. The other four ministers are appointed by the President with advice and consent of the OEK Senate and serve at the will of the President.

The Legislative Branch is a bicameral legislature consisting of Senate and the House of Delegates. There are 14 Senators representing the six (6) senatorial districts and 16 Delegates each representing each state in the Republic. Members of the National Congress (Olbiil Era Kelulau) are elected for a four-year term.

The Judiciary Branch consists of a unified court system made up of a Supreme Court (with trial and appellate divisions), National Court and a Court of Common Plea. The Chief Justice is the Administrative Officer for the unified court system.

POLICY

The Constitution of the Republic of Palau clearly states in its Article VI the policies of the National Government. Among those policies is the conservation of a beautiful, healthful and resourceful natural environment.

LAW

The following are the basic details of the legislation dealing with conservation and protected areas:

Palau Code, Chapter 2

- Section 200 - Control of the Rhinoceros Beetle.
- Section 201 - Ngerukewid Islands Wildlife Preserve.
- Section 202 - Conservation of Birds.
- Section 203 - Conservation of Dugong.
- Section 204 - Transport of Monkeys.
- Section 205 - Protection of Marine Life.
- Section 206 - Palau Fish and Game Commission.
- Section 208 - Prohibition of Fishing in Ngerumekaol during Spawning Seasons of Groupers.

Trust Territory Code Title 45, Chapter I

- Section 1 - Fishing with Explosives, Poisons, Chemicals, etc.
- Section 2 - Limitations on Taking of Turtles.
- Section 3 - Control of Sponges.
- Section 4 - Control of Pinctada Margaritifera (black-lip mother-of-pearl oyster shell).

Trust Territory Code Title 45, Chapter 2

- Section 51 - Harvesting restricted, Trochus.

Republic of Palau Public Law

- RPPL No. 1-30 - Trochus Harvesting in Restricted Areas.
- RPPL No. 1- 9 - Prohibition of Clam Meat Export.
- RPPL No. 5-6-5 - Palau Lagoon Monument.
- RPPL No. 1-58 - To provide for the protection and enhancement of environmental quality....
- RPPL No. 1-48 - To repeal PL No. 6-6-68, and to abolish the Palau Historical and Cultural Preservation Commission, to create a Palau Historical and Cultural Advisory Board....
- RPPL No. 4C-78 - Provide for the Protection of Environmental Quality.
- RPPL No. 7-19 - Extending Powers of Environmental Quality Protection Board covering the...protection of all plants and animals of the island on land, water, and in air....

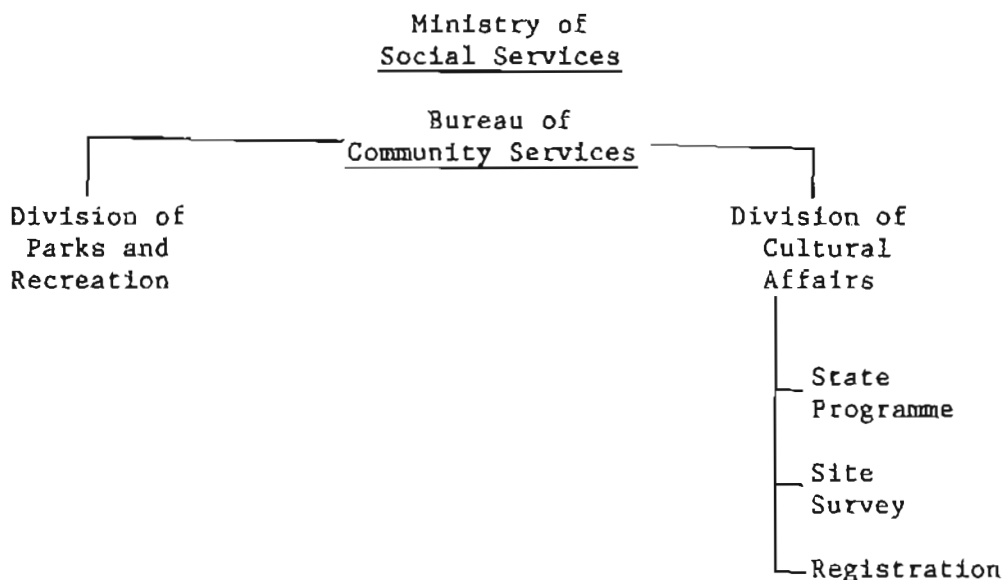
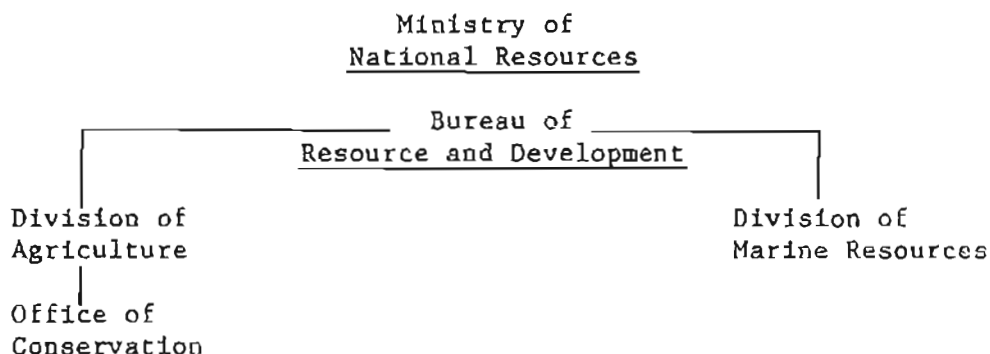
Koror State Ordinance

- Ordinance No. 150-69 (48-69) - Establishment of Trochus Breeding Sanctuaries....
- Ordinance No. 49-1969 (157-69) - Prohibition of Shelling.

PARKS AND RESERVES ADMINISTRATION

Management of parks and recreation areas and historical sites fall under the Bureau of Community Services in the Ministry of Social Services while that of conservation areas falls under the Bureau of Resources and Development in the Ministry of National Resources. Enforcement of the laws pertaining to these areas remains with the Bureau of Public Safety in the Ministry of Justice.

The flow charts below show details of administration for preserved areas.

Parks and Historical SitesConservation Areas

ADDRESSES

For further information on parks and historical sites:

Attn: Minister of Social Services
Chief, Division of Cultural Affairs
P.O. Box 100
Koror, Republic of Palau 96940

For information on conservation areas:

Minister of National Resources
Attn: Conservation officer
P.O. Box 100
Koror, Republic of Palau 96940

LIST OF PROTECTED AREAS

The conservation areas include Ngerukewid, Ngerumekaol, and trochus breeding sanctuaries. Ngerukewid Islands, including the surrounding waters, reef and underwater were designated by the Trust Territory Government as a wildlife preserve. Ngerumekaol Channel also became a preserve by the same conservation law but only from April 1 to July 31 every year. This is the spawning ground for groupers.

Trochus breeding sanctuaries are protected under different laws of different states and enforcement of such laws are the responsibility of each state.

Following is the list of Historical and Cultural Landmarks that have been identified.

<u>Name of Sites</u>	<u>Locations</u>
1. Ongewikl Yars	Ulong Is., Koror State
2. English Men's Cave	Ulong Is., Koror State
3. English Men's Beach	Ulong Is., Koror State
4. Yapese Stone Money	Omis Cave, Koror State
5. Ngeremdiu Cannon	Ngeremdiu Is., Koror State
6. Japanese Crematorium	Iebukl Hamlet, Koror State
7. Light House	Malakal, Koror State
8. Rock Paints (White Cliff)	Ngerukdabel Is., Koror State
9. Ngerkebesang Terraces	Ngerkebesang, Koror State
10. Ngetrur Well	Ngerbeched, Koror State
11. Kodellii Dock	Ngerchemai, Koror State
12. Food Supply Warehouse	Ongelungel Is., Koror State
13. Underground Shelter	Okerd, Koror State
14. Beduu 'l Yaes	Beduu Is., Koror State
15. Yii 'l Malk	Ngerukdabel Is., Koror State
16. Mechang Dock	Ngermid, Koror State
17. Spanish Landing Site	Iebukl, Koror State
18. Shinto Shrine Site	Ngermid, Koror State
19. Sea Plane Ramp	Ngerkesbesang, Koror State
20. Gun Emplacement	Mdealaii, Koror State
21. Ngermelei Monolith	Ngermid, Koror State
22. Klou 'l Mariar	Ngerukdabel Is., Koror State
23. Kekerei 'l Mariar	Ngerukdabel Is., Koror State
24. Ngeremdiu Gun Emplacement	Ngeremdiu Is., Koror State
25. Metuker a Bisch	Ongelungel Is., Airai State
26. Ngeberdel Cave	Ngerusar, Airai State
27. Iyechaderngel	Ngchemyangel, Aimeliik State
28. Ngerkeai Village (old)	Aimeliik State
29. Ucherderar	Imul, Aimeliik State
30. Ouballang	Imul, Aimeliik State
31. Bai ra Tulau	Ngchemyangel, Aimeliik State
32. Malsol Tomb	Flechui, Aimeliik State
33. Terulekebil	Ngchemesed, Ngaremlengui State
34. Bai Ra Orukei	Imeong, Ngaremlengui State
35. Ngerutechei	Imeong, Ngaremlengui State
36. Omeroel Bad	Imeong, Ngaremlengui State
37. Stone Stairway	Ngchemesed, Ngaremlengui State

<u>Name of Sites</u>	<u>Locations</u>
38. Rock Construction	Imeeong, Ngaremlengui State
39. Ngeremlengui Cannon	Ngermetengel, Ngaremlengui State
40. Oroel Bad	Mengellakl, Ngarchelong State
41. Ngarubau Fort	Ngarbau, Ngarchelong State
42. Badrulechau	Mengellakl, Ngarchelong State
43. Ngcheyangel Bair	Ngerdilong, Kayangel State
44. Ngerchokl	Ngkekklau, Ngaraard State
45. Tuchelliaur Tomb	Ngebuked, Ngaraard State
46. Oltall	Ellab, Ngaraard State
47. Bedul a Tmeloched	Ellab, Ngaraard State
48. Demad le Chelid	Ellab, Ngaraard State
49. Terriid	Ellab, Ngaraard State
50. Obechad re Techikebai	Ellab, Ngaraard State
51. Kingellel a Uodelchad	Ellab, Ngaraard State
52. Ngkekklau Stone Causeway	Ngekekklau, Ngaraard State
53. Ngirngemelas Tomb	Ngiwal Staqte
54. Ngibtal (Sunk Village)	Ngiwai State
55. Imeyns 'l Bad	Ngellau, Ngiwal State
56. Tedeb el Ngot	Ngerang, Melekeok State
57. Ibesachel	Melekeok, Melekeok State
58. Oyang el Madedok	Ngeburch, Melekeok State
59. Orewiki 'l Ngark	Ngerdok, Melekeok State
60. Olkeok 'l Bad	Melekeok, Melekeok State
61. Edesir a Rsuul	Melekeok, Melekeok State
62. Bloody Nose Ridge	Negesias, Peleliu State
63. Wild Cat Monument	Ngerchol, Peleliu State
64. Wild Cat Monument	Ngesias, Peleliu State
65. Ngemululau Bai	Ngerdelolk, Peleliu State
66. Olkael Cave	Ngesias, Peleliu State
67. Medaladebii	Ngerchol, Peleliu State
68. Termetet Tomb	Ngerbelau, Angaur State
69. Yii 'l Temekai	Ngermasech, Angaur State

The Republic of Palau does not have a range of categories under which all preserved areas fall, but the following are in existence.

- | | | |
|-------------------------|------|---|
| 1. Wildlife Preserve | .... | Ngerukewid Islands |
| 2. Protected Landscapes | .... | Ngerkebesang Terrace, Kamyangel Terrace |
| 3. Resources Reserves | .... | Ngerumekaol Channel States' trochus sanctuaries |
| 4. Natural Landmarks | .... | Caves, Beaches, Wells, Springs. |
| 6. Historical Preserves | .... | (see listing). |

LIST OF PROPOSED PROTECTED AREAS

Since the Palau Historical and Cultural Advisory Board has not been established, all the sites on the listing are still at the identification stage, except those that have been accepted by the National Register.

PROBLEMS, NEEDS AND PROSPECTS

According to a survey done by Mr Scott Russell, Director of the Office of Preservation at the Headquarters in Saipan, the Division of Cultural Affairs, which is responsible for the preservation of historical sites, is still experiencing some problems that need urgent attention.

MAPS AND REFERENCES

There are no maps for the identified sites, however there is a hope to have all the sites surveyed and mapped in the near future.

PART II: INFORMATION SHEETS ON PROTECTED AREAS

NAME OF PROTECTED AREAS

Since detailed studies have not been carried out on each site except Baira-Airai, the following listing of identified sites has been provided.

MANAGEMENT CATEGORIES

Since Palau became a Republic in 1981 exercising authority over preservation of historical sites, there has been a lull in the programme as evidenced by Mr Russell's survey. Nothing has really been done except the identification of sites.

The following sites were nominated in 1976 to SHPO.

- | | |
|-------------------------|---------------------------------|
| 1. Spanish Landing Site | Iebukel, Koror State |
| 2. Shinto Shrine | Ngermid, Koror State |
| 3. Malsol Tomb | Elechui, Aimeliik State |
| 4. Badrulechau | Mengellakl, Ngarchelong State |
| 5. Ngeremlengui Cannot | Ngermetengel, Ngaremlenui State |
| 6. Airai Bai | Airai, Airai State |
| 7. Meteu 'l Klechem | Melekeok, Melekeok State |
| 8. Odalmelech | Ngerang, Melekeok State |
| 9. Sea Plane Ramp | Ngerdis, Koror State |
| 10. Gun Emplacement | Medalail, Koror State |
| 11. Ngermelei Monolith | Ngermid, Koror State |
| 12. Old Man by the Sea | Elechui, Aimeliik State |
| 13. Ongeluluul | Melekeok, Melekeok State |
| 14. Kamyangel Terrace | Kamyangel, Aimeliik State |

The following sites were nominated by SHPO for inclusion in the U.S. National Register in early 1976. On September 30 of that year they were accepted by National Register. They are all associated with Palauan Culture.

1. Airai Bai
A council house built on a village stone platform where such structures have been for years. It is the last of its kind left in Palau and is still being used by the community.
2. Meleu 'l Klechem
This is an octagonal monolith about 2.13 metres in length and .61 to .91 metres in width.
3. Odalmelech
This is a monolith associated with the village diety of Melekoek.
4. Ongeluluul
This is a somewhat delapidated stone platform where war strategies were formulated. Similar sites are found throughout Palau.
5. Kamyangel Terrace
This is one of the several puzzling physiographs of man-made earthworks found in Palau. They are puzzling because Palauan legends do not reveal a clear indication of their uses or time of construction, although Osborne has suggested that the shreds of pottery found about the area indicated they are "relatively late".

Ngerukewid Islands, under the management of the Conservation Office, became a wildlife preserve through the Trust Territory of the Pacific Islands Conservation law. Section 201 of the Trust Territory Code designates

Ngerukwid Islands and their surroundings as a conservation area, while section 208 of the same code designates Ngerumekaol Channel as a reserved area only from April 1 to July 31 of each year. Both areas are under the management of the Conservation Office.

There are several trochus breeding sanctuaries in Palau. Establishment of such areas are under the laws of the states. Koror State has six such sanctuaries: Uchelbeluu, Ngederrak, Lukes, Udel, Ngermongimd and Rebotel.

LEGAL PROTECTION

Historical preserved areas are under the protection of the Chief of the Division of Cultural Affairs. Ngerukewid Islands and Ngerumekaol are under the protection of the Conservation Officer, and parks and recreation areas are under the protection of the Chief of the Division of Parks and Recreation. Trochus breeding sanctuaries are under the protection of the governors of each state.

Enforcement of laws related to these areas, except trochus sanctuaries, is the responsibility of the Bureau of Public Safety in the Ministry of Justice.

DATE ESTABLISHED

Ngerukewid Islands and Ngerumekaol Channel became conserved areas through TTPI Public Law. Koror State trochus sanctuaries became conserved through Koror Municipal Ordinance 150-69 (48-69) which took effect on June 9, 1969.

Some of the historical preserved areas were identified by the previous Palau Historical and Cultural Preservation Commission which was established by Public Law 6-6-18. Republic of Palau Public Law 1-48 abolished the Commission, and in its place established Palau Historical and Cultural Advisory Board. At the time of writing the Board has not been installed.

GEOGRAPHICAL LOCATION

Ngerukewid Islands are bounded by the grid co-ordinates 91 and 94 and by 18 and 22 on sheets 1043 I SW and 1043 II NW on Army Map Service Series W856. It is about 18.53 southwest of Koror State.

Ngerumekaol Channel is about 17.50 kilometres east south east of Koror State and about 1.7 kilometres north north east of Ngerukewid Islands.

Historical preserves are scattered throughout the Republic and no details of geographical locations for each have been done.

ALTITUDE

The highest altitude in the Republic of Palau is about 242.01 metres above sea level, therefore all sites fall within that altitude. Unfortunately, there is no detailed information on each site.

AREA

There are no detailed measurements for each site.

LAND TENURE

Most of the historical sites are either privately owned or clan owned with few exceptions such as bays, docks, trochus santuaries, Ngerukewid Islands and Ngerumekaol Channel.

PHYSICAL FEATURES

Again, there are no detailed studies for each area. However, since the Republic of Palau is only about 453.25 square kilometres with the highest elevation above sea level about 242.01 metres, precipitation, temperature, humidity and seasonal changes are similar from end to end with slight diurnal changes.

The minimum daily temperature is 75.1° Fahrenheit and the maximum is 86.8° Fahrenheit. The annual mean temperature is 80.9° Fahrenheit with the mean annual rainfall as 3.76 metres.

VEGETATION

Vegetation is primarily undisturbed forest and varies very little between the high volcanic islands and the low platform ones. Coconut and breadfruit trees are common to all islands. Detailed vegetation studies for each site remain to be done, but in general, the above description applies.

NOTEWORTHY FAUNA

Noteworthy fauna include dugong, blue whales, spermwhales, crocodiles, hawkbill sea turtles and green sea turtles. Giant clams became a conserved species on August 2, 1981 under Republic of Palau Public Law 1-9.

All birds in the Republic are protected by section 202 of the Trust Territory Code except *Gallus gallus*, *Porphyrio porphyrio*, *Kakatoe galerita* and *Halcyon chloris*.

CULTURAL HERITAGE

Some of the historical cultural sites are man-made and some are natural. The majority of them have something to do with traditional Palauan culture. A number are associated with Spanish, German and Japanese administrations. Several sites are associated with World War II and a few have to do with the Europeans' arrival in Palau in 1783.

LOCAL POPULATION

Villages are scattered throughout Palau and most of these cultural sites are within walking distance. Those on the rock islands are only a few minutes away by boats. Some of the sites are still being used by village people today.

Most of the people living about the areas are semi-self-sufficient, small-village-type people. This is with the exception of Koror State, the seat of the National Government.

CONSERVATION MANAGEMENT

Since there is no Chief Conservation Officer in the Republic nothing is being done to implement management plans. The only person currently with that office is a scientific illustrator.

ZONING

Zoning exists only in Koror State in accordance with the Koror Master Plan, Koror Zoning Law and Koror Subdivision Law. The Koror Planning Commission enforces these laws.

The purpose of the Commission is to provide guidelines for zoning purposes. Such guidelines include provisions for adequate open spaces between buildings for light and air, to prevent undue concentrations of populations, to conserve and protect the natural environment, to assure adequate space for community facilities and utilities, and to encourage the

most appropriate use of land, both private and public. Zoning programmes in Koror State have been strictly for the development of infrastructures.

The rest of the states have yet to formulate their own zoning laws.

DISTURBANCES AND DEFICIENCIES

Occasional burning occurs, but nothing much is destroyed. The only threat to preserved sites is from major infrastructure development. Agriculture encroachment is not a problem at present; however, it will become so as population increases.

The only problem is poaching. There are people who constantly poach on the conserved areas irrespective of the laws. It is the only major concern of the government, but law enforcement is very inadequate so poaching persists.

SCIENTIFIC RESEARCH

The only scientific research paper on a single particular area was published in 1984 by James Carucci and was prepared for the Palau National Museum, Inc. and the Division of Cultural Affairs. It is entitled Archaeological Survey of the Bai-Ra-Irrai.

Other information could be obtained from the following surveys:

SNYDER, D.:

July 1983 Archaeological Survey in Ngardmau and Ngchesar, Republic of Palau.

BUTTLER, B.M.:

July 1984 A Preliminary Report on the 1983 Archaeological Survey of Aimeliik State, Republic of Palau.

For additional information contact the following:

The Chief
Division of Cultural Affairs
Republic of Palau
P.O. Box 100
Koror, Republic of Palau 96940

SPECIAL SCIENTIFIC FACILITIES

There are two laboratories in the Republic of Palau. One is for marine scientists and the other is shared by the Office of Conservation Management and the Entomological Office. Both laboratories have only the basic equipment for work and studies. They are not equipped to handle detailed analysis of artifacts and marine life.

The only available housing for scientists is at the Marine Resource Centre and it is usually reserved for marine scientists. However accommodation is often available for other scientists on contract to the Republic of Palau.

PRINCIPAL REFERENCE MATERIAL

The following references could be consulted for more information. It should be noted that all of these sources do not give detailed information on any of the specific sites identified in this paper.

APPLE, R.A.

1972 Micronesian Parks. Saipan, Mariana Islands, Trust Territory of the Pacific Islands.

BALLENDORF, D.A.

1976 Historic and Cultural Preservation in Micronesia. *Micronesian Reporter* 23:13-17.

CHAPMAN, P.S.

1968 Japanese contribution to Micronesian Archaeology and Material Culture. In: *Prehistoric Culture in Oceania*. I. Yawata and Y.H. Sinoto, Eds. Honolulu: Bishop Museum Press.

HIDIKATA, H.

n.d. Stone Images of Palau (English translation of an article entitled Report on the Consecrated Stone Images and other Stone Works in Palau, Micronesia. In: *The Japanese Journal of Ethnology* December, 1956, (Thomas B. McGrath, S.J. Ed., English Translation). Micronesian Area Research Centre, Publication No. 3, University of Guam.

HISTORIC PRESERVATION STAFF

1976 Historic Preservation in Micronesia. Saipan, Mariana Islands, Trust Territory of the Pacific Islands.

KANESHINO, S.

1958 Land Tenure Patterns, Trust Territory of the Pacific Islands, Volume 1. Office of the High Commissioner, Trust Territory of the Pacific Islands.

STAFF

There are no individuals regularly working in the area. The Bureau of Public Safety within the Ministry of Justice enforces laws for these areas. Unfortunately, the Bureau is short of manpower so law-enforcement for these areas is very inadequate.

BUDGET

There are no separate budgets for the divisions responsible for the protected areas. Their funds are included in the budgets for their parent Bureaus.

Additional funds for the year 1985 are US\$3,000 from the South Pacific Commission for the recording of Oral History and US\$63,000 from U.S. National Park Fund to the Division of Cultural Affairs through the Palau National Museum as Contractor. These funds are expended according to the terms of the contract.

LOCAL ADMINISTRATION

For historical preserved areas write to:

Minister of Social Services
Attention: Mr Moses Sam
P.O. Box 100
Koror, Republic of Palau 96940

For conservation areas write to:

Minister of National Resources
Attention: Conservation Officer
P.O. Box 100
Koror, Republic of Palau 96940

DETAILED MAPS

Mapping of the areas is still in the preliminary stage, however, it is likely that outside expertise will be undertaking the mapping in a short time.

FURTHER INFORMATION

Aside from Bai-Ra-Irrai site all the sites in the Republic are still being mapped and researched. Again the process is still in its preliminary stage.

• KAYANGEL

BABELDAOB

URUKTHAPEL

PELELIU

ANGAUR

• SONSOROL

• PULO ANNA

• MERIR

• TOBI

▷

0 100km



0 5 km



Eil Malk

PAPUA NEW GUINEA

INTRODUCTION

Papua New Guinea is comprised of the largest islands in the South Pacific. It includes many small islands, and has a total of 42,840 square kilometres. The interior part of the country is very mountainous, the highest point being Mount Wilhelm (4,350 metres) in the central highlands. It contains a wide range of habitats from tropical lowland rainforest to areas with seasonal snow and ice. Within these habitats there is a great diversity of animal species.

The country has an equatorial climate. Temperatures range from means of 22°C to 31°C. The annual rainfall is high and generally over 2,500 millimetres. The highland areas are cooler, whilst the lowlands and the coast are hot and humid.

About 97 percent of the total land area of Papua New Guinea is still held under the customary land tenure and although the customs and systems of tenure vary, they all have certain common characteristics.

Papua New Guinea has 700 different languages and a very diversified culture. People are classified as Melanesians. The total population at the last census in 1980 was just over three million (3,010,727).

Most of the people still live in rural areas and depend on a subsistence way of life. People live on staple foods such as sago, taro, kaukau, sweet potatoes, fish and pigs. Both fishing and hunting are often important in the subsistence economy.

The monetary section of the country's economy is based on agricultural cash crops (coffee, cocoa, coconuts, oil palm, rubber and tea). Other income comes from mineral resources such as copper and gold.

The country became self-governing in 1973 and fully independent in 1975. On 16th September 1985, Papua New Guinea will celebrate its 10th Anniversary of Independence.

POLICY

The Office of Environment and Conservation, now the Department of Environmental Conservation (DEC), was established in 1974 as the direct result of the Fourth Goal laid out in the National Constitution of Papua New Guinea:

"4. Natural Resources and Environment -

We declare our fourth goal to be for Papua New Guinea's natural resources and environment to be conserved and used for the collective benefit of us all, and be replenished for the benefit of future generations."

The constitution was adopted by the First National Parliament as the work ideal for the administration of PNG by a democratic political process.

Shortly thereafter the National Parliament adopted an Environment and Conservation Policy presented by the DEC. This policy was subsequently published by the DEC as a brochure to be made available to potential developers: "Papua New Guinea: Environment and Conservation Policy: A Statement of Principles".

The structure of the Department of Environment and Conservation directly reflects the functions of the Fourth Goal, as elaborated in the National Constitution.

The Constitution called for:

	<u>Division</u>
"(1) Wise use ... of natural resources and environments ... in the interests of our development ... for future generations .."	Environmental Planning and Protection
"(2) .. conservation and replenishment for ourselves and posterity .. for"	National Parks
"(3) ... protection to all our valued birds, animals, fish, insects, plants and trees."	Wildlife

Thus the constitutionally stated policies of our government are directly served by three DEC Divisions listed above. Since the creation of a new Department of Environment and Conservation early this year, Water Resource Bureau has been placed under the DEC.

In order to implement these policies a number of Acts have been passed by successive National Parliaments:

<u>ACT</u>	<u>Responsible Division</u>
(1) Environmental Contaminants Act 1978 Environmental Planning Act 1978	Environment Planning and Protection
(2) Conservation Areas Act 1978 National Parks Act 1983	National Parks
(3) Crocodile (Trade and Protection) Act rev. 1982 Fauna (Protection and Control) Act 1974 International Trade of Endangered Species of Fauna and Flora Act 1979	Wildlife

LAWS

Papua New Guinea legislation which has direct or indirect implication on conservation and protected areas is outlined in Appendix 1. The Acts are to be found in the "Revised Laws of Papua New Guinea 1975". This is a uniform compilation of all the Acts of Parliament and their revisions, passed up to 16 September 1975, with the addition of amendments and Acts passed subsequently.

Laws which deal directly with establishment of protected areas in Papua New Guinea are Fauna (Protection and Control) Acts, National Parks and Conservation Areas Act.

The Acts are all administered by the Department of Environment and Conservation. The Acts dictate the establishment of various protected areas.

A. Fauna (Protection and Control) Act 1966

This Act has the following aims:-

1. protection of endangered species.
2. declaration of areas as wildlife sanctuary.
3. establishment of wildlife management area.

The Act basically protects certain species of wildlife considered to be endangered. However, laws do allow certain species to be harvested by Papua New Guineans using traditional hunting methods for customary or non-commercial purposes.

All wildlife in a sanctuary are protected except for certain specified species which can still be hunted. However, in protected areas the reverse procedure is followed whereby certain specified fauna are protected and harvesting of other types of wildlife is allowed.

Wildlife Management Areas (WMA) can be declared only at the request of landowners and are a means of assisting customary landowners to control wildlife resource exploitation. The Act provides for the declaration of WMA's and this entails the establishment of committees to make rules, name the WMA, and prepare boundary descriptions. The Committee is empowered under the Act to enforce the rules within the specified boundary. If the rules are broken, people can be taken to court. Rules are established to control, protect and propagate fauna in the WMA's. The rules are usually formulated by the traditional landowners. Most are ecologically sound in terms of the protection they provide the fauna and habitat.

The three types of protected areas outlined above can be established on customary owned land. This allows for local or grass-root public participation or involvement in the conservation of their own wildlife. The effectiveness of such protected areas seems to depend on how comprehensive the regulations are and how well they are enforced.

B. Conservation Areas Act, 1978

The objective of this Act is to provide a principal means of conserving certain areas of PNG for future generations. Through this Act any place of special value for a group of people whether it is a beautiful and scenic place, building, a breeding ground for birds and animals, shipwreck, historical site, or place of traditional significance can be declared Conservation Area. To do so does not affect the ownership of the land but rather provides for the creation of a local management committee which has responsibility for the preparation of a management plan for the area.

The Act also allows for the establishment of protected areas on public and traditionally owned land and public participation is important in having such areas declared for protection. The Act has not yet been implemented because of a lack of funds and its potential effectiveness has still to be realised.

C. National Parks Act, 1982

The objective of this Act is to uphold one of the directive principles of the 4th National Goals of the Papua New Guinea Constitution which states:

"the conservation and replenishment, for the benefit of ourselves and posterity of the environment and its sacred, scenic and historical qualities."

The Act went further in translating its objective and it states that this is:

"to provide for the preservation of the environment and of the national cultural inheritance by -

the conservation of sites and areas having particular biological, topographical, geological, historical, scientific or social importance."

The Act covers a range of different areas and types of protected areas under one piece of legislation. Although there are a number of different categories of parks in Papua New Guinea these are not listed or explained in the Act. This lack of specific criteria allows some flexibility in establishing parks and to some extent with the preparation of management plans.

The Act also allows for public participation. The fact that the majority of the land is traditionally owned, means that any attempt to secure land for protective purposes requires investigation, negotiation and consultation.

The above three Acts do not have provision for public participation. However, because 97% of the land is traditionally owned any attempt to secure land for conservation and protection purposes requires investigation, negotiation and consultation with the people. The people must be fully informed of any proposal otherwise any attempt towards protection of wildlife and its habitat will fail.

Currently, there are several ways in which information can be channelled through the Department of Environment and Conservation for the identification of suitable areas to be considered for protection. These include:

- (a) from members of the public.
- (b) through evaluation of commercial project proposals - Vanimo, etc.
- (c) by departmental field officers.
- (d) from individual Scientists and other researchers.

CLASSIFICATIONS

The following are the principal classifications and general criteria for protected areas in Papua New Guinea:

National Parks

Criteria

Extensive areas of outstanding scenic and scientific interest which are of national significance. Minimum area desirable is 1,000 hectares but areas should exceed 2,000 hectares. Ideally, the whole range of land-forms and environments found in Papua New Guinea should be represented. They should be of such quality to attract tourists and other visitors.

Functions

National Parks have two main functions, firstly for public use and understanding of the outstanding natural, scenic and scientific values of the area and secondly, the conservation of nature through protection of undisturbed habitat.

Provincial Parks

Criteria

Natural Areas of less extent than national parks; frequently less than 2,000 hectares and very often less than 1,000 hectares. Not necessarily of national significance but an area of scenic and recreational importance at provincial level.

Function

Provides areas for outdoor recreation in a natural setting close to major town centres of population. They will largely be concerned with the provision of day-use recreation facilities for village and town dwellers.

Historical SitesCriteria

Areas of historic significance, covering prehistory and history and including recent history. Areas may be of any size. In many cases adjacent areas will be developed for recreational purposes.

Function

Preservation of areas of historic and prehistoric significance and their interpretation to the public.

Nature ReservesCriteria

Areas representative of various ecosystems or smaller areas necessarily of scenic or tourist attraction and designed for minimum access and use by the public. Areas may be of any size depending on their purposes.

Functions

Preservation of samples of ecosystems and habitats either for their intrinsic value or for the protection of wildlife generally or specifically. Scientific observation and research is permitted, but there is only very limited approval of public access.

National Walking TrackCriteria

A physically challenging and scenic primitive route through natural landscape. Wherever possible a minimum easement of 10 metres of natural vegetation on each side of the track. Advantage may be taken of existing national parks or other large areas of reserved natural landscape.

Functions

Provides for hiking or walking in natural surroundings over long distances.

SanctuariesCriteria

Area must be suitable for breeding specific species of indigenous wildlife and the display of indigenous wildlife to the public. It should contain some natural habitat in addition to the display area. No limit is imposed on the size of the area at either the top or bottom of the scale. Access and visitation to these areas will be available by the public for education and recreation purposes.

Functions

To provide areas where people can view species of indigenous wildlife and for natural history education. An area where research can be carried out into various species of Papua New Guinea wildlife and for use of captive breeding programmes. In some cases adjacent recreational areas will be developed to foster interest in and concern for Papua New Guinea's wildlife.

It would be presumptuous to give details of traditional customs and practices which facilitate protected area and conservation objectives. Papua New Guinea has 700 different languages and therefore customs related to resource conservation vary considerably. However, there are some traditional practices that have a bearing on conservation. These are:

a) Land Tenure Systems

Most land is owned by the people. 97% of the total area is still under customary land tenure. Land ownership is invested in the group and handed down in either the female or the male line. Land tenure systems incorporate many resource management and conservation practices. No comprehensive research has been made of traditional conservation methods. This is one area where funding and manpower for research result in information valuable for conservation.

b) Customary Rules

Rules which may prevent felling of trees and the harvesting of plants and certain animal species are common throughout Papua New Guinea. Although these are breaking down with the present transition to the modern way of life, there is fortunately a law which assists their retention and the protection of these species.

c) Traditional Beliefs

Sacred sites where people are not allowed to go are spread through the country. It is intended to safeguard as many of these as possible.

Wildlife Management Areas (WMA)

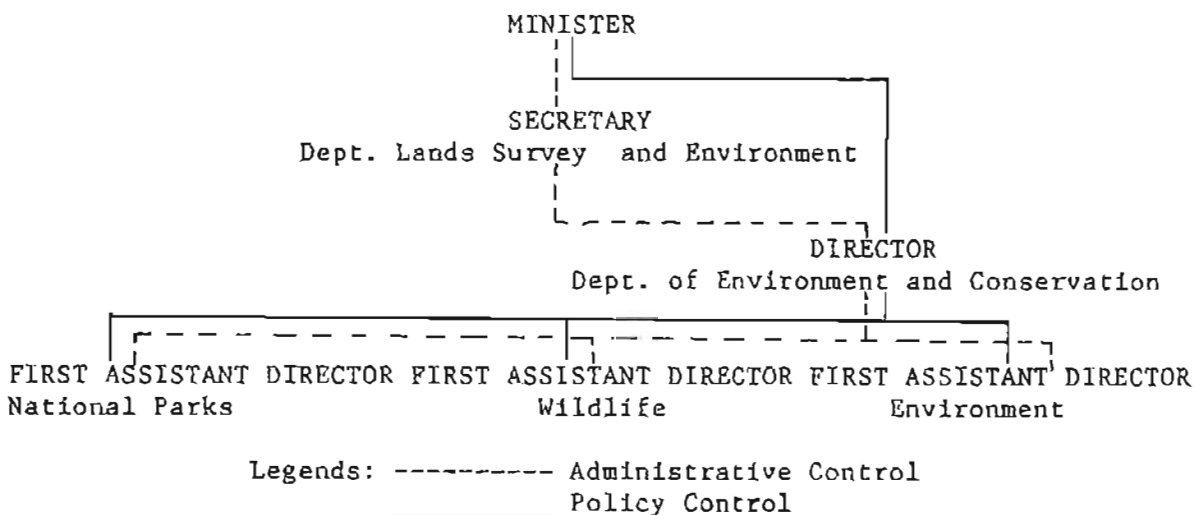
These are most practical and can be used to help people to conserve or look after the wildlife on their land or in the sea under their control or ownership. Wildlife Management Areas can be declared only at the request of the landowners, but the declaration does not in anyway affect the ownership of the land or sea and their resources. It only affects the way the resources are used.

There is no limit to the size or area of WMA. It can be established on the land, in the sea or both together. It is much easier to establish a WMA if the landowner(s) agree(s) to the boundary and rules.

A WMA is an area reserved or protected at the request of the landowners for conservation and controlled utilisation of the wildlife and its habitat.

The Fauna Protection and Control Act of 1966, and amendments thereof, is one example of legislation which reinforces the traditional rules for controlling and conserving wildlife and its habitat. Under this Act, the Minister for Environment and Conservation can declare a WMA to protect certain wildlife species from over exploitation.

PARKS AND RESERVES ADMINISTRATION

Organisation Chart

ADDRESSES

1. The Director
Department of Environment and Conservation
P.O. Box 6601
Boroko,
Papua New Guinea
2. Assistant Secretary
National Parks Service
Dept. of Environment & Conservation
P.O. Box 6601
Boroko
Papua New Guinea
3. Assistant Secretary
Wildlife Division
Dept. of Environment & Conservation
P.O. Box 6601
Boroko
Papua New Guinea

LIST OF PROTECTED AREAS (See attached maps)

LIST OF PROPOSED AREAS (See attached maps)

CONSTRAINTS TO THE EFFECTIVE OPERATION OF THE DEC

1. Manpower
The Department of Environment and Conservation is under-staffed. It is operating at a maintenance level and consequently does not consider it is living up to the responsibilities placed upon it by the government and the Constitution.
2. Skills
The shortage of Papua New Guineans with adequate training and experience in resource management is seriously affecting the performance of the department, and the environment of PNG.
3. Bureaucratic Change
The successive changes in budget techniques (Zero-based Budget, NPEP etc) do little to provide stability and harmony in planning and establishment of development goals.
4. Bureaucratic Ineptness
The department includes perhaps the most experienced and skilled body of people in environment and conservation in PNG. Alteration and rejection of their decisions by less qualified personnel higher in the bureaucratic structure leads to lowering of morale.
5. Ineffective Planning Mechanisms
The lack of a multi-disciplinary approach to planning and decision-making frequently leads to the DEC being totally overlooked in areas which fall within its responsibility.

MAPS: (See Maps 1 & 2)

PART II: INFORMATION SHEETS ON PROTECTED AREAS

NAME OF THE PROTECTED AREA Namanatabu

MANAGEMENT CATEGORY Historic Reserve

LEGAL PROTECTION
Protection of War relic as well as flora and fauna within the Reserve.

DATE ESTABLISHED 15th May 1979

GEOGRAPHIC LOCATION
Central Province about 15 km from Port Moresby City. 140° 49' E 9° to S.

ALTITUDE 160 - 1,000m

AREA 27.44 ha.

LAND TENURE Government Land.

VEGETATION
Savanah grassland with some sago trees around the lake.

FURTHER INFORMATION Central Provincial Ranger
National Parks Service
Department of Environment & Conservation
P.O. Box 5749,
BOROKO, PNG.

NAME OF THE PROTECTED AREA Mt. Wilhelm

MANAGEMENT CATEGORY National Parks

LEGAL PROTECTION Complete protection of flora and fauna

DATE ESTABLISHED Gazette still being drawn up.

GEOGRAPHIC LOCATION Simbu Province 145° 1'E 5° 47'S

ALTITUDE 4,706m

AREA 4,856 ha

LAND TENURE Government Land

PHYSICAL FEATURES
Highest mountain in the country. The summit does have some snow most of the year.

NOTEWORTHY FAUNA
Some Birds of Paradise can be seen at the foot of the mountain.

SPECIAL SCIENTIFIC FACILITIES
A research hut half-way to the summit and a guest house.

STAFF: 1 caretaker

FURTHER INFORMATION Provincial Ranger
P.O. Box 657,
Goroka, EHP.

NAME OF THE PROTECTED AREA: Mt. Gahavisuka

MANAGEMENT CATEGORY Provincial Park

LEGAL PROTECTION Complete protection.

DATE ESTABLISHED Gazettal is being prepared.

GEOGRAPHIC LOCATION
Eastern Highlands Province 6 miles north of Goroka Town the HQ of the Province.

ALTITUDE 2,200 - 2,290m.

AREA 77.4 ha.

LAND TENURE
Government land. Land has been purchased by the Government.

VEGETATION
Mountain forest including various species of Orchids.

ZONING

1. At the Centre is an Orchid farm.
2. Outside is a natural environment.

DISTURBANCES AND DEFICIENCIES
Pigs from local village digging up the facilities being constructed as well as vegetation or soil.

STAFF

- 1 Ranger in Charge
- 1 Curator
- 1 Assistant Curator

FURTHER INFORMATION

Ranger-in-Charge
Mt Gahavisuka Provincial Park
P.O. Box 657
Goroka, E.H.P. PNG

NAME OF THE PROTECTED AREA Talele Island

MANAGEMENT CATEGORY Nature Reserve

LEGAL PROTECTION
Complete protection of flora and fauna including surrounding marine life.

DATE ESTABLISHED 1st October, 1973.

GEOGRAPHIC LOCATION
East New Britain Province 151°35' E 4°10' S.

ALTITUDE Sea level.

AREA: 1.4 ha.

LAND TENURE Government land

PHYSICAL FEATURES Island with nice beaches and corals.

VEGETATION Herbaceous beach vegetation
Shrubs and woodlands

FURTHER INFORMATION Assistant Secretary
National Parks Service
Department of Environment & Conservation
P.O. Box 5749
Boroko.

NAME OF THE PROTECTED AREA Varirata

MANAGEMENT CATEGORY National Parks

LEGAL PROTECTION
Complete protection for vegetation with limited hunting permitted under strict control.

DATE ESTABLISHED 18 December 1969

GEOGRAPHIC LOCATION Central Province 147° 20-23' E 9° 26-30' S

ALTITUDE 120 - 1,067m

AREA 1,062 ha

LAND TENURE Government land

PHYSICAL FEATURES Has scenic areas

VEGETATION
Topical Rainforest with patches of grassland.

NORTHEWORTHY FAUNA Bird of Paradise.

CULTURAL HERITAGE Has Koari tree house

CONSERVATION MANAGEMENT Controlled hunting

ZONING
3 zones: 1) Recreational
2) Area with minimum excess
3) Totally restricted area

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

STAFF 1 Ranger-in-Charge
1 Assistant Ranger

FURTHER INFORMATION Assistant Secretary
National Parks Service
Department of Environment & Conservation
P.O. Box 5749,
Boroko, PNG

NAME OF THE PROTECTED AREA McAdam

MANAGEMENT CATEGORY National Parks

LEGAL PROTECTION
Complete protection of vegetation and hunting.

DATE ESTABLISHED 1st July 1970

GEOGRAPHIC LOCATION Morobe Province 146° 42' E 7° 15-19'S

ALTITUDE 670 - 1,980m.

AREA 2,080.1 ha.

LAND TENURE Government land

PHYSICAL FEATURES
Mountainous with steep slopes with narrow valleys and gorges but with some wide flat bottomed valleys.

VEGETATION
Last stands of virgin forest of Hoop and Klinkii pine.

DISTURBANCES AND DEFICIENCIES
Mining and Gardening near the boundary by local villagers.

STAFF 1 Ranger-in-Charge

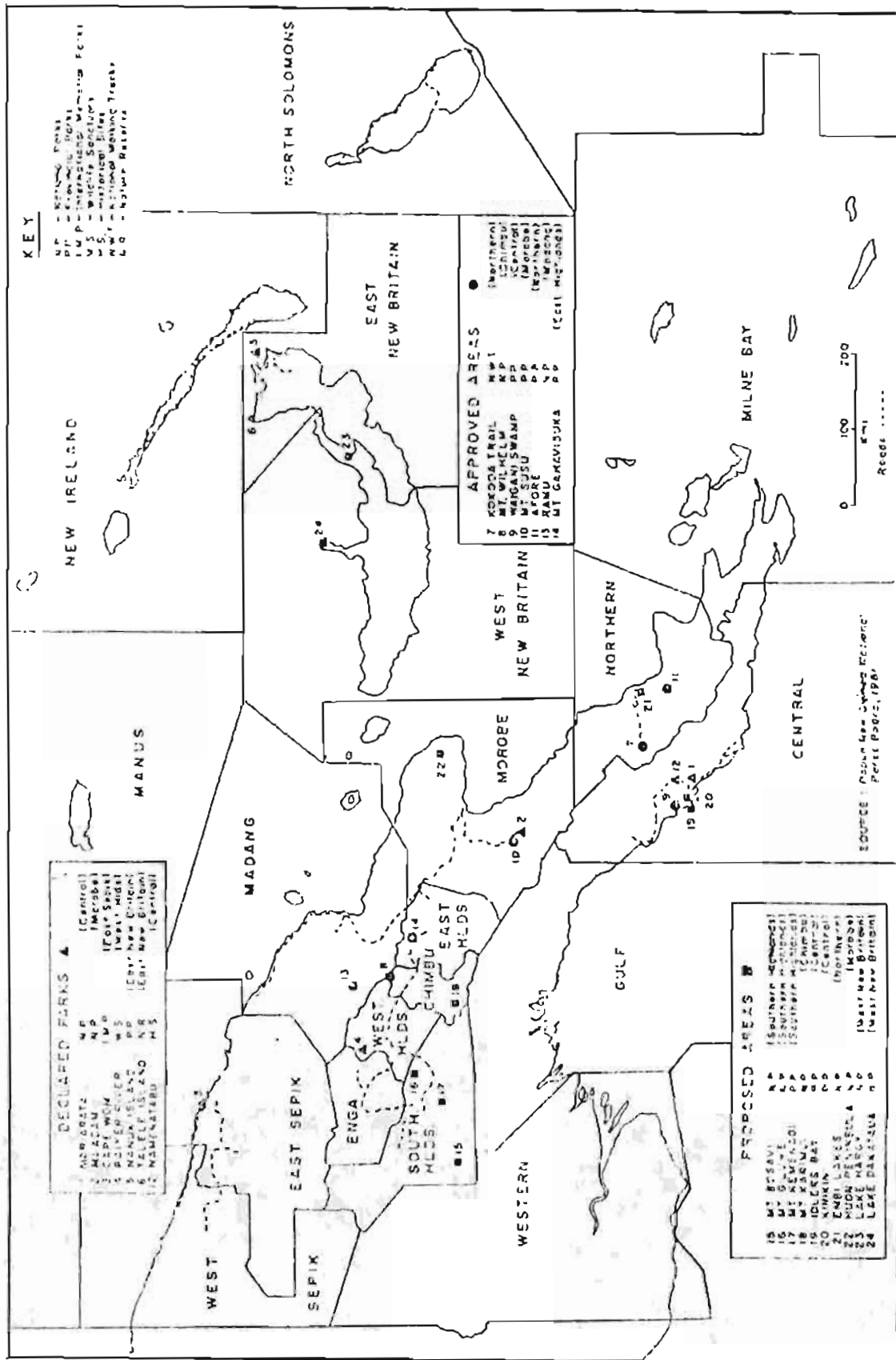
FURTHER INFORMATION
Ranger-in-Charge
McAdam National Park
P.O. Box 127
Bulolo
Morobe Province, PNG.

<u>NAME OF THE PROTECTED AREA</u>	Cape Wom
<u>MANAGEMENT CATEGORY</u>	Memorial Park
<u>LEGAL PROTECTION</u>	Protection of war relics
<u>DATE ESTABLISHED</u>	8th October, 1973
<u>GEOGRAPHIC LOCATION</u>	East Sepik Province 143° 40' E 3° 33-4'S
<u>ALTITUDE</u>	Sea level
<u>AREA</u>	105.42ha
<u>LAND TENURE</u>	Government land
<u>PHYSICAL FEATURES</u>	Has a war memorial
<u>VEGETATION</u>	General coastal vegetation community
<u>ZONING</u>	
	Two zones: 1. Memorial Park Area 2. Picnic Area.
<u>STAFF</u>	1 Ranger-in-Charge.
<u>FURTHER INFORMATION</u>	Ranger-in-Charge Cape Wom Memorial Park P.O. Box 516 Wewak, E.S.P. PNG
<u>NAME OF PROTECTED AREA</u>	Nanuk Island
<u>MANAGEMENT CATEGORY</u>	Provincial Park
<u>LEGAL PROTECTION</u>	Complete protection of flora and fauna
<u>DATE ESTABLISHED</u>	26th November, 1973
<u>GEOGRAPHIC LOCATION</u>	East New Britain Province 151°3' E 4°6'S
<u>ALTITUDE</u>	Sea level
<u>AREA</u>	4.0 ha.
<u>LAND TENURE</u>	Government land.
<u>PHYSICAL FEATURES</u>	An Island surrounded by beaches and coral reefs.
<u>VEGETATION</u>	
	Coconut trees and other coastal plants, Mangroves, trees and creeping plants.
<u>STAFF</u>	1 caretaker.
<u>FURTHER INFORMATION</u>	Assistant Secretary National Parks Service Department of Environment & Conservation P.O. Box 5749, Boroko, PNG.

<u>NAME OF THE PROTECTED AREA</u>	Baiyer River
<u>MANAGEMENT CATEGORY</u>	Sanctuary
<u>LEGAL PROTECTION</u>	Complete protection of fauna and flora.
<u>DATE ESTABLISHED</u>	13th January, 1968
<u>ALTITUDE</u>	800 - 1,200
<u>AREA</u>	120 ha.
<u>LAND TENURE</u>	Government Land
<u>PHYSICAL FEATURES</u>	Stream and Creeks.
<u>VEGETATION</u>	Lowland hill forest, grasslands.
<u>NOTEWORTHY FAUNA</u>	A variety of Papua New Guinea Wildlife being bred.
<u>ZONING</u>	3 Zones: 1) Recreational Area 2) Zoo areas 3) Natural Environment
<u>DISTURBANCES AND DEFICIENCIES</u>	Hunting by local villages
<u>SPECIAL SCIENTIFIC FACILITIES</u>	Lodges and laboratory
<u>STAFF</u>	1 Superintendent 1 Ranger 1 Business Manager
<u>FURTHER INFORMATION</u>	Superintendent Baiyer River Sanctuary P.O. Box 490 Mt. Hagen, PNG.

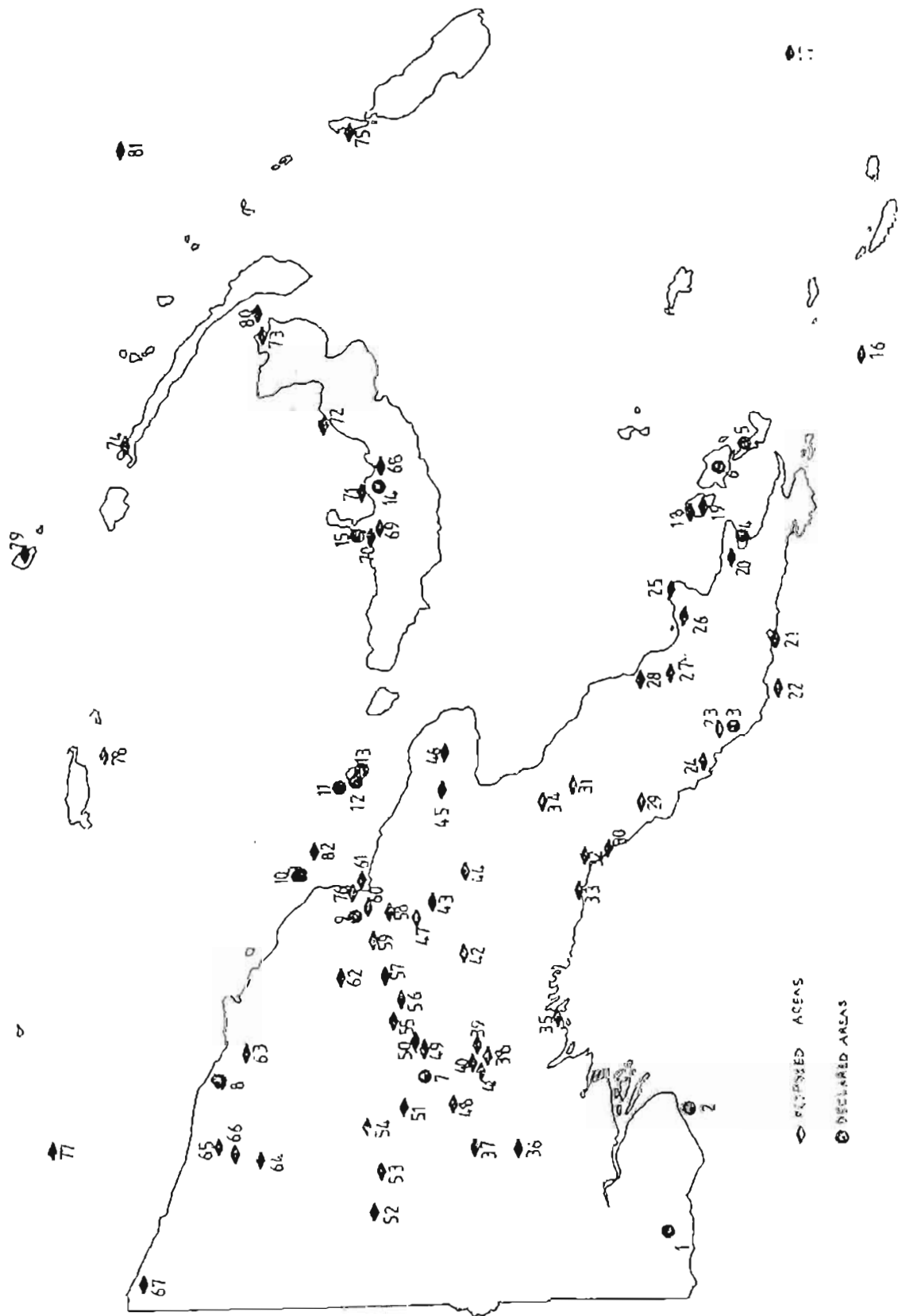
NATIONAL PARKS CONSERVATION AREAS
IN PAPIA NEW GUINEA

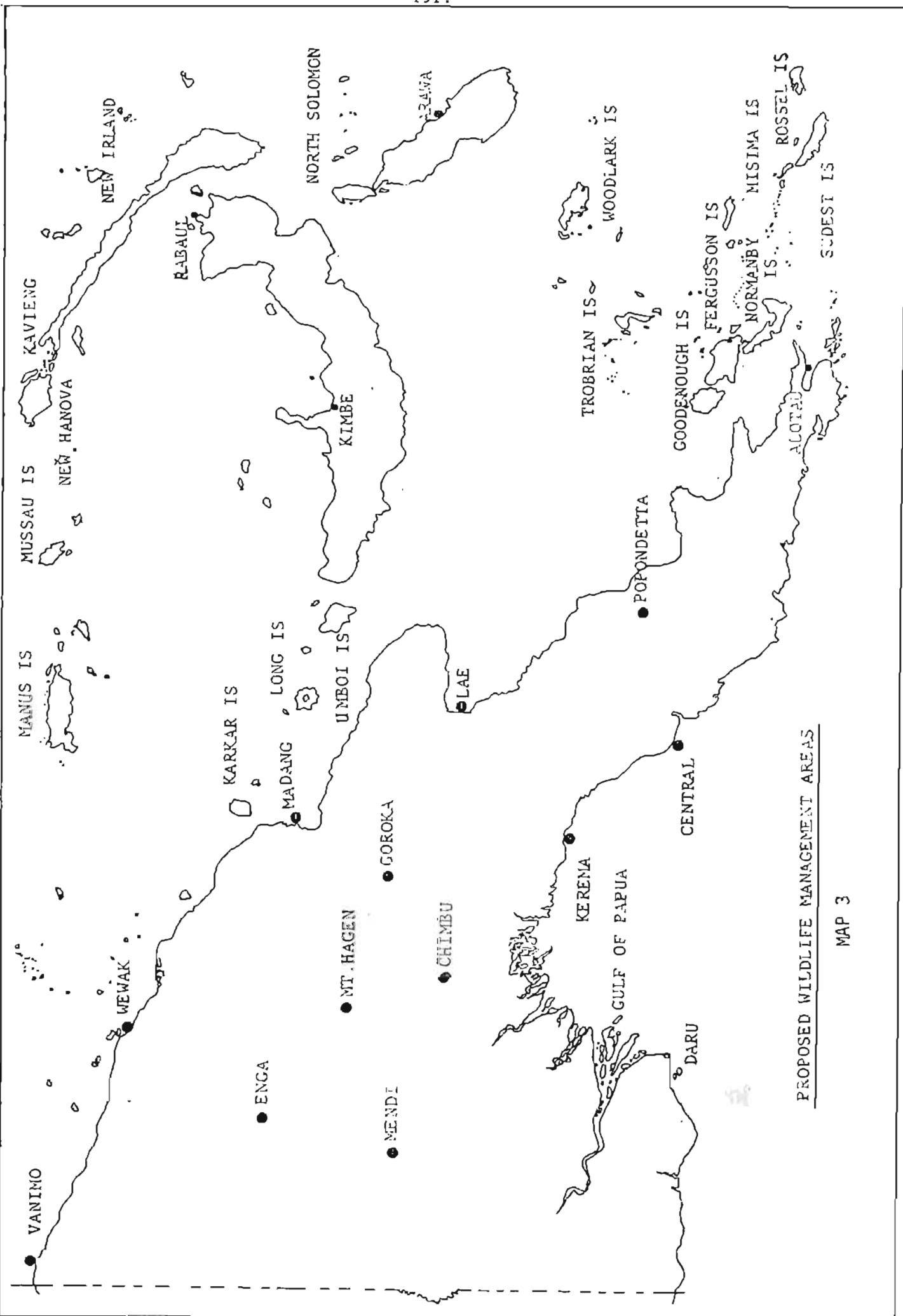
MAP 1



MAP 2

PAPUA NEW GUINEA
CONSERVATION AREAS





PROPOSED WILDLIFE MANAGEMENT AREAS

MAP 3

APPENDIX 1ACTS INCLUDED IN
"REVISED LAWS OF PAPUA NEW GUINEA 1975"

<u>TITLE</u>	<u>CHAPTER</u>
Customs	101
Exports (Control & Valuation)	108
Cultural Development	153
*Fauna (Protection and Control)	154
National Cultural Property (Preservation)	156
National Parks	157
Public Museums & Art Gallery	158
Land	185
Lands Acquisition (Development purposes)	192
Mining Development	197
Petroleum (Prospecting & Mining)	198
Petroleum (Submerged lands)	199
Water Resources	205
Animal Disease and Control	206
Continental Shelf (Living Natural Resources)	210
Fisheries	214
Forestry	216
Forestry (Private dealings)	217
Plant Disease and Control	220
Whaling	225
Quarantine	234
Land Trespass	271
Water Supply (Papua)	328

*Department of Environment and Conservation responsibility

ACTS PASSED SINCE THE
"REVISED LAWS 1975"

*	Environmental Planning Act	1978
*	Environmental Contaminants Act	1978
	Public Health Act (various amendments)	
	Mining Act (various amendments)	
	Bougainville Copper Agreement	
*	Dumping of Wastes at Sea Act	
*	Water Resources Act	
	Mining (OK Tedi Supplemental Agreement) Act	
*	Crocodile Trade (Protection) Act	1974-82
	Customs (Prohibited Exports) Regulations	1979
	Customs (Prohibited Imports) Regulations	1973-75
*	International Trade (Flora and Fauna) Act	1979
*	National Parks Act (supercedes Chapter 157)	1983
*	Conservation Areas Act	1978
	Preservation of Pollution of the Sea Act	1979
	Industrial Safety, Health and Welfare Act	
	National Standards Act	
	National Technical Standards Act	

*Department of Environment and Conservation has the responsibility for the administration of these Acts.

INTERNATIONAL AGREEMENTS

PNG is party to 14 conventions. Those with some environmental/conservation implications are:-

- | | | | |
|----|--|----------------------------------|------|
| 1. | International Plant Protection Convention, | Rome | 1951 |
| 2. | International Convention for the Prevention of Pollution of the Sea by Oil,
(as amended 11 April 1962 & 21 October 1969). | London | 1954 |
| 3. | Plant Protection Agreement for the South-East Asia and Pacific Region (as amended), | Rome | 1956 |
| 4. | International Convention on Civil Liability for Oil Pollution Damage, | Brussels | 1969 |
| 5. | Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter. | London
Mexico City
Moscow, | 1972 |
| 6. | Convention on International Trade in Endangered Species of Wild Fauna & Flora, | Washington | 1973 |
| 7. | Convention on Conservation of Nature in the South Pacific, | Apia | 1976 |
| 8. | Convention on the Prohibition of Military or any other hostile use of environmental modification techniques, | New York | 1976 |
| 9. | United Nations Convention on the Law of the Sea, | Montago Bay | 1982 |

SOLOMON ISLANDS

PART 1 - GENERAL REPORT

INTRODUCTION

The Solomon Islands consists of a double chain of six large islands and numerous smaller ones, dispersed over 1,400 kilometres. The larger islands are alike in that they have a central mountain spine, falling away through a series of foothills to the coast. These larger islands are rugged and mountainous having peaks rising to an average height of 1,000 metres with the highest being 2,450 metres.

Rivers and creeks are numerous on all of the larger islands as well as many of the smaller ones. The land is dominated by the presence of extensive stands of virgin tropical rainforest. Almost 88% of the 28 million hectares is tree covered. Vegetation on the smaller islands usually consists of thick scrub with the inevitable scattering of coastal coconut palm groves. Both large and small islands are fringed with extensive mangrove growth in many areas.

There are at least six major lagoons within the island groups which contain very rich and diverse marine life and are dotted with hundreds of tiny islands.

The estimated population in June 1980 was 228,000 which compares with the 1976 census total of 196,800. According to the government statistics office, the country's current annual growth rate is 3.4% and by the end of 1985 a projected figure of 270,000 may well be reached. Nearly half of the population is under the age of fifteen years.

About 94% of the population is Melanesian, with the Polynesians and the recent influx of Micronesian settlers make up the rest. Well over three-quarters of the population are resident in the rural areas scattered in villages all over the country.

POLICY

Solomon Islanders have retained their traditional system of 'protected areas' and other associated practices for centuries. They value nature highly and respect the resources it provides, recognising that these are essential for their livelihood.

However, due to the impact of the various development activities which have taken place in recent years, the situation is quickly changing. Economic pressures have led to greatly increased demands on the environment and its resources. In a small country like the Solomons where the land area is very limited, natural resources can be easily depleted if their exploitation is not controlled. Realisation that traditional methods of controlling resources and protecting areas have their limitations has led to the introduction of the concept of establishing parks, botanical gardens and bird sanctuaries in the Solomons.

The Solomon Islands protected area system began in the early 1950's when the legal basis for National Parks was established by the National Parks Act in 1954, one of the statutes of the British Solomon Islands Protectorate. This was followed by a Proclamation which established the Queen Elizabeth National Park which is the only formally established national park in the country. Its boundaries were amended by a legal notice in 1973. There are many proposed protected areas which have been identified

but their establishment has been prevented by numerous problems over the years.

A proposal to conserve a number of smaller distinctive areas of forest types has been advanced but no formal protection measures have yet been applied since much of the land is held in customary ownership. Several bird sanctuaries have been declared on some of the smaller islands. However, these have suffered from habitat destruction and poaching, since there is no one to police them.

There is now a growing interest from the Provinces and some individual landowners to have portions of their land set aside for parks or reserves. This need has probably been highlighted by the massive forest destruction that is taking place throughout the country due to logging and the Government has, for the first time, established the Environment and Conservation Division in the Ministry of Natural Resources which will be responsible for the setting up of parks, wildlife sanctuaries, botanical gardens and reserves. The priority now is to review the whole situation regarding much of the basic issues related to the establishment of parks, and to carry out a nationwide campaign to educate the people on the concept of parks in general. This would clear up some of the present misunderstandings and should lead to greater acceptability of the need for protected areas.

CONSERVATION POLICY

There is no national conservation policy as such and the implementation of conservation principles and practices has been left to those ministries which have direct responsibilities in relation to resource development, such as forestry, agriculture, fisheries and mining. However since the beginning of this year efforts have been made to compile the necessary information for a national environment conservation policy which will be presented to the Government before the end of the year.

LAWS

There are no specific laws regarding Parks, Wildlife, Reserves etc, except for the National Parks Act of 1954 and perhaps the Wild Bird Protection Act 1914/30.

Under the National Parks Act the Queen Elizabeth Park was declared by the Proclamation No. 5 of 1954.

Under the Wild Bird Protection Act, five bird sanctuaries were declared by proclamation over a number of years as follows:-

Tulagi Island	10 November, 1930
Oema Island & Oema Atoll	17 October, 1931
Island of Mandoleana	1 October, 1937
Island of Dalakalau	5 June, 1954
Island of Dalakalonga	5 June, 1954

A recently published report contained the following comments regarding the various laws concerned with environment and conservation.

a. Forestry and Timber Act 1969/77

An archaic Act of narrow perspective providing for timber use and for the protection of forests for timber use but making no provision for other uses and values of the forest, the sole exception being S.5(3) which gives some scope for forest water catchment protection (the only provision in Solomon Islands legislation for control of disturbance in water catchments). No provision exists for control of avoidable environmental damage and powers to control timber wastage are inadequate.

- b. Rivers, Waters Act 1964/68
Designed to protect uses of river wasters, this Act provides for penalties for damage, pollution to watercourses and their waters, but is applied only to declared areas, of which there are very few.
- c. Penal Code 1963/70
Penal Code, in S.172, provides for penalties for polluting or obstructing watercourses.
- d. Environmental Health Act 1980
For the control of waste management and environment contamination there is a fairly comprehensive coverage through regulations adapted from the repealed Public Health Act 1970. It covers protection of water supplies and provides some capacity for dealing with air pollution.
- e. Town and Country Planning Act 1979
This Act provides for tree preservation orders for "any tree, groups of trees or woodlands in the interests of amenity".
- f. Wild Birds Protection Act 1914/30
The legislation makes some provision for controls on the killing or wounding of scheduled birds, for damage to their eggs, nests or for sale of birds or parts of birds. Sanctuaries for bird protection can be declared but "protection" covers only the birds, their nests and eggs. There is no provision for protective management of bird habitats. The schedule of protected birds should be based upon ecological indicators of their population status and need for this sort of protection. Some of the listed bird names are erroneous; some of the birds listed may not need all of the protection afforded by the legislation; and many birds which are not listed are in need of protection. The ten dollar penalty level is inadequate.
- g. Mining Act 1968/69
The Mining Act is lacking in that it includes virtually no reference to environmental considerations. The one exception is a watercourse protection requirement which could be used to improve restrictions on prospectors and miners in the use and disposal of water and in the removal of vegetation when this might cause streambank erosion. Fortunately, however, the Act does give the minister power to make regulations. With new Regulations formulated under the existing Act a good degree of environmental management might be achieved.
- h. Fisheries Act 1972/77
The Fisheries Act gives power to the minister to provide for the conservation and protection of fish or any particular species of fish. An amendment to the Act to recognise the fact that many endemic fish and crustaceans are present in forest streams and rivers would be appropriate.
- i. National Parks Act 1954
This Act provides for a type of strictly protected natural area which is not consistent with current concepts of resource use, makes inadequate allowance for genuine customary needs, and places no obligation upon the administering agency to manage a national park in accordance with objectives for the park. It is not a practical piece of legislation.

j. Lands and Titles Act 1968/70

Section 227 of this Act provides for a Preservation Order which can be applied to "land ... a matter of public interest, by reasons of the historic, architectural, traditional, artistic, archeological, botanical or religious interest attached thereto...".

The Act applies only to government land (a mere 8% of the land area) where, under a declared local planning scheme it can be used to: "... protect features or areas of social, historical scene or architectural importance",

"... allocate or define the sites of ... nature reserves .."

Regulation making powers under the Act give considerable scope for establishing protected areas on government land.

The Act has been used as a basis for establishing protected areas by laws, e.g. Santa Isabel Province (wildlife sanctuary) by-law 1981.

The government is investigating the possibility of a review of existing protective legislation and secondly, the development of new legislation to meet the current protected area needs of the Solomon Islands.

TRADITIONAL USE AND KNOWLEDGE OF MARINE SPECIES IN THE SOLOMON ISLANDS

Marine species which include fish, sea turtles, sea grasses, sea algae and sea-shells are mainly used by the Solomon Islanders as a source of food (protein). Additional uses are also found with dolphins, sea turtles and the seashells. These will be stated in detail in the following sections.

- (1) Marine Fish Species are mainly used as a source of food.
- (2) Dolphin - In addition to the use of the fish (i.e. its flesh) as a source of food (protein), the teeth of the fish are used quite extensively;
 - i) in making necklaces
 - ii) as a form of custom money for bride prices and for trading.
 - iii) in decoration such as headbands for custom dancers and brides.
- (3) Sea grasses and sea algae, though not used so extensively are also used as a source of food. The inflated sac-like appendages on sea algae are edible and are eaten mostly by the younger kids. The fruit of a sea grass which is commonly found in sandy areas of a reef are also edible and these are either eaten raw or cooked in bamboo containers. This is used as a substitute for betel-nuts as well and is chewed with leaves and lime (calcium oxide-Cao or powder from burnt coral polyps).
- (4) Molluscs (Bivalves - i.e. those with two shells)
 - (1) Oysters: Clean oyster shells (i.e. shells which have been previously cleaned with grinding or volcanic stone are used:
 - i) for eating (i.e. as a spoon).
 - ii) scraping coconut (i.e. meat from the kernel)
 - iii) in harvesting of taro (i.e. in cleaning the small roots, stem and leaves from the main root which will finally be used as the root crop).
 - iv) During the post-harvesting season for yams, cleaned oyster shells are used in the cutting of yams into small pieces which are usually left to dry for some time before the planting season.

v) by custom dancers as a half moon pendant which is hung around the neck by means of a string and is left to suspend somewhere around the chest of the dancer.

(2) Clams (or clam shells) - large shells which are probably from the giant clam are used:

- i) a water trough in pigstys.
- ii) in the manufacture of bracelets for the wrist, arm and legs of men (warriors) during the olden days.
- iii) as custom shell money by the Choiseul people for bride prices and trading.

(3) Cockles (cockle shells) - These resemble the carditas, a kind of hard shell with ridges on the outer surface of the shell which are used for scraping coconut and eating (i.e. as a spoon).

(4) Heart Cockles (known as "Kea" in the Lau dialect) - shells are used for scraping coconut and the fruit of a certain mangrove tree which the local people use as food.

(5) The shells of a small bivalve which is commonly found on sand beaches and is locally known as "Sisile" (in Lau dialect) is used in the decoration of war canoes.

(6) Pen shells - Very large shells which resemble oysters are widely used for the making of custom shell money on Malaita Province. The black parts (or beads) on the shell money came from this shell.

(7) Lucinas (Lucinacea) - a large thick shell and some are colourful (i.e. red markings around the inside edge of the valves) are used widely by the Malaita people for making custom money. The red parts (beads) of the shell money come from this particular shell.

(5) Molluscs (univalves, i.e. one shell)

(1) Poached egg cowry (Ovula ovum) - is used by custom dancers during a custom feast as a ceremonial regalia. This is usually worn around the head of the dancer. The shell is also used in the decoration of war canoes and custom houses as well.

(2) Small Cowries - are used in the decoration of war canoes and baskets as well.

(3) Large humpback cowry - are used as sinkers on turtle nets and other forms of fishing nets.

(4) Trumpet Shells - are used in sending messages (e.g. calling of a meeting and during tribal wars etc) and is also used during joyous occasions such as Christmas and New Year.

(5) Cone Shells - are used in the making of necklaces. The colourful round bottom parts of the shell are usually used in this case while the other parts are chipped off and thrown away.

(6) Auger shells (Conacea) - long shell with many whorled parts which looks more like a boring tool are used in the decoration of arm bands that are used by custom dancers. The bottom parts of the shell are usually used in this way after being ground down into smaller pieces.

- (7) Trochus shell (Trochacca) - are used for making wrist bands.
- (8) Turban shells - the heavy operculum is used in games played by small children (i.e. use similarly as coin money).

(6) Molluscs (cephalopods)

- (1) Octopus and squid - are used by the local people as a source of food and is used as a bait for fishing.
- (2) Nautilus - shells of this animal are used widely in the decoration of carvings and canoes and are used by the local people as a drinking cup as well.

Corals:

Branching coral polyps are taken by the local people and are used for the production of lime (calcium oxide (CaO) which is used with betel-nuts. Small coral stones are used on roads or pathways and the larger ones are used for the construction of artificial islands.

Turtles (chelonia):

- (1) Hawksbill Turtle - The hardshell of the carapace is used for making ear-rings and combs and is also used on shell money (i.e. the division on large shell monies.

Crown Starfish:

When someone accidentally steps on its spines, the whole animal is turned upside down so that its mouth faces upwards. The person's foot is then placed on the mouth of the starfish so that it will suck the broken spines out from the foot.

PROTECTED AREAS

The only listed protected area is Queen Elizabeth Park established under the National Parks Act No. 5 of 1954.

PROPOSED PROTECTED AREAS (Map 1)

KEY: To proposed protected areas (Map 1):

1. Mt. Galego - Guadalcanal
2. Mataniko Falls "
3. Mt. Austin "
4. Tenaru Falls "
5. Lee's Lake "
6. Lauvi Lagoon "
7. Mt. Kaichui "
8. Mt. Tatuve "
9. Mt. Popomanasiu "
10. Mt. Makaraburu "
11. Lake Te Nggono - Rennell Island
12. Fauna and Flora Reserves - Rennell Island
13. Vatuluma Posovi Cave - Guadalcanal
14. Lowland and upland forest - Kolombangara
15. Forest and bird reserves - Rendova
16. Forest and bird reserves - Tetepari
17. Forest and bird reserves - Ranongga
18. Forest and bird reserves - Gizo

19. Forest and bird reserves - Uki Ni Masi
20. Forest and bird reserves - New Georgia
21. Forest Reserves - San Cristobal (Makira)
22. Forest Reserves - Choiseul
23. Forest Reserves - Isabel
24. Mountain forest Reserves (with some lowland forest) - Malaita
25. Bird Reserves for breeding pigeons - Oema Island
26. Forest Reserves - Vanikolo
27. Forest Reserves - Santa Cruz
28. Forest Reserves - Santa Cruz
29. Sago Swamp Forest - Guadalcanal
30. Cauarina Woodland - San Jorge
31. Low woody regrowth - Nggatokae
32. Grassland terraces incised by wooded valleys - Guadalcanal
33. Megapod breeding and habitat areas - Savo Island

NOTE: All mangrove areas should be included as Protected Forest.

PROBLEMS NEEDS AND PROSPECTS

Many Solomon Islanders are not aware how important conservation is for the future prosperity and standard of living of the nation. There is a clear need to manage and provide natural resources for future generations in such a manner that an increased standard of living is obtained without undue destruction or degradation of the environment. Many developing nations have exploited their resources too quickly and are now facing problems of starvation, pollution, over-population, urban migration, soil erosion, drought, flood and coral reef destruction.

Dr Arthur Dahl in his report on conservation to the Solomon Islands Government in 1975 wrote: "The distinctive natural environment and traditional culture of the Solomon Islands are presently being altered and lost as a secondary result of development activities. With appropriate government leadership and planning, these side effects can be minimised and avoided without significantly affecting economic development.

A more rational, environmental approach to development in the past could have produced better returns from development".

The main obstacles to conservation based development in the Solomons are:

- a. absence of conservation awareness at the policy-making level.
- b. lack of environmental planning and rational use allocation.
- c. poor legislation and organisation.
- d. lack of training and basic information.
- e. lack of support for conservation.
- f. lack of conservation - based rural development.
- g. a misunderstanding that conservation will stop or hinder development. Really conservation is the wise use of natural resources for sustained utilisation with many rational and varying uses being made of that resource.
- h. 88% of land is customary owned and outside the sphere of present government influence and law.
- i. landowners have little cash income other than sale of logs to timber companies. Consequently, the land owner knows little about the destructive effects of logging, mining or agriculture. (93% of Solomon Islanders are subsistence farmers and one family in seven has no cash income whatsoever).
- j. lack of funding for conservation efforts.

- k. customary land owners may view the purchase of their land for conservation purposes as infringement of their right to use the land according to their customary ways (land alienation is a problem and contrary to government policy).

Listed below is a possible conservation strategy to help overcome some of these problems:

Environmental Education in primary and secondary schools, teacher Training Colleges and Technical Institutions. Emphasis should be placed on the unique Solomon Island plants and animals, why they should be conserved, traditional and commercial uses of the forest, the exploitive effects on the natural environment and the influence of forest on climate, soil and marine environments. This type of education would only be useful in the long term as school children have very little say in the community until adulthood. More immediate education needs are apparent in the villages where companies are negotiating with land owners for cutting rights. A recent report has stated that all accessible forest in Guadalcanal will be felled within 6 years and in the Solomons as a whole within 14 years. In most cases the land owner is at a very great disadvantage when dealing with the professional timber man. They know very little of the consequences of bad logging techniques and as a result the land becomes a scarred, eroded or weed choked landscape of little use in the future development of the nation.

The media is an effective method of introducing new or different methods of conservation concepts and should be used extensively to aid any education effort. Environmental programmes in pidgin should be pursued energetically by Solomon Islands Broadcasting Corporation (SIBC) and short simple articles by the press. Slide programmes are very effective when used in a village situation.

It is most important to include the local land owners in any conservation effort. Education is the key to this problem.

An Environmental Survey for the Solomon Islands: The flora and fauna of the Solomons is little known and detailed information on specie occurrence, distribution and ecology is required for the establishment of sustainable forest management practices. The South Pacific Regional Environmental Programme (SPREP) could be of assistance with this survey. So could the Worldlife Fund (WWF) and the International Union for Conservation of Nature and Natural Resources (IUCN). It is recommended that a general conservation survey proceed as follows:

- a. Review development objectives in relation to each of the conservation objectives and describe the extent to which each of the conservation objectives is or is not being achieved - with particular emphasis on the priority requirements - and the status of and threats to the living resources concerned;
- b. Identify the main obstacles to achieving the objectives and to removing or reducing the threats; and identify any special opportunities there may be overcoming such obstacles;
- c. Identify the measures required to achieve the objectives and to remove or reduce the threats to the living resources concerned;
- d. Determine priority ecosystems and species; the requirements for their conservation; and how these requirements could be met - providing planning and management guidelines with respect to such ecosystems and species;

- e. Analyse present and planned activities; comparing them with c. and d., and identify gaps that need filling and activities that need strengthening and support.
- f. Estimate the financial and other resources and the legislative and administrative measures, required to carry out the actions identified and identify the organisations that should be implementing them;
- g. Propose ways of supplying the financial and other resources required and of authorising and equipping the appropriate government departments to implement the required actions, identifying the bodies that possess the necessary resources and power of decision;
- h. Set out a plan of action to bring about the required political decisions and allocations of financial and other resources;
- i. Set out a programme of required measures, including administrative and legislative measures, for the maintenance of essential ecological processes and life support systems, the preservation of genetic diversity and the sustainable utilisation of ecosystems and species, noting particularly those priority requirements not yet met.

Conservation based rural development: As the population increases more forest is cut down to provide gardens, firewood and village areas. A recent report stated that 30% of the forest on Malaita will be cut down for gardens before it can be logged. Various agricultural practices can be pursued to reduce this impact. Agro forestry is one of these techniques and should be a priority consideration for the agriculture and forestry divisions as an improvement on wasteful and destructive slash and burn farming techniques. Fuel-wood production is of utmost importance. There is urgent need for agro-forestry in the high density population areas of Malaita and the squatter settlements of Honiara.

Agro-forestry is any sustainable land - use system that maintains or increases total yields by combining food crops with tree crops and/or livestock on the same unit of land, either alternately or at the same time, using management practices that suit the social and cultural characteristics of the local people and the economic and ecological conditions of the area. Agro-forestry decreases surface water run-off, nutrient loss, soil erosion and recycles leached and percolated nutrients and "pumps" new nutrients to the soil surface where they can be used by food crops.

It is a multi-purpose agricultural system providing food for humans and livestock, firewood, soil erosion control, sanctuaries for birds and wildlife, mulching and green manure crops and many other products used at the subsistence and export level.

A Forest Reserve System: Any conservation effort should include the customary land owners of any given area. their local knowledge and opinion on how to manage an area should be taken into consideration. The problems and solutions should be explained to the satisfaction of both parties. Ideally a land zoning system based on the following characteristics should be used to effectively manage forest areas for sustainable utilisations:

1. Outside the conservation district
 - a. Urban/Industrial Development areas
 - b. Agriculture development areas - subsistence/plantation/other
 - c. Forestry areas
 - d. Forestry Plantation areas and fuel forests
 - e. Road/transport infrastructure.

2. Inside the Conservation Districts

- a. Low density settlements
 - small villages in forested areas
- b. Non-intensive agriculture
 - traditional gardening practices but in low population areas
 - fuel wood gathering
 - gathering customary materials and medicines
 - hunting
- c. Watershed protection
 - limit traditional gardening to less erodable areas
 - limit fuel wood gathering
 - hunting (some restriction on birds and possums)
- d. Coastline and fisheries protection forest (mangrove)
 - limited fuel wood gathering
 - hunting (limited)
- e. Recreational Parks and Forests
 - no gardening
 - no fuel wood gathering
 - custom materials and medicine gathering
 - no littering
 - no logging
- f. Ecological reserves (strict controls). These will be relatively small areas in comparison to the total area of each island and will contain important examples of Solomon Island plants and animals. They must be relatively untouched areas and should remain that way so as to preserve as far into the future as is possible the biological heritage of the nation. Possibly because of the strict control measures needed for the sustained management of these areas a system of compensation may need to be implemented.

This means that no conservation area should be purchased as government land but should remain the property of the customary land owner. Possibly the land owner will help in the management and preservation of these ecological reserves. This will mean that the land owners will take pride and care for their unique natural areas. They may even become a source of income as their tourism potential is realised. The following strict controls would need to be implemented in any ecological reserve:

- no gardening
- no fuel wood gathering
- no customary materials and medicine gathering
- no hunting
- no logging
- no littering
- no mining
- no construction of houses, dams etc.
- no removal of any materials, animals, plants, wood/stone or otherwise.

Effective Environmental Law and Policing System: Effective and actively policed Environmental Laws are essential in controlling the extent and type of environmental impact created by natural resource exploitation. The importance of policing environmental laws cannot be over-emphasised.

Inspection should be a regular function of every government department involved in natural resources exploitation with an environmental quality committee or statutory body monitoring the overall programme. Inspection and policing of forestry roads, timber camps, log ponds, timber extraction methods; type, size and volume of logs, export quotes and erosion problems need urgent priority.

Overall the environmental laws and policing systems are archaic, non-functional and completely inadequate for the present situation and need priority consideration.

Dr. J. S.

PART II: LISTED PROTECTED AREAS

NAME: QUEEN ELIZABETH NATIONAL PARK

GENERAL:

The legal basis for National Parks in the Solomons is provided by the National Parks Act No. 5 of 1954 (CAP 34) of the laws of the Solomon Islands and the Queen Elizabeth National Park was declared under Proclamation No. 5 of 1954, but amended by Legal Notice No. 29 of 1973. Queen Elizabeth National Park is the only listed protected area in the Solomon Islands.

Proposals have been made to conserve a number of smaller areas of distinctive forest types, but since many are on land held in native Customary ownership, no formal protection measures have yet been applied. An arrangement was made to conserve most of a narrow radial strip of forest on Kolombangara Island which would otherwise have been logged.

STATUS AND LEGAL PROTECTION

Nominally total protection, but squatters within Honiara town boundary have cultivated substantial areas of the remaining woodland. Full protection would now be politically and physically impossible.

DATE ESTABLISHED

9 June 1954, boundaries amended 5 April 1973.

ALTITUDE:

50 - 200 metres above sea level.

AREA:

1,090 ha - reduced from 6,080 ha in 1973.

LAND TENURE

Public ownership but much cultivation by squatters from within town boundary. There is political pressure to return the land to the original customary owners.

PHYSICAL FEATURES AND VEGETATION

A hilly area of numerous ridges and valleys, about half grassland and half secondary forest dominated by the introduced tree Brousonettia papyrifera in many places.

NOTEWORTHY FAUNA

Very few animals, but numerous species of birds.

AREAS EXCLUDED

Seven bird sanctuaries situated on small islands on groups of islands established under the Wild Birds Protection Act (Cap 89).

TOURISM

The Park is close to the capital of Honiara, and access is by tarsealed road, built across Mount Austen to the Lunga Valley to serve the proposed hydro electricity dam site. Off the road access by tracks and footpaths.

RESEARCH

No special organisation except for forestry planting trials on a small block.

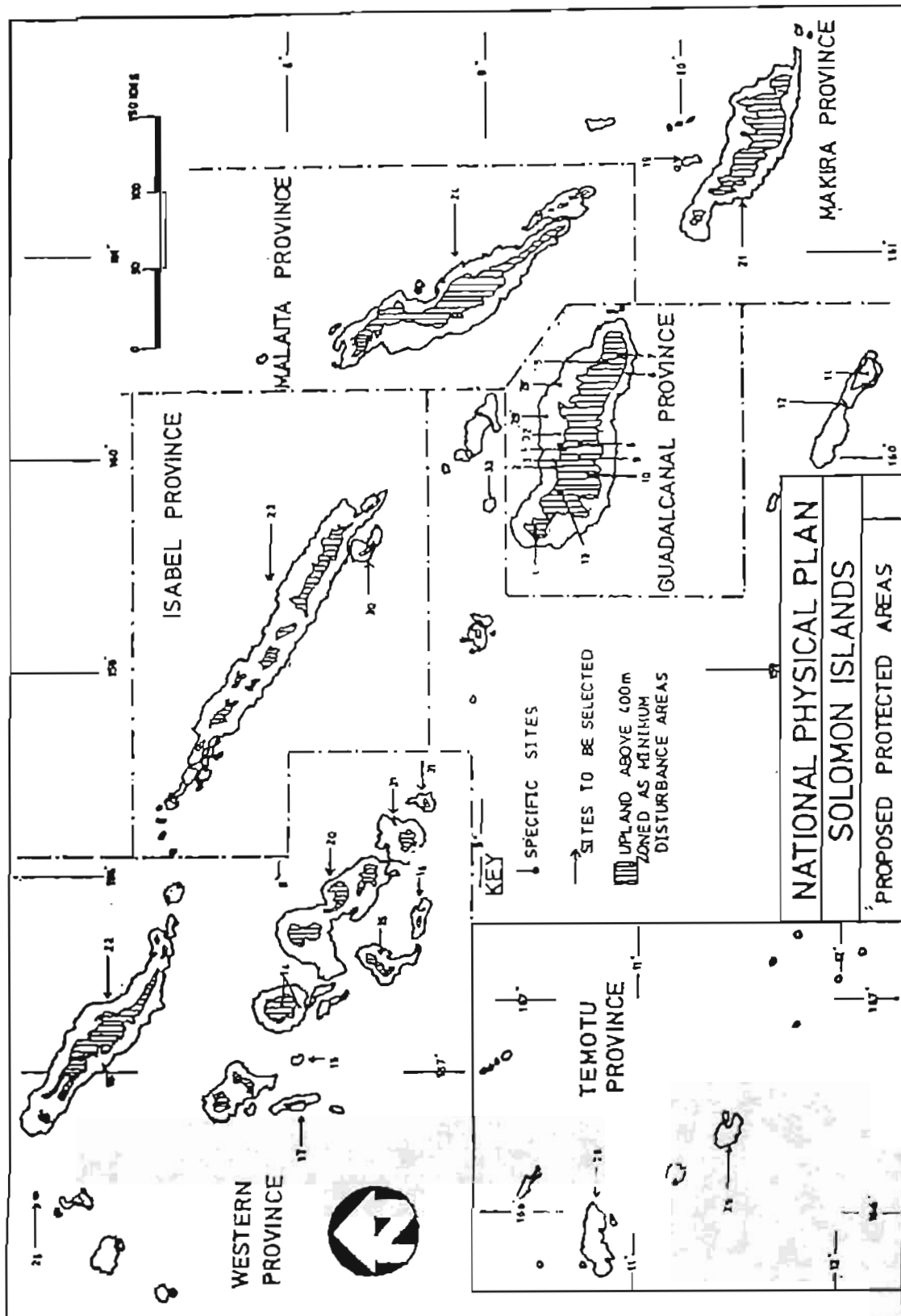
STAFF:

One Forest Ranger does part-time forestry experimental work in the Park.

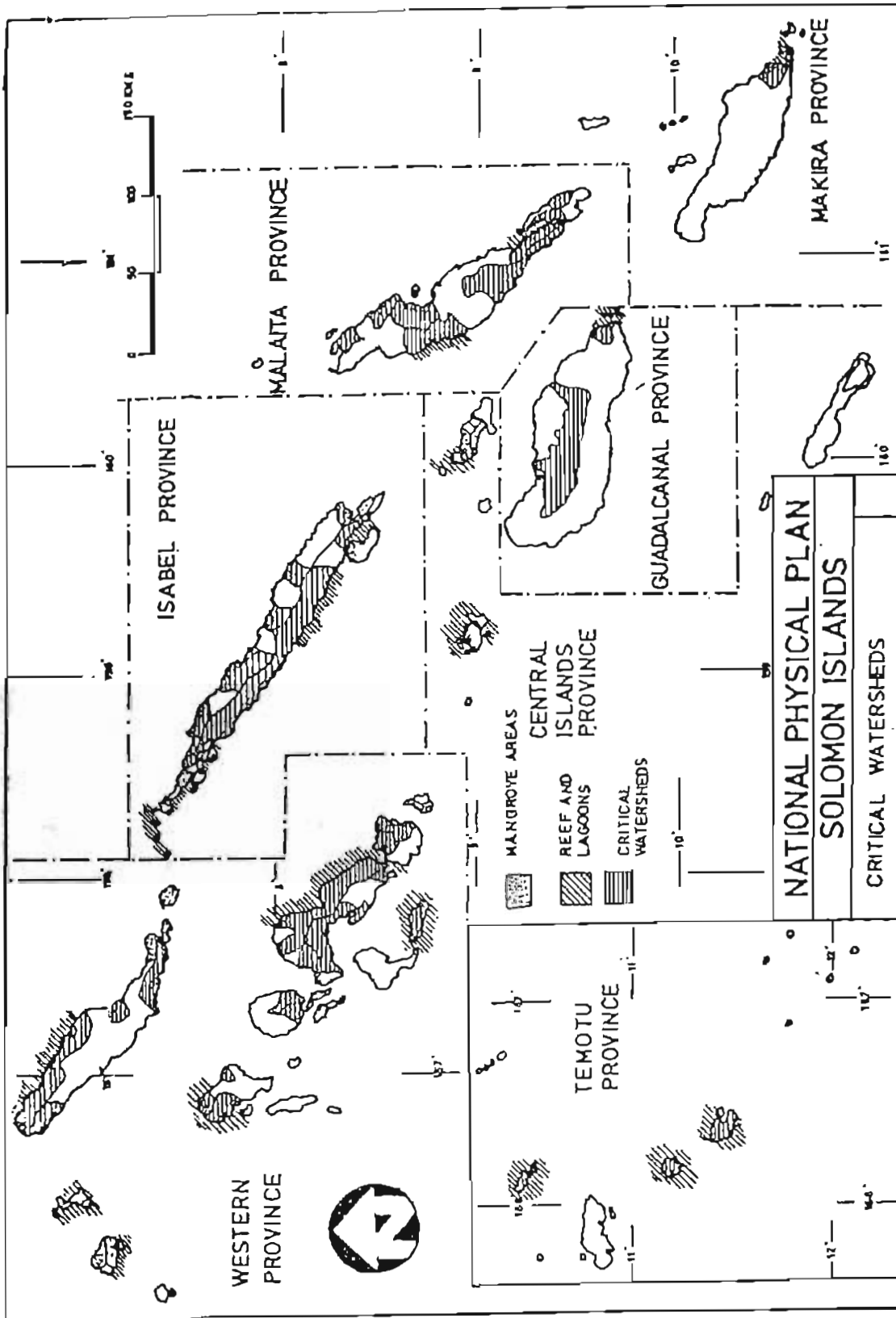
BUDGET:

Nil.

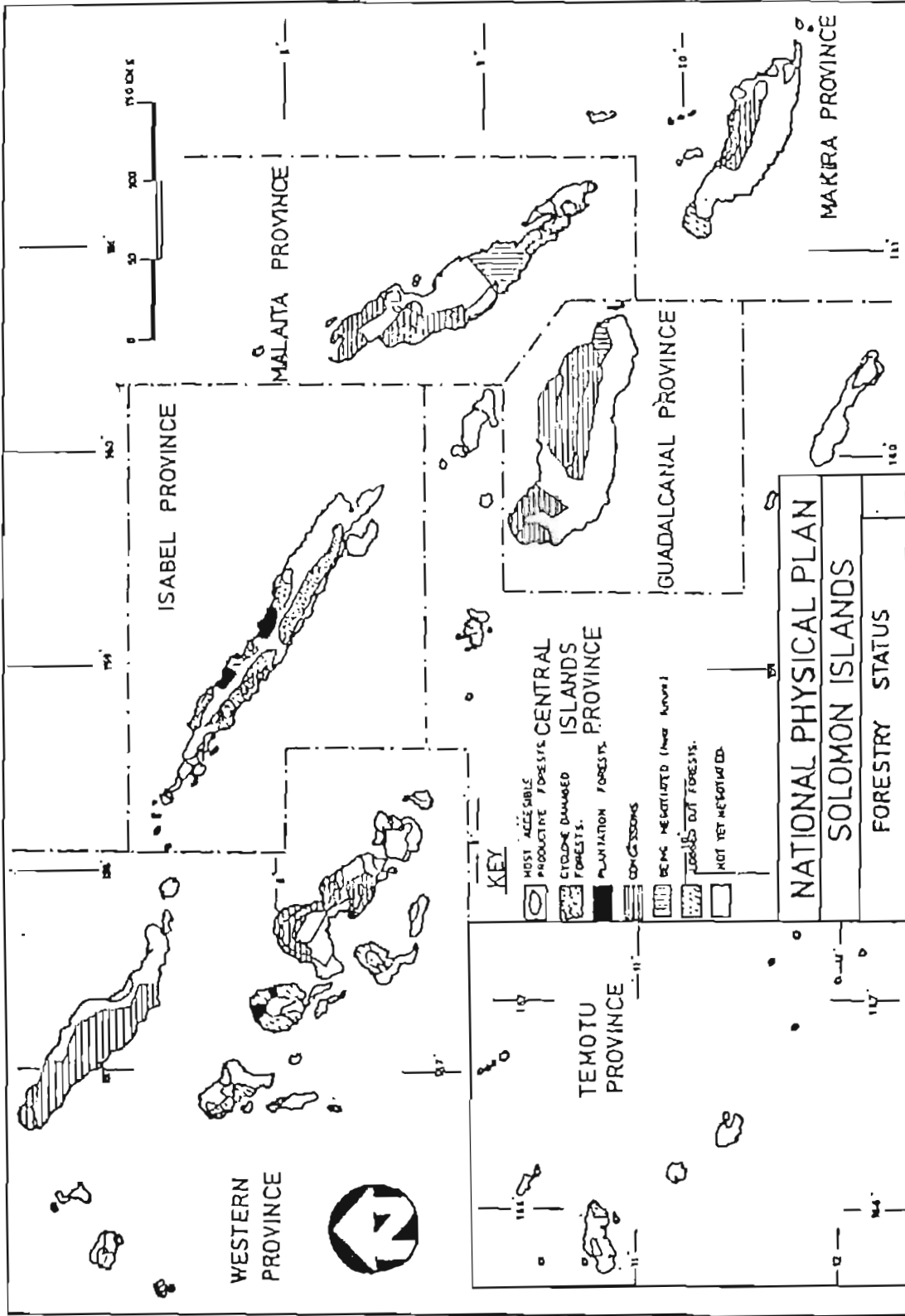
MAP 1.



MAP 2.



MAP 3



TOKELAU

INTRODUCTION

Tokelau comprises three small atolls namely Atafu, Nukunonu and Fakaofu. Each atoll consists of a number of reef-bound islets encircling lagoons. These islets vary in length from 90 metres to 6 kilometres and in width from a few metres to 200 metres. At no point do they rise higher than 5 metres above sea level.

The total land area is only 12.25 sq. km. Nukunonu, the biggest atoll, is 4.7 sq km, Fakaofu is 4.0 sq km and Atafu 3.5 sq km.

Tokelau has an average mean temperature of 28°C. Rainfall is heavy but irregular. Severe storms have on occasion caused widespread damage, but no such disasters have affected Tokelau during the past four years.

The population census of 2 November 1981 recorded a population of 1572. Atafu has a total of 554, (273 males and 281 females). Nukunonu has a total of 368 (188 males and 180 females) and Fakaofu has a total of 650 (316 males and 334 females). An informal head count in October 1984 showed a total population of 1627.

GENERAL INFORMATION

Tokelau has no protected area system and no history of conservation policies as such. Conservation of Tokelau's national resources has so far been achieved through traditional practices. On atolls where the ecosystems are very delicate, ecological errors can hardly be tolerated. Therefore the need to take conservation precautions is amplified. The Agriculture and Fisheries committee, formed last year, identified conservation measures as one of its objectives. Discussions were focussed on the recent severe depletion of clams (*Tridachna*) and the gradual decline in the sea turtle population. Representatives on the committee from the three island councils were encouraged to impose measures to reduce the rate of uncontrolled harvesting of the clam and to improve conservation practices for the sea turtle. At Atafu the Council of Elders has placed a ban on the taking of turtle eggs, except for a few that are allowed to be removed for the purpose of hatching a pet turtle. Fakaofu and Nukunonu placed a ban on harvesting the clam, to be reviewed after one year.

The only international agreement in which Tokelau has been involved is with the American Tunaboat Association (ATA). At the request of the Elders in Tokelau a special provision was included in the agreement to protect traditional fishing areas and the migration routes between the 3 atolls from ATA fishing.

With the steps taken by Tokelau Councils to replenish the stocks of the above-mentioned species, we are more aware than before of the need for Tokelau to draw up a plan for protected areas and conservation.

Address for contact:

Director of Administration
Office of Tokelau Affairs
P.O. Box 865,
Apia
Western Samoa.

TONGA

PART I - GENERAL REPORT

INTRODUCTION

The Kingdom of Tonga is an independent island nation in the South Pacific and is located between latitudes 150°S and 23.5°S and longitudes 173°W and 177°W. The total land area of the Kingdom's 171 islands, of which 36 are inhabited, is 750 km² spreading over 360,000 km² of ocean. The main island groups are Tongatapu with 256m², Ha'apai with 119 km² and Vava'u with 143 km² in area. (See Map 1).

The total population according to the 1976 Census was 90,000. In 1984 the total population was estimated to be more than 104,000 of which over 70,000 lived in Tongatapu; 16,000 lived in Vava'u; 9,700 in Ha'apai and more than 5,000 in 'Eua. The annual population growth rate was estimated to be less than 2%.

Tongans, like most Pacific Islanders, have always lived close to the land and the sea. The rich soil of Tonga and the numerous reefs which surround the islands have provided abundant food for its people. The plants, animals and scenery provided inspiration for poetry, legends and love songs. The natural environment is the source of the "fiemalie", the feeling contentment and relaxation, which Tongans treasure. Tonga, is now involved in extensive agricultural, fisheries and economic development. These projects must follow a rational and planned programme in which their environmental effects are considered.

The establishment of marine and terrestrial parks is timely and essential before irreparable damage occurs and priceless natural resources are lost forever. Since the second South Pacific Conference on National Parks and Reserves held in Australia 1979, Tonga has made considerable progress in environmental legislation and in stimulating environmental awareness within the country.

CONSERVATION POLICY

The concept of parks and reserves is not new to Tonga. Almost 40 years ago, in 1946, 'Ata, the then Minister of Lands, gazetted a park reserve at Haveluloto along the shores of Fanga'uta Lagoon. This demonstrates foresight on the part of the Tongan government, and sets the legal precedent of parks and reserves administration coming under the Ministry of Lands.

In 1972, King Taufa'ahau Tupou IV declared two reserves, one at Mui Hopohoponga and the other at the Ha'amonga Trilithon. Mui Hopohoponga is a 2km stretch of beach on the extreme eastern end of Tongatapu. The Ha'amonga Trilithon, the Stone Henge of the South Pacific, is a 23 hectare reserve.

The Ha'amonga consists of two upright stones 5m high which weigh 30 to 40 tonnes, and a cross piece 6m in length. It was built by the famous Tui'i Tonga, Tu'itatui, about the year 1200 AD. At the request of the present King of Tonga, who is a descendant of Tu'itatui, the Ha'amonga was surveyed using stellar and solar sightings. At 7.14 am on December 22, 1968, the sun rose at the exact point on the horizon at the points predicted by the marks on the lintel.

Under the Parks and Reserves Act of 1976, Tonga has gazetted two national parks which comprise the entire islands of Monuafe and Malinoa and five marine reserves. Two reserves are the reefs which surround the islands of Malinoa and Monuafe, and the other three are reefs at Pangaimotu, Hakaumama'o and Ha'atafu.

Tonga will soon have a major terrestrial park on the island of 'Eua which lies 19 km south south east of Nuku'alofa. 'Eua is 20 km long and 7 km wide. It is lightly settled and developed and geologically is the oldest island in Tonga and possesses the most extensive, undisturbed natural habitats in the Kingdom.

The proposed national park on the east side of the island encompasses, 1,400 hectares and four major habitats: the ringing reef, the coastal region, the eastern ridge and the ridge summit. The reef is on the windward side of the island, is subject to extensive wave exposure and consists of terraced pools ringed by the corraline algae *Lithoamnion* sp. The outstanding feature of the coastal region is the Matalanga-'a-Maui with a natural bridge made of limestone 240 feet thick. Here the roof of a wave-formed cave has collapsed leaving a chasm 750m in diameter. The eastern ridge rises abruptly from the ocean and the limestone cliffs are interrupted by volcanic terraces giving a staircase effect. The terraces are densely forested and streams and waterfalls cut across the cliffs providing majestic scenery.

The park in 'Eua, protects several species of plants and animals indigenous to the island. The park includes five indigenous species of plants and several species which are found in Tonga and Samoa, or Tonga and Fiji only. The park also contains some of the last stands of sandalwood in the South Pacific.

Isolated islands have small populations of birds which are very sensitive to changes in their environment such as those caused by agricultural development or the introduction of predators and competitors. Many species of birds endemic to the islands of the South Pacific have become extinct, for example, the Hawaiian and Society Islands have lost 50% of their avifauna already.

Of the 47 species of birds known to occur in Tonga, several are no longer found on certain islands. Some of Tonga's birds such as the fruit doves, *Ptilinopus porphyraceus* and *P. perousii*, and the red-breasted musk parrot, *Posopeia tabuensis*, are only found in Tonga and the nearby islands of Fiji and Samoa. Of the 47 species of birds found in Tonga, twenty-four occur in 'Eua. The most striking are the brightly-coloured parrot, the elegant white-tailed tropic bird, *Phaeton lepturus*, and the Pacific pigeon, *Ducula pacifica*, called "Lupe" in Tongan. The "Lupe" plays an important role in Tongan love songs, literature and tradition. Once abundant, its numbers are dwindling. It is hoped that the park on 'Eua will qualify for international recognition as a IUCN "Island for Science Reserve".

We will propose that the entire island of 'Ata becomes a Biosphere reserve under the "Man and Biosphere" programme.

Tonga is also considering several national historical parks to preserve sites of archaeological, cultural and historical importance. These include:

Pouono National Historical Park

In 1839, Tupou I, the first King of Modern Tonga, proclaimed the Code of Vava'u, the first written law of Tonga and the basis of the present constitution. Topou I picked up a handful of soil and tossed it into the air and said "Koe 'Otua mo Tonga ko Hoku Tofia" which means: "God and Tonga are my inheritance". This is the national motto and a source of great pride to all Tongans.

Kanokupolu National Historical Park

In 1631, while sitting under a koka tree (*Bischofia javanica*), Ngata was crowned the first Tui'i Kanokupolu and founded the house of Tupou, the present ruling family. Part of the original koka tree is incorporated into the throne in the Royal Chapel.

Captain Cook's Landing Place

On 26th June, 1777, Captain Cook landed in Tonga and observed the solemn ceremony of presenting the first fruits to the Sacred King, the Tui Tonga. He landed at the banyan tree at 'Alaki called the Malumalu-o'-Fulilangi.

Langi Mu'a National Historical Park

In the ancient capital of the Tui'i Tonga dynasty at Mu'a, there are 28 tombs of the royal families which are huge stepped pyramids faced with large blocks of coral stone. The most magnificent is the Langi Paepae-'o-Tele'a which is 41m long, 28m wide and 2.5m high. One "L" shaped corner-stone is 6.5m long on one side and 2m long on the other. This langi was probably built by the Tui'i Tonga, Tele'a.

ENVIRONMENTAL LEGISLATION

The Kingdom has enacted several pieces of legislation to manage and protect the natural and cultural resources of Tonga.

The Bird and Fish Preservation Act

This act limits or prohibits the catching or injuring of certain species of fish, birds and turtles and establishes the legal authority to fine, imprison and confiscate equipment used in catching protected animals. Hunting of turtles during the summer breeding season of November, December and January is prohibited, and hunting of the leather-back turtle (*Dermochelys coriacea*) is prohibited altogether. Under this Act, the two major lagoons of Tongatapu, Fanga'uta and Fangakakau are protected as areas of environmental importance. Fish traps, damaging the mangroves, drilling, dredging or discharge of any effluent are prohibited. These lagoons are important sites of fish breeding.

The Preservation of Objects of Archaeological Interest Act 1969

This Act protects the archaeological, cultural and historic resources of Tonga. All excavations and investigations must be approved by the Tonga Tradition Committee and no object of archaeological interest may be removed from the Kingdom, temporarily or permanently, without a permit from the Committee. Within two years, all investigations must produce a published scientific report.

The Tourist Act 1976

This Act established the Tonga Tourist Board and the Tonga Visitors Bureau to develop tourism for the benefit of all Tongans and to licence, regulate and control the tourist industry.

The Parks and Reserves Act 1976

This Act established the Parks and Reserves Authority to protect, manage and develop natural areas in the Kingdom. According to the Act "Every park subject to any conditions and restrictions which the Authority may impose, shall be administered for the benefit and enjoyment of the people of Tonga and there shall be freedom of entry and recreation therein by all persons. Every reserve, subject to any conditions and restrictions which the Authority may impose, shall be administered for the protection, preservation and maintenance of any valuable feature of such reserve and activities therein and entry thereto shall be strictly in accordance with any such conditions and restrictions:.

PARKS AND RESERVES ADMINISTRATION

Under the Parks and Reserves Act of 1976, a Parks and Reserves Authority was established within the Ministry of Lands, Survey and Natural Resources to protect, manage and develop natural areas in the Kingdom. The Authority is headed by an Ecologist and Environmentalist who is directly responsible to the Superintendent of Lands, Survey and Natural Resources. There are also two Park Rangers directly responsible to the head of the Authority.

In addition to the general administration of parks and reserves, the Authority is also responsible for environmental impact assessment of all physical developments, physical planning and environmental education. A notable recent achievement in environmental education has been the implementation of a National Environment Awareness Week in the first week of June each year for the past three years. See Appendix 1 for the programme.

CONCLUSION

Tonga's interest in conservation and National parks was sparked by the Hon. Baron Tuita, Minister of Lands, Survey and Natural Resources, who attended the first South Pacific Conference on National Parks and Reserves held in Wellington in 1975. Since then, Tonga has enacted legislation, protected certain areas and began the process of public education. We are optimistic about the parks and the influence they will have on the future of Tonga.

APPENDIX 1.

PROGRAMME FOR THE NATIONAL ENVIRONMENT AWARENESS WEEK
JUNE 23 - 7, 1985

Sunday 2 June

All religious denominations are requested to stress the importance of environmental conservation in their morning services.

Monday 3 June

A National Tree Planting Day in which all api holders are asked to plant a tree of their own choice but preferably something to enhance the natural environment. The Forestry division of the Ministry of Agriculture has agreed to supply seedlings free of charge and these will be picked up from specific locations throughout the country. The old replanting programme of the Norfolk pines on Tu'i Road will also be completed.

Tuesday 4 June

Singing competition for Primary School Children at the Fa'onelua Tropical Garden and the theme of the competition is the conservation and enhancement of the environment. Prizes will be given.

Displays on various issues relevant to environmental management will also be staged at Fa'onelua Garden for the general public to observe. Any queries with respect to these displays will be very much appreciated.

Wednesday 5 June

National Clean-up Day for the whole Kingdom and all people including schools, churches, Government ministries/Departments, local businesses, quasi government boards and private clubs are asked to participate in the cleaning-up programme.

Thursday 6 June

Panel discussion over the air on the topic "Is it worthwhile conserving the natural environment?" Members will be invited from various Government ministries/Departments.

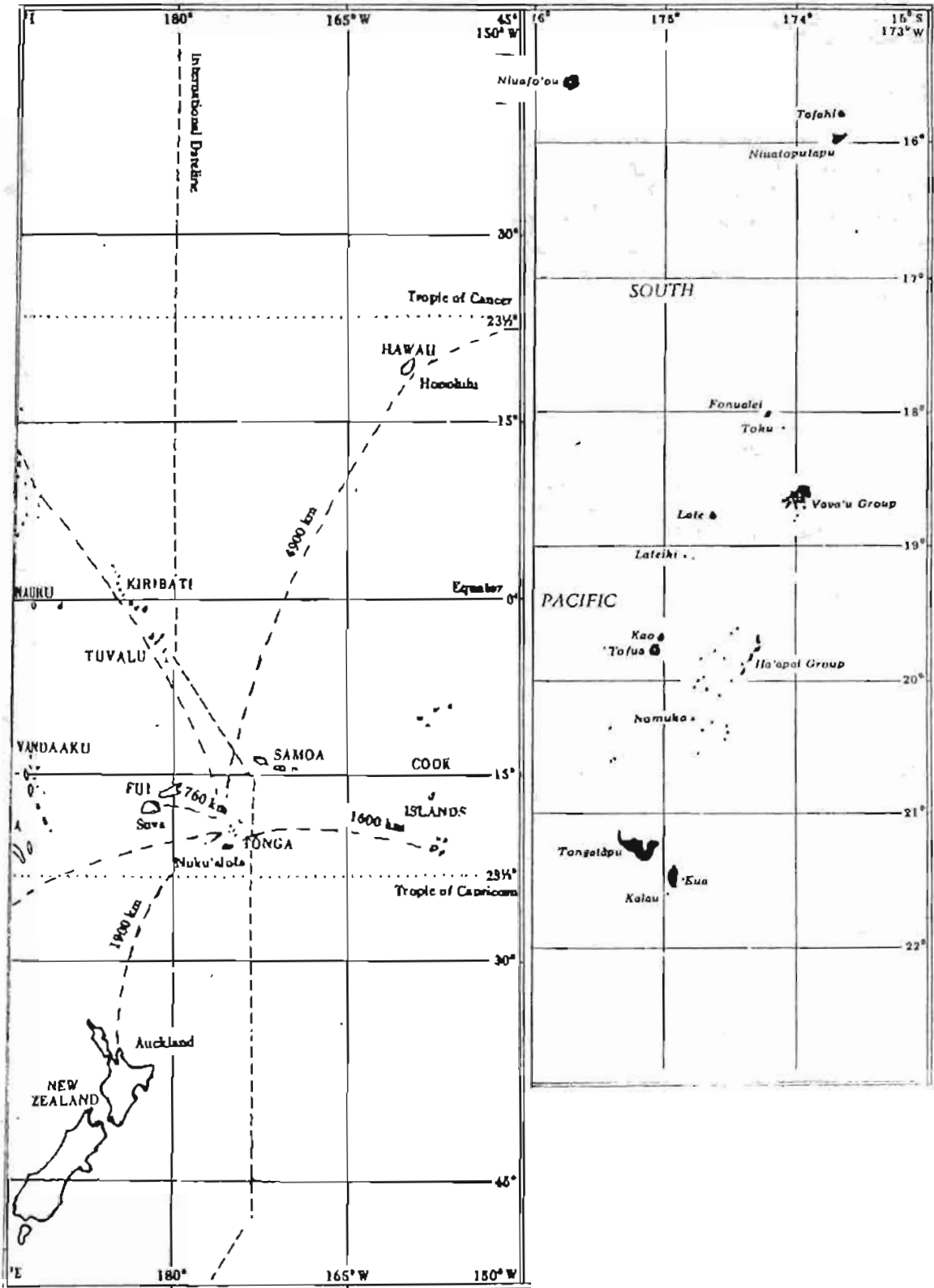
Friday 7 June

Presentation of prizes for the winners of the Essay Writing Competition for Secondary School Children. The winning essay will be published in the Friday's edition of the local newspaper, the Tonga Chronicle.

In the evening, a closing-address will be made by the Hon. Minister of Lands, Survey and Natural Resources, the Hon. Baron Tuita.

MAP 1.

THE KINGDOM OF TONGA



VANUATU

PART I : GENERAL REPORT

INTRODUCTION

The Anglo-French Condominium of the New Hebrides became the independent Republic of Vanuatu on 30 July 1980. It consists of a chain of islands which form a single archipelago running southwards from a latitude of 13 degrees south for a distance of 800 kilometres. Its land area is 12,189 square kilometres comprises of 12 main and some 60 smaller islands, the largest being Espiritu Santo, Malekula and Efate. Port Vila, the capital, is situated on Efate. (See Map 1.)

The total population is approximately 130,000 of which an estimated 16,000 families farm the land. Custom and land are an integral part of life and despite the changes which development and progress have brought, both are as important now as they were 100 years ago. The Constitution requires that the rules of custom shall form the basis of ownership and use of land. It also stresses that every person shall have a fundamental duty to himself and his descendents and to others to safeguard the national wealth, resources and environment in the interests of the present generation and future generations.

POLICY

Vanuatu has not yet established its policy on environmental issues. At present two Ministries are closely involved with the subject - the Ministry of Lands, Energy and Rural Water Supply is responsible for "the environment and its conservation", and the Ministry of Home Affairs for "town and country planning". Overseas recruitment is currently in hand for an Environmental Officer and a Physical Planner.

Government is also considering initiatives in environmental assessment and administration. There are a number of donor agencies which are keen to support consultancies and approaches are proposed through the South Pacific Regional Environment Programme (SPREP). A course on Training for Rural Environmental Management, involving 10 to 12 participants is under consideration.

A small number of protected areas have been identified. These are predominantly coastal areas set aside for public recreation. They are detailed under the List of Protected Areas in this review.

LAW

Prior to independence the French, British and Condominium Governments owned numerous parcels of land throughout the country. These were known as state land and at independence the Land Reform Regulation No. 31 of 1980, which was brought into force on the day of Independence, ruled that all state land should vest in the Vanuatu Government and be public land for the benefit of the Republic. A significant number of these parcels were maritime zones which comprised long distances of coastal land about 100 metres wide.

Government policy on this ex-state land is to surrender as much as possible back to the customary owners. Only land which contains a Government asset such as a school or a clinic or which has development potential of national significance, is normally retained. However, in addition Government also gives consideration to areas which offer recreational benefits and a number of shoreline areas have been retained and accorded the protection of public land for public recreational purposes.

The Land Reform Regulation also empowers the Minister responsible for lands to declare any land to be public land. This is only done on the advice of Council of Ministers and after consultation with the customary owners. Following requests by the Local Government Council, proposals are being considered to declare some areas on the island of Espiritu Santo to be public land. Again these are to be used for recreational purposes.

Under Section 20 of the Fisheries Act No. 37 of 1982, the Minister responsible for fisheries may, after consultation with owners of adjoining land and with the appropriate local government council, declare any area of Vanuatu waters and the seabed underlying such waters, to be a marine reserve. On 18th November 1983 an order was made declaring an area off the south coast of Espiritu Santo Island to be a marine reserve. This area includes the wreck of the war-time troop ship "President Coolidge" which was sunk and now lies on the sea bed.

Section 21 of the Forestry Act No. 14 of 1982, makes provision for management, control and protection of land for certain purposes. This enables the Minister responsible for forestry to forbid or restrict clearing or other activities and provide management, control and protection of areas to preserve the ecology or conserve the land for a specific purpose. Proposals are being considered to apply this law to an area of indigenous forest on Erromango Island where a limited number of island Kauri trees exist.

The contribution made by traditional custom and practices towards protected area and conservation objectives, has yet to be assessed. It is however, expected to be significant. For example it is known that seasonal custom tabus are applied in certain coastal waters where fish are known to gather for breeding. This ensures that harvest elsewhere can be sustained. Also an important archaeological site on Eretoka Island is protected by custom tabus. There is, therefore, undoubtedly a need to tap this custom knowledge.

PARKS AND RESERVES ADMINISTRATION

Orders under the Land Reform Regulation are made by the Minister of Lands, Energy and rural Water Supply and are applied by staff of the Department of Lands. Any land survey requirements are undertaken by the Department of Land Surveys. The need to physically manage public land which is used for recreational purposes has not yet arisen, but it is likely that on Espiritu Santo, this duty will fall to the local government council.

The Luganville branch of the Fisheries Department is responsible for policing the marine park off Espiritu Santo where there is a complete ban on fishing and on the removal of any coral or other marine life. The wreck of the President Coolidge attracts a large number of scuba divers to the park. These mostly come from overseas.

The Department of Agriculture and Forestry will be responsible for the management and control of the proposed forest reserve on Erromango Island.

ADDRESSES

Recreational Reserves (public land).

- a. Department of Lands
Ministry of Lands, Energy and Rural Water Supply
P.O. Box 151,
Port Vila.
- b. Department of Local Government
Ministry of Home Affairs
P.O. Box 156
Port Vila.

Marine Parks

Department of Fisheries
 Ministry of Agriculture, Fisheries and Forestry
 P.O. Box 129
 Port Vila

Forestry Reserves

Department of Agriculture and Forestry
 Ministry of Agriculture, Fisheries and Forestry
 P.O. Box 129
 Port Vila

LIST OF PROTECTED AREAS

Recreational Reserves

- a. Title No. 1258
 Situated on the Island of Efate
 Extent : 39 hectares
 Description: Maritime zone predominantly sand beach.
- b. Title Nos. 386 (part) 388 (part)
 Situated on the Island of Aore
 Extent : 20 hectares approximately.
 Description: Maritime zone predominantly sand beach.
- c. Title No. 414
 Situated on the Island of Aore
 Extent : 37 hectares
 Description: Maritime zone predominantly sand beach.
- d. Title No. 830
 Situated on the Island of Malo
 Extent : 11 hectares
 Description: Maritime zone predominantly sand beach.

Marine Parks

An area of waters situated off the coast of the island of Espiritu Santo.

Extent: 3 square miles

Description: Off Million Dollar Point in the Second Channel, the area includes the wreck of the American troop ship "President Coolidge". This sank in 1942 when it accidentally struck a US mine. It is a large vessel which lies with its bow section in 60 feet of water and its stern in 240 feet.

LIST OF PROPOSED PROTECTED AREAS

Forest ReservesTitle No. J708 (part)

Situated on Island of Erromango

Extent: 500 hectares minimum

Description: An area of indigenous forest which contains a limited number of trees of the island kauri species (*Agathis Mecrophyllia*). The object of creating the reserve is to study the ecology of the species in its natural habitat and to maintain a seed supply.

Recreational Reserves

A joint request has been made by the Santo/Malo Local Government Council and the Santo Land Council for nine coastal areas to be declared public land for recreational purposes. Seven of these are on the island of Espirtu Santo and two are on Malo Island. Government has signified its approval subject to agreement by the local land owners.

Details are as follows:

Santo

- i) Title No. 899 Malau Island 3 hectares
- ii) Title No. 479 (part) Saraoutou, two parcels of approximately 5 hectares and 8 hectares.
- iii) Title 381 (part) Palikulo approximately 10 hectares.
- iv) Title 601 (part) Ratard Plantation two parcels of approxiamtely 10 hectares and 12 hectares.
- v) Title 989 (part) Venue River approximately 8 hectares.

Malo

- i) Titles 709 and 710 (part of each) Asuleka Island approximately 5 hectares.
- ii) Title 706 (part) approximately 40 hectares.

PROBLEMS, NEEDS AND PROSPECTS

With Vanuatu now striving for economic independence, economic considerations inevitably tend to dominate all development projects. National parks and reserves unfortunately don't score well in this respect and tend to be regarded as a luxury the country can't afford. This is undoubtedly a misconception but nevertheless it is fairly widespread and there is a need to educate and convince Government Ministries, local government authorities, custom land owners and people in the private sectors that if our natural resources and environment are to be safeguarded, then the creation of parks and reserves are a vital essential, not an extravagance.

Lack of expertise for natural resources management and environmental protection is a very real problem. It can only be solved by imported technology and this is already under consideration. However, it is a subject which in view of the strong element of Ni-Vanuatu custom in terms of custom resources ownership, will require very careful selection and control.

Despite the importance of parks and reserves, financial costs are inevitably a problem. Again to solve this we will have to look to overseas donors but perhaps the expense may not be as great as we fear. We are also certain that early investment in environmental protection is always a lot cheaper than trying later to repair damage incurred through neglect or omission.

PART II: INFORMATION ON PROTECTED AREAS

NAME OF AREA: Title No. 1258 - Whitesands-Efate

MANAGEMENT CATEGORY Recreational Reserve

LEGAL PROTECTION

Not yet established but complete protection of vegetation and natural environment intended.

DATE ESTABLISHED 27th December, 1984

GEOGRAPHICAL LOCATION

Longitude: 168°25'E. Latitude: 18° 12'S. Approximately 15 km from Port Vila town by direct line.

ALTITUDE: Sea level.

AREA: 39 hectares

LAND TENURE: Government owned.

PHYSICAL FEATURES

Coral formation with sandy beaches. Rainfall 2,500mm to 4,000mm per year. Temperature: 18°C to 33°C.

VEGETATION:

Coastal trees (common species, e.g. *Barringtonia*, *Calophyllum* and *Terminalia*) with epiphytic ferns and orchids and strand plants.

NOTEWORTHY FAUNA Only common species as far as is known.

CULTURAL HERITAGE None known.

LOCAL POPULATION Nil

ZONING Nil

CONSERVATION MANAGEMENT

Enactment and enforcement of local by-laws to prohibit litter, damage to vegetation and the construction of unauthorised buildings.

DISTURBANCES AND DEFICIENCIES

Lack of controlling legislation and personnel to prevent littering and damage to vegetation.

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIAL Nil

STAFF Nil

BUDGET Nil

LOCAL ADMINISTRATION

Secretary
Efate Local Government Council
P.O. Box 202
Port Vila

MAP: See attached Maps, 1, 2 and 3.

NAME OF AREA: Title Nos. 386 and 388 Bucaro Aore

MANAGEMENT CATEGORY Recreational Reserve

LEGAL PROTECTION
Not yet established but complete protection of vegetation and natural environment intended.

DATE ESTABLISHED 20th September, 1984

GEOGRAPHICAL LOCATION
Longitude: 167° 13' E. Latitude: 15° 33'S. Approximately 4 km from Luganville town by direct line.

ALTITUDE: Sea level.

AREA: 20 hectares

LAND TENURE: Government owned.

PHYSICAL FEATURES
Coral formation with sandy beaches. Rainfall 2,500mm to 4,000mm per year. Temperature: 18°C to 33°C.

VEGETATION:
Coastal trees (common species, e.g. *Barringtonia*, *Calophyllum* and *Terminalia*) with epiphytic ferns and orchids and strand plants.

NOTEWORTH FAUNA Only common species as far as is known.

CULTURAL HERITAGE None known.

LOCAL POPULATION Nil

CONSERVATION MANAGEMENT
Enactment and enforcement of local by-laws to prohibit litter, damage to vegetation and the construction of unauthorised buildings.

ZONING Nil

DISTURBANCES AND DEFICIENCIES
Lack of controlling legislation and personnel to prevent littering and damage to vegetation.

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIAL Nil

STAFF Nil

BUDGET Nil

LOCAL ADMINISTRATION Secretary
Santo/Malo Local Government Council
P.O. Box 239,
Luganville

MAPS See attached Maps 1, 2 and 3.

NAME OF AREA: Title No. 414 Aore

MANAGEMENT CATEGORY Recreational Reserve

LEGAL PROTECTION
Not yet established but complete protection of vegetation and natural environment intended.

DATE ESTABLISHED 20th September, 1984

GEOGRAPHICAL LOCATION
Longitude: 167° 7' E. Latitude: 15° 36'S. Approximately 11 km from Luganville town by direct line.

ALTITUDE: Sea level.

AREA: 37 hectares

LAND TENURE: Government owned.

PHYSICAL FEATURES
Coral formation with sandy beaches. Rainfall 2,500mm to 4,000mm per year. Temperature: 18°C to 33°C.

VEGETATION:
Coastal trees (common species, e.g. *Barringtonia*, *Calophyllum* and *Terminalia*) with epiphytic ferns and orchids and strand plants.

NOTEWORTH FAUNA Only common species as far as is known.

CULTURAL HERITAGE None known.

LOCAL POPULATION Nil

CONSERVATION MANAGEMENT
Enactment and enforcement of local by-laws to prohibit litter, damage to vegetation and the construction of unauthorised buildings.

ZONING Nil

DISTURBANCES AND DEFICIENCIES
Lack of controlling legislation and personnel to prevent littering and damage to vegetation.

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIAL Nil

STAFF Nil

BUDGET Nil

LOCAL ADMINISTRATION Secretary
Santo/Malo Local Government Council
P.O. Box 239,
Luganville

MAP See attached Maps 1, 2 and 3.

NAME OF AREA: Title No. 830 Naomebaravu-Malo

MANAGEMENT CATEGORY Recreational Reserve

LEGAL PROTECTION
Not yet established but complete protection of vegetation and natural environment intended.

DATE ESTABLISHED 20th September, 1984

GEOGRAPHICAL LOCATION
Longitude: 167° 15' E. Latitude: 15° 44'S. Approximately 20.5 km from Luganville town by direct line.

ALTITUDE: Sea level.

AREA: 11 hectares

LAND TENURE: Government owned.

PHYSICAL FEATURES
Coral formation with sandy beaches. Rainfall 2,500mm to 4,000mm per year. Temperature: 18°C to 33°C.

VEGETATION:
Coastal trees (common species, e.g. *Barringtonia*, *Calophyllum* and *Terminalia*) with epiphytic ferns and orchids and strand plants.

NOTEWORTH FAUNA Only common species as far as is known.

CULTURAL HERITAGE None known.

LOCAL POPULATION Nil

CONSERVATION MANAGEMENT
Enactment and enforcement of local by-laws to prohibit litter, damage to vegetation and the construction of unauthorised buildings.

ZONING Nil

DISTURBANCES AND DEFICIENCIES
Lack of controlling legislation and personnel to prevent littering and damage to vegetation.

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIAL Nil

STAFF Nil

BUDGET Nil

LOCAL ADMINISTRATION Secretary
Santo/Malo Local Government Council
P.O. Box 239,
Luganville

MAP See attached Maps 1, 2 and 3.

NAME OF AREA President Coolidge Marine Park, Espiritu Santo

MANAGEMENT CATEGORY National Park

LEGAL PROTECTION
Complete protection of all marine life and the wreck with all its content.

DATE ESTABLISHED 18th November 1983

GEOGRAPHICAL LOCATION
Longitude: 167° 13'E. Latitude: 15° 31'S. Approximately 6 km from Luganville town by direct line.

ALTITUDE: Sea level.

AREA: 3 square miles.

LAND TENURE Part customary and part Government owned.

PHYSICAL FEATURES Under-water coral reef and sea bed.

VEGETATION Not applicable.

NOTEWORTHY FAUNA Only common species as far as is known.

CULTURAL HERITAGE None known

LOCAL POPULATION Nil

CONSERVATION MANAGEMENT
Enforcement of controls to ensure that marine life and contents of the wreck remain unharmed and undisturbed.

ZONING: Nil

DISTURBANCES AND DEFICIENCIES
Minor incidents of fish poaching and the removal of objects from the wreck occur which are difficult to police owing to shortage of staff.

SCIENTIFIC RESEARCH Nil

SPECIAL SCIENTIFIC FACILITIES Nil

PRINCIPAL REFERENCE MATERIAL U.S. World War II records.

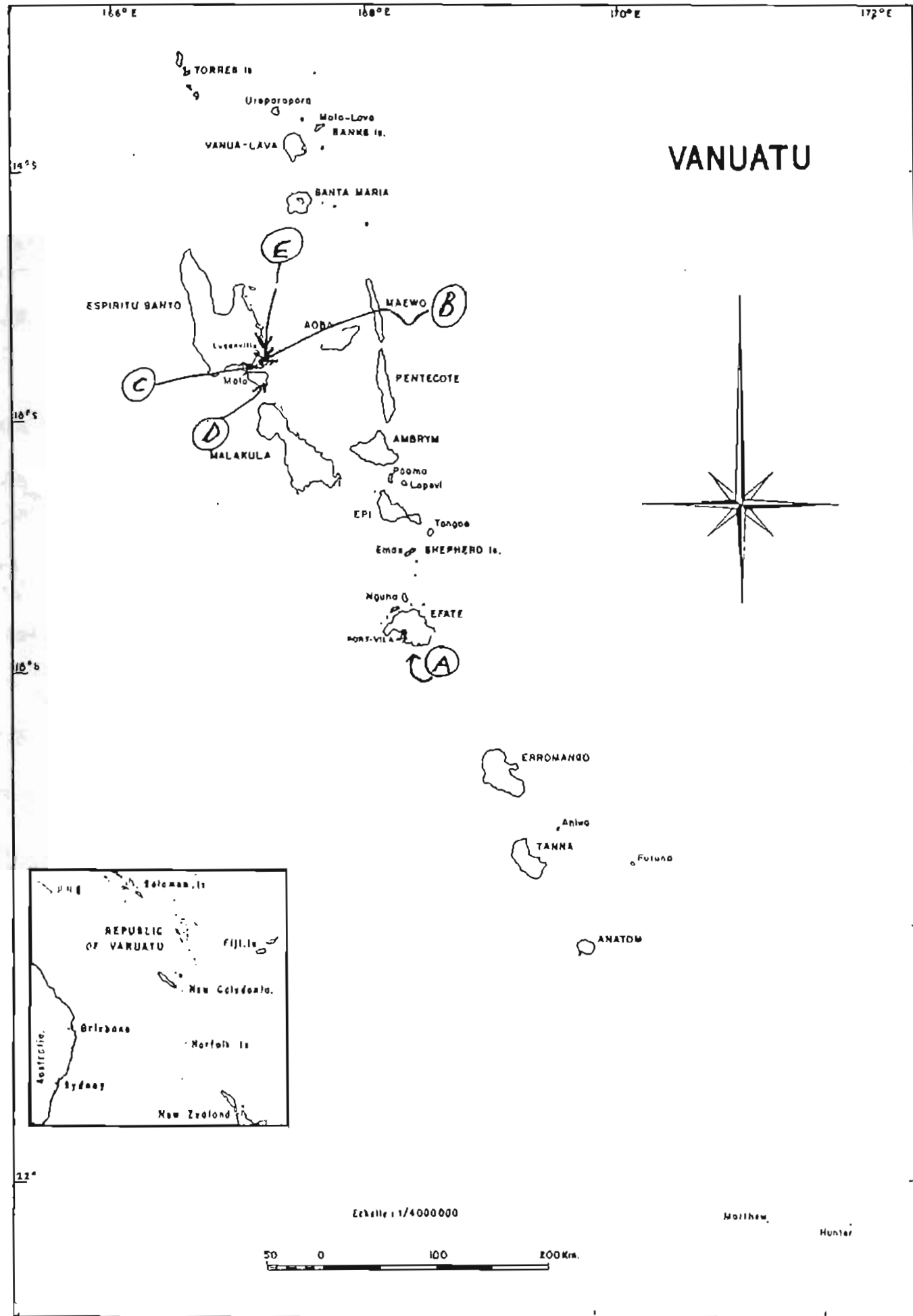
STAFF:
Occasional coverage by Department of Fisheries staff.

BUDGET: Nil

LOCAL ADMINISTRATION: Secretary,
Santo/Malo Local Government Council
P.O. Box 239,
Luganville

MAP See attached Maps 1, 2 and 3.

MAP 1.



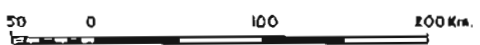
VANUATU

14° S
16° S
18° S

166° E 168° E 170° E 172° E

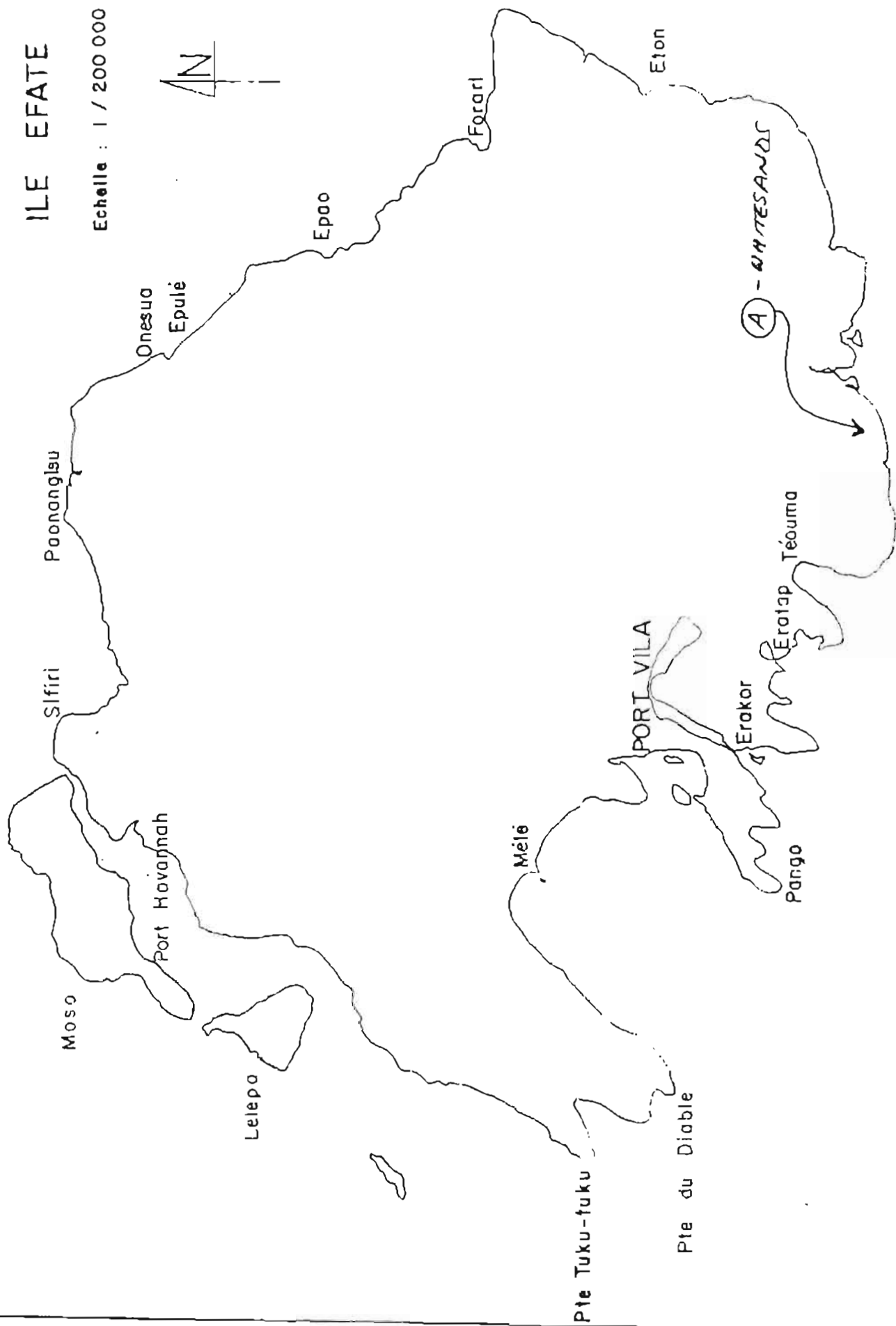
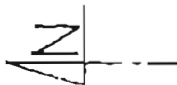
Echelle 1/4000000

Matthew, Hunter

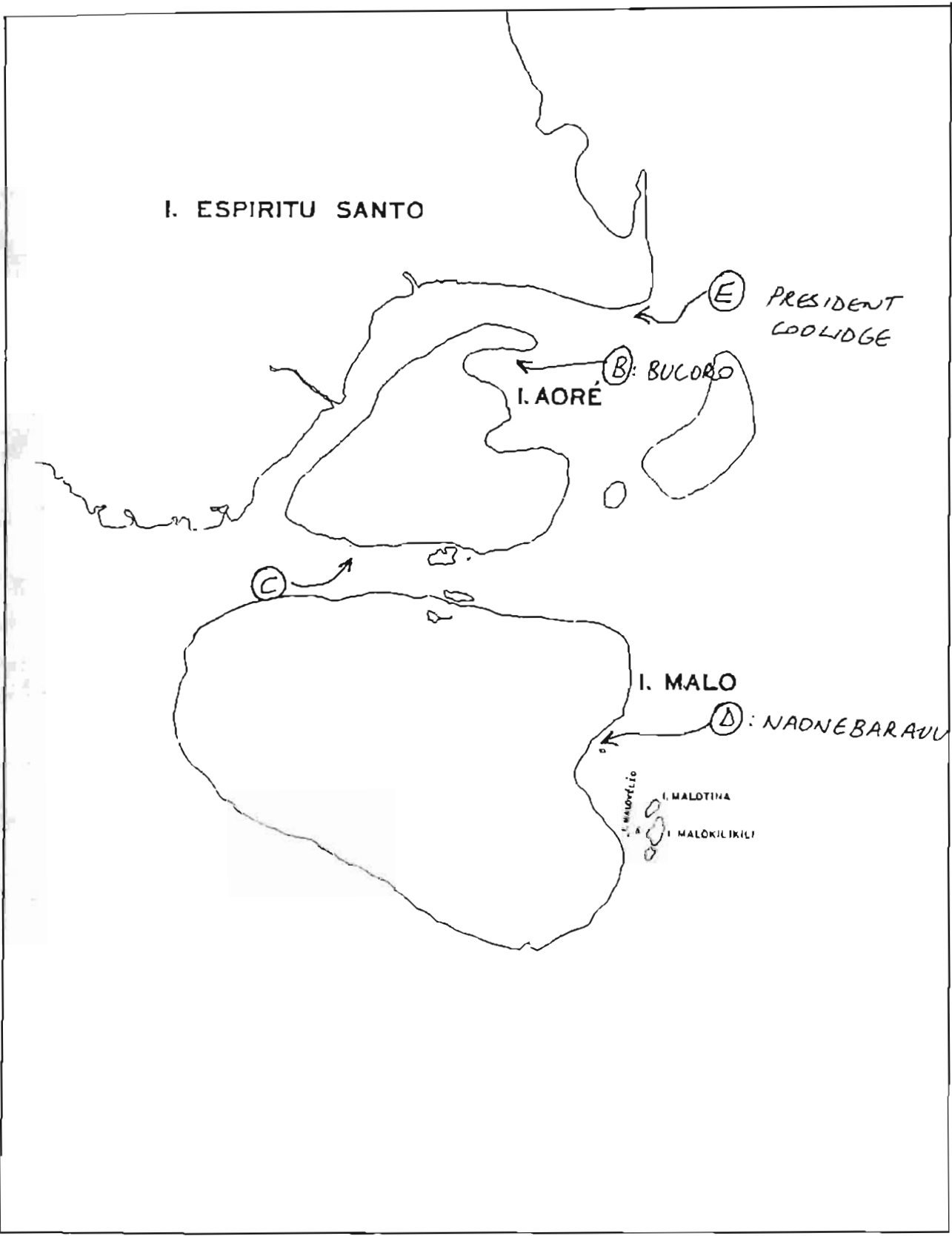


ILE EFATE

Echelle : 1 / 200 000



MAP 3.



WALLIS AND FUTUNA

GENERAL REPORT

The Territory of Wallis and Futuna consists of three islands - Wallis, Futuna and Alofi - having a total land area of about 160 km².

Its population was slightly over 12,600 at the last census taken in February 1983. This figure, however, only takes into account people actually living in the Territory, and there are as many people again residing outside it, mainly in New Caledonia, Vanuatu and France.

The Territory has several protected areas:

1. A forest area of about 30 hectares around the large volcanic lake Lalolalo on the western side of Wallis Island. This is the Vao-Tapu (i.e. sacred or forbidden forest).

For very many years this area remained untouched and no felling or clearing was ever done. The forest was always regarded as important for ensuring the regular rainfall necessary for growth of crops and maintenance of luxuriant natural vegetation, and to feed the groundwater table from which the population draws its drinking water. For as long as anyone can remember, in fact from the ancient times of our ancestors, it has always been strictly forbidden to grow crops in this area or to even enter it surreptitiously.

Special measures have been taken to protect it against bush fires, and hunting for pigeons or flying-fox is also restricted.

It must be noted that this "legislation" is not written down anywhere. Restrictions and regulations are decreed orally by the King and the Council of Ministers and relayed by word of mouth by the district or village chiefs to their subjects. Nowadays the radio is also used to broadcast such instructions.

It is however regrettable that in 1980 certain individuals flaunted this legislation and took it upon themselves to clear part of this reserve. At present, order has been restored and tighter control is being exercised.

2. The second protected area is the central plateau (Toafa, i.e. the desert), also on Wallis Island.

Geologically it is made up of poor lands and was for a long time classified as a secondary zone, unsuitable for crops. The vegetation in this area, which extends over more than 75 hectares, consists mainly of ferns and pandanus.

Since the 1960's, attempts have been made to develop this area by planting it with Caribbean pine and other imported trees. At the proper age for felling, these trees could yield excellent joinery or building timber.

A set of regulations was drawn up by the customary and administrative authorities, prohibiting the establishment of new crops in the area and the building of houses. Felling of existing trees is authorised only at the end of a prescribed period.

To guard against bush fires, eight to ten metre wide strips, called fire-breaks, have been cut through the plantations in a regular square pattern. Their maintenance is carried out by the Forestry Section of the Territorial Rural Economy Department.

3. On Futuna Island, the mountains and mountain slopes are also protected areas.

In addition to clearing being prohibited, reforestation is being carried out with pines, tamanou (*Calophyllum inophyllum*) and other local species. The recent practice of planting fodder crops is giving promising signs of rapidly enriching the soils in this area and improving their capacity to withstand erosion and the action of run-off water.

4. Lastly, the coastline is among the protected land areas.

The populated portion of both Wallis and Futuna Islands is the coastline. Sandy in parts, with black but very soft earth nearly everywhere, the coastal belt is practically at sea level. As the barrier reef is quite a long way out (3 - 4 km in places), the coast is very much exposed to the onslaught of the waves which can be very strong, particularly in stormy weather. In some places the sea can be seen to have encroached 40 or even 50 metres on the firm land.

Coastal protection programmes, launched by the public and customary authorities, are at present being implemented. They involve filling in the most exposed areas with stones and earth, an arduous task requiring tons and tons of stones and hundreds of cubic metres of earth. The purchase of heavy machinery proved absolutely necessary for the transport and handling of these very heavy materials.

5. The groundwater table from which the Wallis Islanders derive their drinking water supply is also a protected area.

The authorities are trying to find a way to preserve this groundwater from pollution by waste materials, pesticides, fertilisers and chemical products (chlorinated water, detergents, soap, etc), dumped out-of-date pharmaceutical products, etc. Everyone is well aware that the groundwater is at constant risk of being polluted from these surface sources through run-off and infiltration.

The possibility of getting rid of potential pollutants by burning them in fuel or boiler-type incinerators is being investigated.

The foregoing describes specific protected areas and the various measures taken to ensure their protection and conservation.

From a broader perspective, it is pointed out that the inhabitants of Wallis and Futuna regard the whole of their 160 km² of land area, that is to say the total area of their three islands, as an area to be protected and are very aware of the impact population pressures can and do have on this limited resource.

In 1983 there were 12,600 inhabitants on 160 km² or 25,200 if those living abroad were to return home. By the year 2,000 these numbers will in normal circumstances have grown and the question which must be answered is how will the people of Wallis and Futuna survive on their limited area of land? This illustrates why Wallis and Futuna with its 160 km², is an area that must be protected. To the people of Wallis and Futuna the protected area concept is synonymous with having enough space to live.

This is one of the reasons why the customary leaders, who have authority in matters of land tenure, are at present urging everyone to think twice before selling part of the land he owns to a foreign buyer, since the land is already proving inadequate to the needs of the indigenous population.

It is therefore with much regret that the people of Wallis and Futuna have had to curtail their traditional Polynesian hospitality which requires that anybody landing on their shores be regarded and treated as one of them.

Finally the 200 mile exclusive economic zone can be regarded as a protected area.

Current legislation provides that with regard to neighbouring countries, Wallis and Futuna has an economic zone that can be managed and exploited as considered appropriate by the Government.

Because of a lack of equipment and facilities, agreements have been entered into with Japan and Korea for the exploitation of this zone for clearly defined periods. These two countries thus have permission to fish within waters of the Territory. France assists with monitoring the EEZ area regularly with ships or aircraft which is necessary because there is illegal fishing being carried out without agreements.

These countries are intruding into a protected and prohibited area, are breaking the law, and in doing so are undermining the rights of a small and defenceless people. Clearly, unless they are prepared to enter into agreements to fish the EEZ they should cease their illegal activities.

WESTERN SAMOA

PART I - GENERAL REPORT

INTRODUCTION

Although Western Samoa established its first two national reserves in 1958, a system of national parks and reserves was first proposed following a 1974 International Union for Conservation of Nature and Natural Resources and United Nations Advisory Team joint study.

The philosophy, organisation and regulatory provisions of the current system were established by enactment of the National Park and Reserves Act 1974. Other legislation preceded and followed passage of this Act, giving Western Samoa a solid core of environmental law.

The park and reserves system's growth years were 1978-79 when one national park and three reserves were established. The availability of outside financial and management assistance enabled major development of the areas to occur in 1979-81.

Western Samoa's current park and reserve system consists of one national park and five reserves, administered by the Department of Agriculture, Forests and Fisheries.

Western Samoa has reason to be proud of its park and reserves system, yet must not rest on past laurels if the interests of future generations are to be served. Established areas must be protected by firm enforcement of existing regulations. Carefully thought out management/development plans must be devised and implemented for all areas, grass roots support for the system must be gained through a nationwide environmental education programme, research must be encouraged on system lands, and proper staffing, training, and funding levels must be assured. Solutions to current land acquisition problems must be found to ensure worthy areas are added to the system before the resources which give them national significance deteriorate.

The challenges are many, but if desire and dedication persists, the Western Samoa park and reserves system will continue to grow, mature and ultimately realise its full potential.

POPULATION

Western Samoa consists of two main and seven smaller islands (see Maps 1 and 2). Two of the latter are inhabited. Total land area is 2,800 square kilometres, of which Savaii has 1,700, and Upolu 1,100 square kilometres. Total estimated 1985 population is 160,000, of which 27 percent live on Savaii, 22 percent in the Apia urban area, and 51 percent in other parts of Upolu. There are 362 villages with an average population of 200-500 people. The last census was taken in 1981.

ESTABLISHMENT OF THE PARK AND RESERVE SYSTEM

The birth of Western Samoa's park system occurred in 1958 when the Stevenson Memorial and Mt Vaea Scenic Reserves were set aside a few miles south of Apia on the slopes of Mt Vaea. Establishment of the two reserves commemorated the author Robert Louis Stevenson, who spent the last five years of his life in Western Samoa.

The Western Samoa parks movement slumbered until early 1974 when the International Union for Conservation of Nature and Natural Resources (IUCN) was requested to assist with the selection of lands suitable for reserves and national parks, including sanctuaries. Shortly thereafter, the United Nations Advisory Team (UNDAT) funded a study team of IUCN and UNDAT representatives to draft a master plan for national parks, as well as general conservation policy for Western Samoa. The team was guided by the government of Western Samoa's underlying concern that "while development to satisfy material needs and aspirations of the Samoan people must proceed, it should not be permitted to impair their natural and cultural heritage." Three and one-half weeks of field work in October, 1974 culminated in a January, 1975 report listing ten recommendations relating to a national park system, plus 14 recommendations relating to other Western Samoa conservation issues. The UNDAT report laid the foundation for Western Samoa's current national park and reserves system. the report:

1. Defined the types of parks and reserves appropriate to Samoa's resource and cultural base.
2. Listed and described 59 areas suitable for inclusion in a park and reserves system including:
 - a) 6 national parks
 - b) 24 nature reserves
 - c) 11 historical/legendary sites
 - d) 7 archaeological sites
 - e) 5 wildlife (coral) sanctuaries
 - f) 6 recreation (beach) areas
3. Proposed the administrative structure, and management procedures necessary to establish and maintain the system.
4. Discussed legislative requirements.

The government of Western Samoa provided the cornerstone for the national parks and reserves system before UNDAT's report was released. On December 30, 1974, "an act to provide for the establishment, preservation, and administration of national parks and reserves for the benefit of the people of Western Samoa" (National Parks and Reserves Act 1974, hereafter called "the Act") was passed by Parliament. Initially "the Act" was administered by the Department of Lands and Survey, but in 1977 administrative jurisdiction was transferred to the Forestry Division in the Department of Agriculture, Forests and Fisheries. A reorganisation of the Forestry Division followed, with management responsibility for parks and reserves temporarily assigned to the Forest Extension Officer.

"The Act" separated areas proposed for inclusion in the system into two main categories:

1. National Parks
2. Reserves

NATIONAL PARK DESIGNATION AND PHILOSOPHY

National parks are public lands (not set aside for any other public purpose) of 600 hectares or larger, or islands. National parks are established by the Head of State acting on advice of Cabinet, however, an establishment order may be revoked by an act of Parliament. National parks are to be "preserved in perpetuity for the benefit and enjoyment of the people of Western Samoa". "The Act" established national park philosophy by stating:

1. Parks are to be preserved as far as practical in their natural state, including their flora, fauna, soil, water and forest resources.
2. Subject to the paramount concern of preserving a park's inherent features, the public is guaranteed freedom of entry and access so they might benefit from the inspirational, aesthetic and recreational qualities of a park.

RESERVE DESIGNATION AND PHILOSOPHY

Reserves are the second major protected area category defined in "the Act". The mechanics for establishing reserves are the same as for parks, an order from the Head of State acting on the advice of Cabinet, however, there are two differences applicable to reserves.

1. Parliament does not have veto power over areas designated as reserves.
2. Reserves may include areas of territorial sea, however, customary fishing rights are guaranteed.

"The Act" further categorised reserves into four types:

1. Nature reserves which protect, conserve and manage flora, fauna or aquatic life.
2. Recreation reserves, which although not specifically defined, pertain to natural or wild areas such as swimming areas, rather than developed playgrounds and sports fields.
3. Historic reserves which are areas of national, historic, legendary or archaeological significance.
4. Other reserves which as the name implies, are everything which do not fit into "nature, recreation or historic" categories. An example might be an area of underwater shipwrecks.

Under authority of "the Act", the Minister of Agriculture is charged with protecting reserves by:

1. Prohibiting hunting, as well as removal, altering or disturbing of the flora and fauna of reserves.
2. Restricting the activities and persons or classes of persons who may enter reserves.

GOVERNMENTAL AUTHORITY OVER PARKS AND RESERVES

In addition to the basic charge of preserving and protecting park and reserve resources, the Minister is specifically authorised to:

1. Build, alter or close any roads, tracks or bridges.
2. Designate campgrounds, picnic grounds and parking areas.
3. Construct buildings with materials supplied either on or off premises.
4. Provide regulatory and informational signing.
5. Promote or supervise excavations for the purpose of discovering and preserving relics of national importance.

6. Designate hours of public use.
7. Do anything else necessary to ensure proper control, administration, maintenance or improvement of areas (including temporary closure).

Regulatory authority reserved for the Head of State and the Cabinet include the right to:

1. Impose admission fees (currently there are none at any of the areas).
2. Provide special protection for any park or reserve, or any natural resource found therein.
3. Appoint rangers, specifying their authority and responsibilities.
4. Provide any regulations necessary to implement the intent of "the Act."
5. Define offences of "the Act".

Defined offences include:

1. Allowing a domestic animal to enter a reserve or park.
2. Removing, altering or disturbing any natural feature, flora or constructed item.
3. Littering or depositing any dangerous or offensive substance.
4. Violating any other published regulation.

Conviction on any offence carries a maximum punishment of three months imprisonment, a \$500 fine, or both.

ENVIRONMENTAL LEGISLATION

In addition to the National Park and Reserves Act 1974 Western Samoa's environment legislation includes:

1. Water Supply Ordinance 1953 which addresses water wasting, pollution, and the causing of damage to water supplies.
2. Land for Water Supply Ordinance 1955 which provides for the acquisition of water catchment areas.
3. Health Ordinance 1959 which consolidates health laws and custodial environmental regulations pertaining to public health.
4. Land Ordinance 1959 which establishes the Department of Lands and Survey, and defines provisions relating to government lands.
5. Agriculture, Forests and Fisheries Ordinance 1959 which establishes the Department of Agriculture, Forests and Fisheries.
6. Water Act 1965 which consolidates laws relating to water conservation supply and use, and prohibits removal of protective vegetation within 60 metres of rivers.
7. Forests Act 1967 which provides for the conservation, protection and development of forest, soil, water, historic and archaeological sites, and permits government to designate areas as "protected land", prohibiting owners from clearing and cultivating areas, or cutting trees except for personal use.
8. Fish Protection Act 1972 which establishes controls on foreign fishermen fishing Western Samoa territorial waters.
9. Fish Dynamiting Act 1972 which prohibits dynamiting fish and the selling or possession of dynamiting fish.
10. Animals (Protection of Wild Birds) Regulation 1981 which gives complete protection to 15 birds, and seasonal protection to three.

11. Arbor Day, the first Friday in November, was proclaimed a public holiday in 1978. The Monday-Thursday preceding Arbor Day is now designated as Conservation Week. Numerous activities take place all week around a conservation theme.
12. Western Samoa was a signatory to the "Convention for the Conservation of Nature in the South Pacific 1976."
13. There is also a considerable amount of regulative, cultural, traditional and oral law containing environmentally related provisions pertaining to life in Samoa.

PARK AND RESERVE ADMINISTRATION

In late 1978 UNDAT was retained by Western Samoa to do a follow-up to their January, 1975 report. A three man team comprising a botanist, geologist and zoologist provided management, development and interpretative data for O Le Pupu Pu'e National Park. Management and interpretative recommendations were also provided for three existing and three proposed reserves.

In 1979-80 the World Wildlife Fund, the Government of New Zealand, and IUCN jointly funded a New Zealand park advisor to serve as Western Samoa's first National Parks and Reserves Superintendent, and advisor to the national parks project. A Samoan counterpart received on-the-job training during this period to enable him to eventually assume the Superintendent's role. Additional overseas training was provided in New Zealand for him and two assistants.

A management plan for O Le Pupu Pu'e National Park was completed in 1981. Much of the existing development of the park and reserves system occurred during this time.

Management jurisdiction for the park and reserves system currently lies with the Department of Agriculture, Forests and Fisheries, under the direction of a National Park and Reserves Officer. Two trainees provide assistance to the officer, directing daily activities in the Apia and Togitogiga Districts (Figure 1).

ESTABLISHED NATIONAL PARK AND RESERVES

Western Samoa's National Park and Reserves system currently consists of one national park and five reserves. Two of the reserves were established prior to passage of the National Park and Reserves Act 1974.

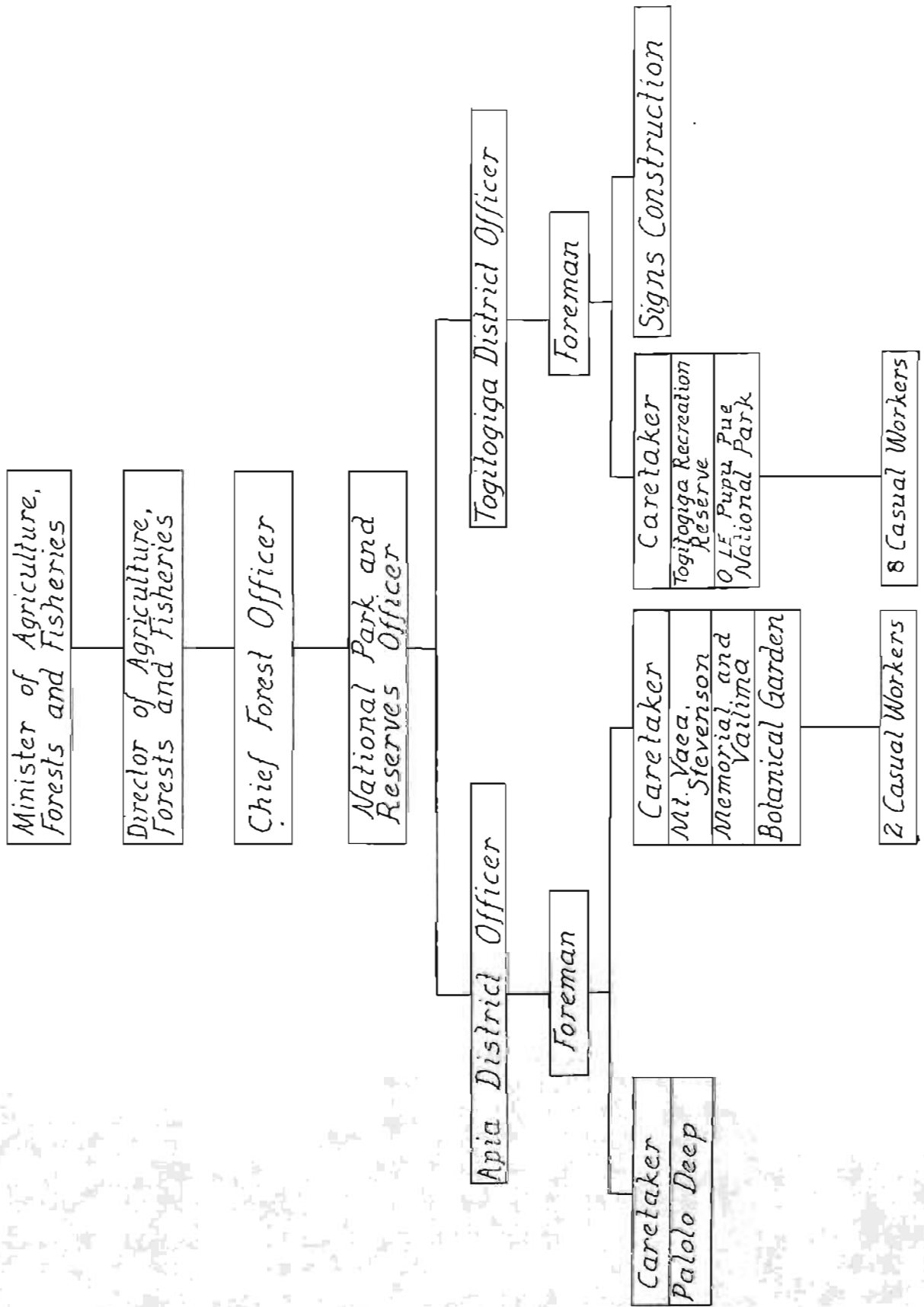
Stevenson Memorial Reserve was established in 1958 to honour the author Robert Louis Stevenson who resided in Western Samoa for five years prior to his death in 1894. The half hectare reserve, near the crest of Mt Vaea, contains the author's tomb, a small shelter and toilets. Access to the reserve is via either of two tracks through Mt Vaea Scenic Reserve.

Mt Vaea Scenic Reserve, also established in 1958, blankets 51 hectares of the eastern slope of 470 metres high Mt Vaea. The Reserve supports second growth foothill forest, however, much of the lower slopes have been replanted with exotic species following severe storm damage in 1963. Vailima Stream flows through the Reserve cascading over two waterfalls, one with an established swimming pool at its base.

Vailima Botanical Garden is a 12 hectare area sandwiched between Mt Vaea Scenic Reserve and the Head of State's residence (former Robert Louis Stevenson's home). Established in 1978, the garden exhibits native and exotic species, including a plot of common food crops.

Figure 1

WESTERN SAMOA PARK AND RESERVES SECTION ORGANIZATION CHART



Togitogiga Recreation Reserve has as its main attractions two waterfalls of the Mataloa River. A small swimming hole below the lower falls is used extensively by swimmers. Picnic, change house and toilet facilities complement the area. The 2½ hectare reserve lies adjacent to O Le Pupu Pu'e National Park and was established in 1978.

Palolo Deep Marine Reserve encompasses a deep hole in the reef flat hosting a good display of coral and small fish. A pier and shelter located midway between shore and the reef provides a convenient access point to the "deep" for snorklers. The 22 hectare area was established in 1979.

PROPOSED PROTECTED AREAS

See Tables 4 - 8 and Appendix 1.

PROBLEMS, NEEDS AND PROSPECTS

Considerable progress has been made since the national park and reserve system was founded in 1974. In any new venture frustrations and setbacks often occur posing new challenges. Some of the issues which must be addressed if Western Samoa's park and reserve system is to grow and mature are the following:

1. The last addition to the system was Palolo Deep Marine Reserve in December, 1979. Over 80% of the land proposed for parks and reserves is on private or customary land (Tables 1 and 2). Although it was proposed to amend the National Park and Reserves Act 1974 to allow establishment of parks and reserves on non-public land, to date this has not been done. As land near villages becomes depleted, population grows, or new access is provided, wildland more vulnerable to environmental damage due to steep slope, exposure, etc, is being cleared for agriculture, housing, and other uses. Unless something is done soon to resolve the land acquisition problem associated with private and customary land, much of the land proposed for the system will be so markedly altered as to negate its value for park and reserve status.

Due to high cost, the likelihood of outright purchase of private and customary land is slim, rather some innovative means of acquiring those landrights which will protect the resources worthy of national park and reserve status, and simultaneously guarantee public access, must be found.

Table 1

Distribution of Lands (in sq. miles)
(in between brackets percentages)

	Savaii	Upolu	Total
Customary Land	594.5 (89.8)	286.9 (66.2)	881.4 (80.5)
Private Freehold Land	6.2 (0.9)	34.0 (7.8)	40.2 (3.7)
WSTFC	3.2 (0.5)	46.6 (10.8)	49.8 (4.5)
Public (Government) Land	57.9 (8.7)	65.8 (15.2)	123.7 (11.3)
Total	661.8 (100.0)	433.3 (100.0)	1,095.1 (100.0)

Table 2

Approximate Areas of Land by Land Categories
Required to Establish the Proposed Parks
System in Western Samoa

Land Category	Thousands of Acres	Percentage of Total
Customary Land	35.1	75.5%
Private Freehold Land	1.5	3.2%
WSTEC	0.8	1.8%
Public (Government) Land	9.1	19.5%
Total	46.5	100.0%

Source: UNDAT (1975): 28, A National Parks System for Western Samoa

2. Island ecosystems are extremely vulnerable due to their small land masses, limited flora and fauna populations, and lack of species diversity. It is imperative that all Western Samoa's ecosystems are studied and understood so appropriate management techniques can be applied to maintain or restore healthy conditions on system lands. The government of Western Samoa must encourage research and benchmark ecological surveys on all system lands by qualified people educated in the sciences.
3. A national park and reserve system will only be successful if Samoans are aware of it and support it. A national pride must be developed for the system similar to that which **exists** for international Samoan athletes. Pride can best be developed **through** education, be it in the schools, through mass media, or **special events**, such as conservation week. A national wildlife symbol **similar** to America's "Woodsey the Owl", or New Zealand's "Kiwi", could be the focal point for establishing a national conservation ethic.
4. Regulatory provisions of the National Park and Reserves Act 1974 must be enforced rigidly throughout the system. Park and reserve boundaries must be clearly marked and monitored regularly for encroachment. Violators must be dealt with decisively to deter others from committing similar offences. Effective enforcement will require law enforcement training for selected park and reserve personnel.
5. Proper management is greatly dependent upon the availability of adequate funds to apply that management. National park and reserves funding has actually decreased in recent years (Table 3), at the same time the purchasing power of the Samoan Tala has diminished. Resolution of this problem is difficult in a country which depends upon outside aid for 78% of its operating budget. A scarcity of outside funds due to a depressed world economy, coupled with the Government of Western Samoa's emphasis upon projects which promote economic self reliance, makes it difficult to compete with large development projects which have greater or quicker projected paybacks than investments in parks and reserves. Only when government accepts the premise that reserving wildland intact is a valid land use, an investment in the future, will parks and reserves be able to compete equally with other land use and development projects.

Table 3

Western Samoa Park and Reserve Staffing and Funding

Year	Total Staff	Operating Budget (W.S. Tala)
1979	26	\$66,300
1980	28	\$45,500
1981	30	\$42,350
1982	20	\$36,900
1983	19	\$38,741
1984	15	\$21,713
1985	15	\$25,390

Source: Department of Agriculture, Forests and Fisheries Budget Documents.

6. Management plans need to be prepared for those areas which do not have them, and updated for those that do. Development must not be allowed to occur piecemeal without careful consideration of how individual proposals fit the overall management and development picture. Environmental consequences must be a paramount consideration in all development proposals. An acceptable balance between use, yet retention of resource values, must be strived for. Will proposal benefits outweigh environmental consequences? Is the proposal in the best interest of future generations? Tough questions such as these must be asked and answered before development is initiated and irreversible environmental consequences occur.
7. Park and reserve personnel must receive training to keep them abreast of new management policies and procedures. South Pacific countries are unique in many ways. Management systems and techniques which work in developed countries may be inappropriate for Western Samoa. Training must be geared to Western Samoa's conditions and needs.

SUMMARY

Although Western Samoa established its first two reserves in 1958, a system of national parks and reserves was first proposed following a 1974 IUCN/UNDAT study.

The philosophy, organisation and regulatory provisions of the current system were established via passage of the National Park and Reserves Act 1974. Other legislation preceded and followed "The Act", giving Western Samoa a solid core of environmental law.

The system's growth years were 1978-79, when one national park and three reserves were established. The availability of outside financial and management assistance enabled major development of the areas to occur in 1979-81.

Western Samoa's current park and reserve system consists of one national park and five reserves, administered by the Department of Agriculture, Forests and Fisheries.

Western Samoa has reason to be proud of its park and reserves system, yet must not rest upon past laurels if the interests of future generations are to be served. Established areas must be protected by firm enforcement of existing regulations. Carefully thought out management/development plans must be devised and implemented for all areas, grass roots support for the system must be gained through a nationwide environmental education

programme, research must be encouraged on system lands, and proper staffing, training and funding levels must be assured. Solutions to current land acquisition problems must be found to ensure worthy areas are added to the system before the resources which give them national significance deteriorate.

The challenges are many, but if desire and dedication persists, the Western Samoa park and reserve system will continue to grow, mature and ultimately realise its full potential.

PART II: INFORMATION SHEETS ON PROTECTED AREAS

PROTECTED AREA NAME Palolo Deep Marine Reserve

MANAGEMENT CATEGORY Protected Landscape

LEGAL PROTECTION 100% - completely protected.

DATE ESTABLISHED December, 1979.

GEOGRAPHICAL LOCATION

Western Samoa-Upolu Island-Tuamasaga District-Vaimauga West Subdistrict 13° 49' South 171° 45' West. One mile from centre of Apia, Western Samoa.

ALTITUDE 0-1 metre above sea level.

AREA 22 hectares

LAND TENURE Public

PHYSICAL FEATURES

Palolo Deep has a small sand beach extending onto the reef flats. Small basalt rocks sprinkle the reef flat to the deep, a 10 metre hole about 200 metres in diameter in the reef flat. The origin of the deep is uncertain. One hypothesis is that a freshwater spring prevented coral growth in the area. The ocean side of the deep consists of a talus slope of sand and coral debris thrown over the reef.

Ocean temperatures range from 24-30°C. The mean daily temperature is 27°C, with a range between 22-30°C. The average annual rainfall is 287 centimetres, of which 190 centimetres falls October-March.

VEGETATION

The 10 metre wide access strip has a banana tree overstory with various ornamental shrubs as an understory. A huge Pulu tree is located near the reserve entrance.

NOTEWORTHY FAUNA

Palolo Deep contains many corals and a good variety of small fish and ocean creatures such as sea urchins, sea cucumbers, starfish, lionfish and possibly stonefish.

CULTURAL HERITAGE

Nothing of significance.

LOCAL POPULATION

Palolo Deep is situated within the City of Apia, a collection of about 60 villages with a total population of 35,000.

CONSERVATION MANAGEMENT

No management plan exists, but one will be completed in 1985.

ZONING None.

DISTURBANCES AND DEFICIENCIES Fishing and coral gathering are problems.

SCIENTIFIC RESEARCH

No research conducted other than some occasional water sampling.

SPECIAL SCIENTIFIC FACILITIES None.

PRINCIPAL REFERENCE MATERIAL

- a) UNDAT Report (1975): *A National Parks System for Western Samoa.*
- b) UNDAT Report (1979): *O le Pupu Pu'e National Park, Volume 2*
- c) Western Samoa National Parks and Reserves Section (1981): *Palolo Deep Marine Reserve*

STAFF: One caretaker, who works seven days/week.

BUDGET

No individual budget, included in total National Park and Reserves budget.

LOCATION ADMINISTRATION

Department of Agriculture, Forests and Fisheries
National Park and Reserves
P.O. Box 206,
Apia, Western Samoa

<u>PROTECTED AREA NAME</u>	Mt Vaea Scenic Reserve
<u>MANAGEMENT CATEGORY</u>	Protected Landscape
<u>LEGAL PROTECTION</u>	100% - completely protected
<u>DATE ESTABLISHED</u>	September 22, 1958

GEOGRAPHICAL LOCATION

Western Samoa-Upolu Island-Taumasaga District-Vaimauga West Subdistrict 13° 51' South 171° 46' West. Three miles south of the centre of Apia, adjacent to Stevenson Memorial Reserve and Vailima Botanical Garden.

ALTITUDE 180 - 400 metres above sea level.

AREA

Mt Vaea Scenic Reserve is 51 hectares, and is adjacent to ½ hectare Stevenson Memorial Reserve, and 12 hectare Vailima Botanical Garden.

LAND TENURE Public

PHYSICAL FEATURES

Mt Vaea is a small remnant of an old volcano sticking up through younger volcanoes. The Reserve consists entirely of the oldest rock found in Western Samoa - Fagaloa volcanics. The Reserve has dense lava flows plus lava flows which contain a large amount of gases and hence are loose and soft (rubbly lava). The latter eroded rather easily, forming the two waterfalls on Vailima Stream.

The mean daily temperature is 27°C, with a range between 22-30°C. The average annual rainfall is 287 centimetres, of which 190 centimetres falls October-March.

VEGETATION

There are three general categories of vegetation found in the reserve:

1. Plantation forest resulting from man's intervention in the natural environment, primarily after severe storm damage in 1963. Predominant species include *Cedrella odorata*, *Albizia chinensis*, *Albizia falcata*, *Castilloa elastica*, *Puntumia elastica*, *Pinus sp.*, *Eucalyptus sp.*, and *Securinega flexuosa*.
2. Secondary forest dominated by mature species adapted to germination and growth in sunny disturbed areas. Early stages of secondary forests host *Pipturus argenteus*, *Kleinhovia hospital*, *Homalanthus nutans*, and *Hibiscus tiliaceus*. Later stages of secondary forest host *Rhus taitensis*, *Alphitonia zizyphoides*, *Bischofia javanica*, *Macaranga stipulosa*, *Cananga odorata*, *Myristica fatua*, and tree ferns of the genus *Cyathea*.
3. Foothill rain forest is found as small patches of native species within secondary forest. No one species is dominant, however *Myristica*, *Palaquium stehlinii*, *Syzygium ionophylloides*, *Canarium samoense*, *Barringtonia samoensis*, and *Pometia pinnata* are all represented.

NOTEWORTHY FAUNA

Twenty species of birds inhabit the Reserve. The most dominant are the Wattled Honey-Eater, Samoan Starling, White-Rumped Swiftlet, Polynesian Triller, Samoan Fantail, and Red-Vented Bulbul.

The Flying Fox is the only known mammal which inhabits the Reserve. Three reptile species reside in the Reserve - the Black Skink, Samoan Skink and Polynesian Gecko.

CULTURAL HERITAGE

Nothing of significance.

LOCAL POPULATION

The reserve is located just west of a string of small Samoan villages fronting on Tiavi Road (East Cross Island Road). Interspersed are a few small plantations which provide food for villagers. The Head of State's residence is immediately south of the reserve entrance road (Track of Loving Hearts).

CONSERVATION MANAGEMENT

No management plan exists, but one will be completed in 1985.

ZONING

None

DISTURBANCES AND DEFICIENCIES

Firewood gathering, agricultural encroachment.

SCIENTIFIC RESEARCH

Geology, flora and fauna survey work done by 1979 UNDAT.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- a) UNDAT Report (1975): *A National Parks System for Western Samoa.*
- b) Western Samoa Department of Lands and Survey (1976): *Mt Vaea - a Project for the Establishment of a Nature Reserve in Western Samoa.*
- c) UNDAT Report (1979): *O Le Pupu Pu'e National Park, Volume 2.*
- d) Western Samoa National Parks and Reserves Section (1981): *Mt Vaea*

STAFF

Scenic Reserve, Vailima Botanical Garden, Stevenson Memorial Reserve.

A caretaker, who works seven days/week, is assisted by two casual workers who each work five days/week. These three men are responsible for maintenance of Mt Vaea, and Stevenson Memorial Reserves, plus Vailima Botanical Garden.

BUDGET

No individual budget, included in total National Park and Reserves budget.

LOCAL ADMINISTRATION

Department of Agriculture, Forests and Fisheries
National Park and Reserves
P.O. Box 206
Apia, Western Samoa.

PROTECTED AREA NAME Stevenson Memorial Reserve

MANAGEMENT CATEGORY Protected Landscape

LEGAL PROTECTION 100% - completely protected.

DATE ESTABLISHED September 22, 1958.

GEOGRAPHICAL LOCATION

Western Samoa-Upolu Island-Taumasaga District-Vaimauga West Subdistrict 13° 51' South 171° 46' West. Three miles south of the centre of Apia, adjacent to Mt Vaea Scenic Reserve and Vailima Botanical Garden.

ALTITUDE 400 metres above sea level.

AREA

Stevenson Memorial Reserve is $\frac{1}{2}$ hectare, and is adjacent to 51 hectare Mt Vaea Scenic Reserve, and 12 hectare Vailima Botanical Garden.

LAND TENURE Public

PHYSICAL FEATURES

Stevenson Memorial Reserve is a small three-level terraced area, just below the summit of Mt Vaea, a small remnant of an old volcano sticking up through younger volcanoes.

The mean daily temperature is 27°C, with a range between 22-30°C. The average annual rainfall is 287 centimetres, of which 190 centimetres falls October-March.

VEGETATION

Reserve vegetation consists of Lopa, Gatae, Asi and breadfruit.

NOTEWORTHY GAUNA

The Reserve is small, limiting the number of permanent inhabitants. The Black Skink, Samoan Skink and Polynesian Gecko may inhabit the Reserve at certain times of the year.

CULTURAL HERITAGE

The tomb of Robert Louis Stevenson, the renown author, is the central attraction of the Reserve.

LOCAL POPULATION

The reserve is located just west of a string of small Samoan villages fronting on Tiavi Road (East Cross Island Road). Interspersed are a few small plantations which provide food for villagers. The Head of State's residence is immediately south of the reserve entrance road (Track of Loving Hearts).

CONSERVATION MANAGEMENT

No management plan exists, but one will be completed in 1985.

ZONING None.

DISTURBANCES AND DEFICIENCIES None.

SCIENTIFIC RESEARCH No research conducted.

SPECIAL SCIENTIFIC FACILITIES None.

PRINCIPAL REFERENCE MATERIAL

- a) UNDAT Report (1979): *O Le Pipu Pu'e National Park*, Volume 2.
- b) Western Samoa National Parks and Reserves Section (1981): *Mt Vaea Scenic Reserve, Vailima Botanical Garden, Stevenson Memorial Reserve*.

STAFF

A caretaker, who works seven days/week, is assisted by two casual workers who each work five days/week. These three men are responsible for the maintenance of Mt Vaea, and Stevenson Memorial Reserves, plus Vailima Botanical Garden.

BUDGET

No individual budget, included in total National Park and Reserves budget.

LOCAL ADMINISTRATION

Department of Agriculture, Forests and Fisheries
National Park and Reserves
P.O. Box 206,
Apia, Western Samoa

PROTECTED AREA NAME Vailima Botanical Garden

MANAGEMENT CATEGORY Managed Nature Reserve

LEGAL PROTECTION 100% - Completely protected

DATE ESTABLISHED October 11, 1978

GEOGRAPHICAL LOCATION

Western Samoa-Upolu Island-Taumasaga District-Vaimauga West Subdistrict 13° 51' South 171° 46' West. Three miles south of the centre of Apia, adjacent to Stevenson Memorial and Mt. Vaea Scenic Reserves.

ALTITUDE 180 metres above sea level.

AREA

Vailima Botanical Garden is 12 hectares and is adjacent to ½ hectare Stevenson Memorial, and 41 hectares Mt Vaea Scenic Reserve.

LAND TENURE Public.

PHYSICAL FEATURES

Vailima Botanical Garden is a gentle north sloping area immediately south of Vailima Stream, and Mt Vaea Scenic Reserve.

The Reserve has shallow soil, underlain by the oldest rock found in Western Samoa - Fagaloa Volcanics.

The mean daily temperature is 27°C, with a range between 22-30°C. The average annual rainfall is 287 centimetres, of which 190 centimetres falls October-March.

VEGETATION

Many species of trees, ornamental shrubs, and food crops (native and exotic), which grow in Western Samoa, are represented in the garden.

NOTEWORTHY FAUNA

Although there has been no survey of the Reserve, it is thought many of the birds which are found in Mt Vaea Scenic Reserve either reside or are transients through the garden.

Three reptile species reside in the Reserve - The Black Skink, Samoan Skink and Polynesian Gecko.

CULTURAL HERITAGE Nothing of significance.

LOCAL POPULATION

The reserve is located just west of a string of small Samoan villages fronting on Tiavi Road (East Cross Island Road). Interspersed are a few small plantations which provide food for villagers. The Head of State's residence is immediately south of the reserve entrance road (Track of Loving Hearts).

CONSERVATION MANAGEMENT

No management plan exists, but one will be completed in 1985.

ZONING None

DISTURBANCES AND DEFICIENCIES

Vandalism and pilfering of plant labels, pilfering of plants.

SCIENTIFIC RESEARCH

No research conducted.

SPECIAL SCIENTIFIC FACILITIES NonePRINCIPAL REFERENCE MATERIAL

- a) UNDAT Report (1979): *O Le Pupu Pu'e National Park*, Volume 2.
- b) Western Samoa National Parks and Reserve Section (1981): *Mt Vaea Scenic Reserve, Vailima Botanical Garden, Stevenson Memorial Reserve*.
- (c) *Western Samoa National Parks and Reserve Section (1985)*: An unpublished planting plan of species currently growing in the garden.

STAFF

A caretaker, who works seven days/week, is assisted by two casual workers who each work five days/week. These three men are responsible for the maintenance of Mt Vaea, and Stevenson Memorial Reserves, plus Vailima Botanical Garden.

BUDGET

No individual budget, included in total National Park and Reserves budget.

LOCAL ADMINISTRATION

Department of Agriculture, Forests and Fisheries
National Park and Reserves
P.O. Box 206
Apia, Western Samoa

PROTECTED AREA NAME Togitogiga Recreation Reserve
MANAGEMENT CATEGORY Protected Landscape
LEGAL PROTECTION 100% - completely protected
DATE ESTABLISHED 1978

GEOGRAPHICAL LOCATION

Western Samoa-Upolu Island-Atua District-Falealili Subdistrict 14° 0' South 171° 43' West. Sixteen miles south of Apia, adjacent to O Le Pupu Pu'e National Park.

ALTITUDE 30-60 metres above sea level.

AREA

Togitogiga Recreation Reserve is 2½ hectares and is adjacent to 2,800 hectare O Le Pupu Pu'e National Park.

LAND TENURE Public

PHYSICAL FEATURES

The Mataloa River flows through the reserve cascading over two waterfalls. The falls are capped with hard rock overlaying softer rock which has gradually eroded away, forming the falls. The lower falls are comprised of two lots of volcanic rocks of different ages. The lower rocks are Fagaloa volcanics (2,000,000 years old), while the waterfall caprock is of Salani volcanics (50,000 years old). The upper waterfall is formed at the junction of two small lava flows of the Salani age.

The mean daily temperature is 27°C, with a range between 22-30°C. Annual rainfall is about 300 centimetres.

VEGETATION

The reserve has an overstory of Tava, Mamala and Tamalini. Coconut fern, hibiscus and a variety of other plants compose the understory.

NOTEWORTHY FAUNA

Many of the bird species inhabiting the lower elevations of O Le Pupu Pu'e reside in or pass through Togitogiga.

The reserve also hosts the snake-eyed skink, azure-tailed skink and the Samoan Skink.

CULTURAL HERITAGE Nothing of significance.

LOCAL POPULATION

Togitogiga is located 16 miles south of Apia, the only City in Western Samoa (35,000). A string of small villages are located near the reserve along the South Coast Road.

CONSERVATION MANAGEMENT

No management plan exists, but one will be completed in 1985.

ZONING None

DISTURBANCES AND DEFICIENCIES None.

SCIENTIFIC RESEARCH Geology survey work done by 1979 UNDAT.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- a) UNDAT Report (1979): *O Le Pupu Pu'e National Park*, Volume 2.
- b) Western Samoa National Parks and Reserve Section (1981): *Western Samoa's National Parks and Reserves*.

STAFF

A caretaker, who works seven days/week, is assisted by ten other workers who work five days/week. These eleven people are responsible for the maintenance of O Le Pupu Pu'e National Park and Tongitogiga Recreation Reserve.

BUDGET

No individual budget, included in total National Park and Reserves budget.

LOCAL ADMINISTRATION

Department of Agriculture, Forests and Fisheries
National Park and Reserves
P.O. Box 206
Apia, Western Samoa

<u>PROTECTED AREA NAME</u>	O Le Pupu Pu'e National Park
<u>MANAGEMENT CATEGORY</u>	National Park
<u>LEGAL PROTECTION</u>	100% - completely protected
<u>DATE ESTABLISHED</u>	March, 1978

GEOGRAPHICAL LOCATION

Western Samoa-Upolu Island-Atua District-Falealili and Anoamaa West Sub-districts, Taumasaga District-Siumu and Vaimauga East Subdistricts. 13° 55' South to 14° 2' South 171° 42' to 45' West. Sixteen miles south of Apia, adjacent to Togitogiga Recreation Reserve.

ALTITUDE: 10-1,075 metres above sea level.

AREA

O Le Pupu Pu'e National Park is 2,800 hectares, and is adjacent to the 2½ hectares Togitogiga Recreation Reserve.

LAND TENURE Public

PHYSICAL FEATURES

O Le pupu Pu'e National Park stretches from the ironclad south coast to the main divide on the island of Upolu. The park contains the highest elevation on Upolu, 1,075 metre Mt Fito.

The highland is composed of a broad plateau punctuated by volcanic cones and craters, cut by several steep valleys. The terrain from the highland plateau slopes south 8 degrees, but is cut by rather steep valleys. The southern park terrain rises from sea level (eroded cliffs 10 metres above the sea) to a gentle plain about 300 metres above sea level.

The park dates from the Fagaloa volcanics, which erupted and probably built a large shield volcano with hundreds of lava flows. The Fagaloa volcano was deeply weathered and eroded. About 100,000 years ago more volcanic activity occurred which built up lava shields surmounted by relatively small scoria cones. The Salani volcanoes probably erupted over a long period building a broad slope slanting southward toward the ocean.

About 3,000 years ago Mt Fito erupted spouting lava which flowed down the valleys forming a wide lava fan in the southern lowlands of the park. The lava reached the ocean flowing over any lagoons and reefs which existed. Erosion has been the dominating force since the Mt Fito eruption. Temperature range is about 22-30° depending upon altitude and time of the year. Annual rainfall is about 350 centimetres at the highest elevations due to the prevailing winds off the ocean, and the rain shadow effect of the central range.

VEGETATION

O Le Pupu Pu'e has three general categories of vegetation comprising ten plant communities:

1. Littoral Vegetation
 - Lepturus* rock strand
 - Scaevola* littoral scrub
 - Pandanus* littoral forest
 - Calophyllum* littoral forest
2. Rain Forest Vegetation
 - Tava lowland forest
 - Mamalawa foothill forest
 - Mafua foothill forest
 - Maota mea montane forest

3. Crater Vegetation: Montane march
Montane swamp forest

The four littoral vegetation types include the scientific name of the dominant species. The four rain forest types include the Samoan name of the dominant tree species.

NOTEWORTHY FAUNA

Forty-two bird species are known to inhabit the park including 12 endemic to Western Samoa. The five most dominant species are the Samoan Starling, White-Rumped Swiftlet, Wattled Honey-Eater, Cardinal Honey-Eater, and Pacific Pigeon. More species of birds are found in the park than all species of mammals and reptiles combined. At least 7 bird species residing in the park are considered rare, endangered or threatened.

The park hosts five mammal species - 3 native bats (2 species of flying foxes, and sheath-tailed bat), and two introduced species (Polynesian rat and pig). Four reptile species reside in the park - the snake-eyed skink, azure-tailed skink, Samoan skink, and an unidentified skink.

CULTURAL HERITAGE Nothing of significance.

LOCAL POPULATION

O Le Pupu Pu'e is located 16 miles south of Apia, the only City in Western Samoa (35,000). A string of small villages are located near the park along the south Coast Road.

CONSERVATION MANAGEMENT

A management plan was completed in 1981, and will be updated in 1985. Most of the major recommendations in the 1981 plan have been achieved. The park has a small interpretative centre explaining flora, fauna and geology of the area. It also has information on the National Reserves.

ZONING None

DISTURBANCES AND DEFICIENCIES

Poaching, agricultural encroachment, boundary line disputes.

SCIENTIFIC RESEARCH

Geology, flora and fauna survey work done by 1979 UNDAT.

SPECIAL SCIENTIFIC FACILITIES None

PRINCIPAL REFERENCE MATERIAL

- a) UNDAT Report (1975): *A National Parks System for Western Samoa.*
- b) UNDAT Report (1979): *O Le Pupu Pu'e National Park, Volumes 1 and 2.*
- c) Mossman R. and Berg P. (1981): *O Le Pupu Pu'e National Park Management Plan.*
- d) Western Samoa National Parks and Reserve Section (1981): *Western Samoa's National Parks and Reserves.*

STAFF

A caretaker, who works seven days/week, is assisted by ten other workers who work five days/week. These eleven people are responsible for the maintenance of O Le Pupu Pu'e National Park, and Togitogiga Recreation Reserve.

BUDGET

No individual budget, included in total National Park and Reserves budget.

LOCAL ADMINISTRATION

Department of Agriculture, Forests, and Fisheries
National Park and Reserves
P.O. Box 206
Apia, Western Samoa

TABLE 4.

PROPOSED NATIONAL PARKS

NAME	APPROX. AREA (acs.)	ALTITUDE RANGE (ft. a. s. l.)	ECOSYSTEMS PROTECTED	CONSERVATION SIGNIFICANCE	RESERVATION PRIORITY
<u>UPOLU</u>					
1. Nu'utele Island Group	420	0-650	2;6;13	++	++
2. O Le Pupū	Established as Western Samoa's first national park in 1978.				
3. Lake Lanoto'o	2,600	2,000-2,900	4;5a;8	+	++
4. Lake Olomaga	3,200	700-1,800	4;6;7	++	+++
<u>SAVAI'I</u>					
5. Mount Silisili	22,000	550-6,100	7;8;9; 10;10a;10b	+++	+
6. Tafua	6,500	0-550	2;2a;6; 11;12	++	++

Notes:

- (1) + moderate ++ high +++ very high
- (2) Conservation significance= number of ecosystems within the park or reserve, their condition, and their representation within Western Samoa as a whole.
- (3) Reservation priority= The extent to which a reserve is under pressure from other forms of land use, and the ease with which it might be reserved.
- (4) Western Samoa ecosystems probably in existence before 1700: 1. Tidal forest 2. Littoral forest and scrub of coastal sands 2a. Littoral forest and scrub on spray-swept rocky coastline 3. Low-land rush and reed swamps 4. Upland rush and reed swamps 5. Lowland swamp forest 5a. Upland swamp forest 6. Primary high forest of foothills (sea level to 750 ft.) 7. Primary high forest of foothills (approx. 750-1,800 ft.) 8. Primary high forest of uplands (approx. 1,800-4,000 ft.) 9. Primary low forest of highlands (over 4,000 ft.)

TABLE 4 (continued)

NOTES:

(4- continued) Western Samoa ecosystems probably in existence since 1700: 10. Open scrub and light forest on lava fields of lowlands 10a. Open scrub and light forest on lava fields of foothills and uplands 10b. Light forest on lava fields of highlands.

For the purposes of the parks system it is necessary to add the main coastal/inshore ecosystems: 11. Iron-bound coasts without reef (formed by lava flowing to the sea and submerging former coral sands and reef) 12. Weathered iron-bound coasts with developing reef 13. Coral sands with developed reef.

Sources: Table 6 and Notes (1), (2), (3), and (4- ecosystems 11-13)= UNDAT Report (1975) 12 and 16: A National Parks System for Western Samoa

Note (4- ecosystems 1-10b)= Wright, S. G. A. (1963) 32-40: Soils and Land Use of Western Samoa

TABLE 5.

PROPOSED NATURE RESERVES

NAME	APPROX. AREA (acs.)	ALTITUDE RANGE (ft. a. s. l.)	ECOSYSTEMS PROTECTED	CONSERVATION SIGNIFICANCE	RESERVATION PRIORITY
Established as one of Western Samoa's first reserves in 1958.					
7. Mount Vaea (U)	1,700	1,000-2,000	7:8	++	+
*8. Lata Forest (S)	800	0-550	6:11;12:13	+++	+
9. Cape Puava Forest (S)	120	0-50	3	+++	+++
10. Apolimafof (U)	300	740-850	4:5a	+++	++
11. Vaipu (U)	300	2,700	5a	++	++
12. Maugaloa (S)	200	0-25	10:11	+	+
13. Taupou's Grave Lava (S)	600	2,850-3,350	5a:8	++	++
14. Lake Mafane (S)	750	2,800-3,550	5a:8	++	++
*15. Lake Mautalano (S)	200	600-2,200	6:7:8	++	++
16. Tiavi (U)	200	150-650	6	+	+
17. Fuiipisia/Sopo'aga (U)	40	0-10	5	+	++
18. Matautu (U)	100	0-10	5	++	+++
19. Tufutafoe (S)	10	0-10	5	+++	+
*20. Vailoa (S)	120	0-10	1	++	+++
21. Pata (U)	120	0-10	1	+	++
22. Fusi/Tafitoala (U)	160	0-10	1	+++	+++
*23. Sa'ahapu (U)	50	0-50	1	+	+
24. Sato'alepai (S)					

TABLE 5 (continued)

PROPOSED NATURE RESERVES

	APPROX. AREA (acs.)	ALTITUDE RANGE (ft. a. s. l.)	ECOSYSTEMS PROTECTED	CONSERVATION SIGNIFICANCE	RESERVATION PRIORITY
25. Palolo Deep (U)					
Established as a marine reserve in 1979.					
26. Aganoa (U)	200	0-10	11;12	++	+++
27. Nu'usafe'e Island (U)	230	0-50	13	+++	+++
28. Salamumu (U)	240	0-20	12;13	+++	+++
29. Leanamoea (S)	340	0-10	12	++	++
*30. A'opo Cave (S)	1	540	cave	+++	+

NOTES:

- (1) + moderate ++ high +++ very high
 (2) (U): Upolu (S): Savai'i
 (3) See Table 6 Notes for explanation of "conservation significance", "reservation priority", and "eco-system protected" code.
 (4) * Recommended as strict nature reserves (not open to the public); remainder as managed nature reserves (open to public).

Sources: Table 7 and Notes (1), (2), and (4) = UNDAF Report (1975) 18: A National Parks System for Western Samoa

TABLE 6

PROPOSED HISTORICAL/LEGENDARY SITES

<u>NAME</u>	<u>NATURAL FEATURE</u>	<u>LEGEND</u>
<u>UPOU</u>		
31. Ana i Sengo	Cave (lava tube) with sign of human habitation	Tuamasaga warriors took refuge in the cave. Saved by orator's speech.
32. Sliding Rock	Stream falls over large smooth boulders	Not recorded (area presently used for recreation).
<u>MANONO</u>		
33. Paleso'o (Wall of Stones)	High stone wall at vantage point	Look-out post during tribal wars.
<u>SAVAI'I</u>		
34. Ina'ilau (House of Stones)	Cave (lava tube) with sign of human habitation	House built by men and women; men's work not completed.
35. Vae O Moso (Giant's Footprint)	Unexplained shallow break in basalt	Giant's footprint
36. Taupou's Grave (Virgin's Grave)	Unexplained deep holes in lava	Lava flowed around virgin's grave and nearby church.
37. Mauga Spring	Spring in attractive village setting	Not recorded.
38. Giant Blow Hole	Very large blow hole in iron-bound coast	Not recorded.
39. Lover's Leap	Steep sea cliff	Blind women and child leapt over cliff and turned into sharks.
40. Stone Arch	Natural stone arch on sea coast	Not recorded.
41. Masi Pit	Old stone structure for fermenting bread-fruit	Original pit where this system was initiated on Savai'i.
41a. Mulinu'u Peninsula	Sand and gravel peninsula	Has royal burial sites plus monuments commemorating a disastrous naval incident.
41b. Vaimoso Historical	Hexagonal building	Meeting place for leaders involved in Samoan independence movement.

TABLE 6 (continued)PROPOSED HISTORICAL/LEGENDARY SITES

NOTE:

Most sites occupy approximately one acre or less.

Sources: UNDAT Report (1975) 21 (except items 41a. and 41b added by the author): A National Parks System for Western Samoa

TABLE 7.

PROPOSED ARCHAEOLOGICAL SITES

<u>NAME</u>	<u>APPROX. AREA (acs.)</u>	<u>RESERVATION ESSENTIAL</u>	<u>INVESTIGATED</u>	<u>OPEN TO PUBLIC</u>
<u>UPOLU</u>				
42. Vaialele	45 (3 sites)	no	partially	yes
43. Luatuanu'u	150 (3 sites)	yes	yes	yes
44. Vaigafa	150	yes	yes	not yet
45. Moamo	3	no	no	not yet
46. Mount Olo	300	no	yes (continuing)	yes
<u>MANONO</u>				
47. Manono	1	no	no	yes
<u>SAVAI'I</u>				
48. Palauli	25 (2 sites)	5 acs. only	partially	yes

NOTE:

Reservation essential= Refers to whether acquisition is necessary to protect the site, or protection can be achieved through regulation.

Open to public= Refers to whether or not site could be opened to the public in the immediate future.

Source: UNDAT Report (1975) 22: A National Parks System for Western Samoa

TABLE 8

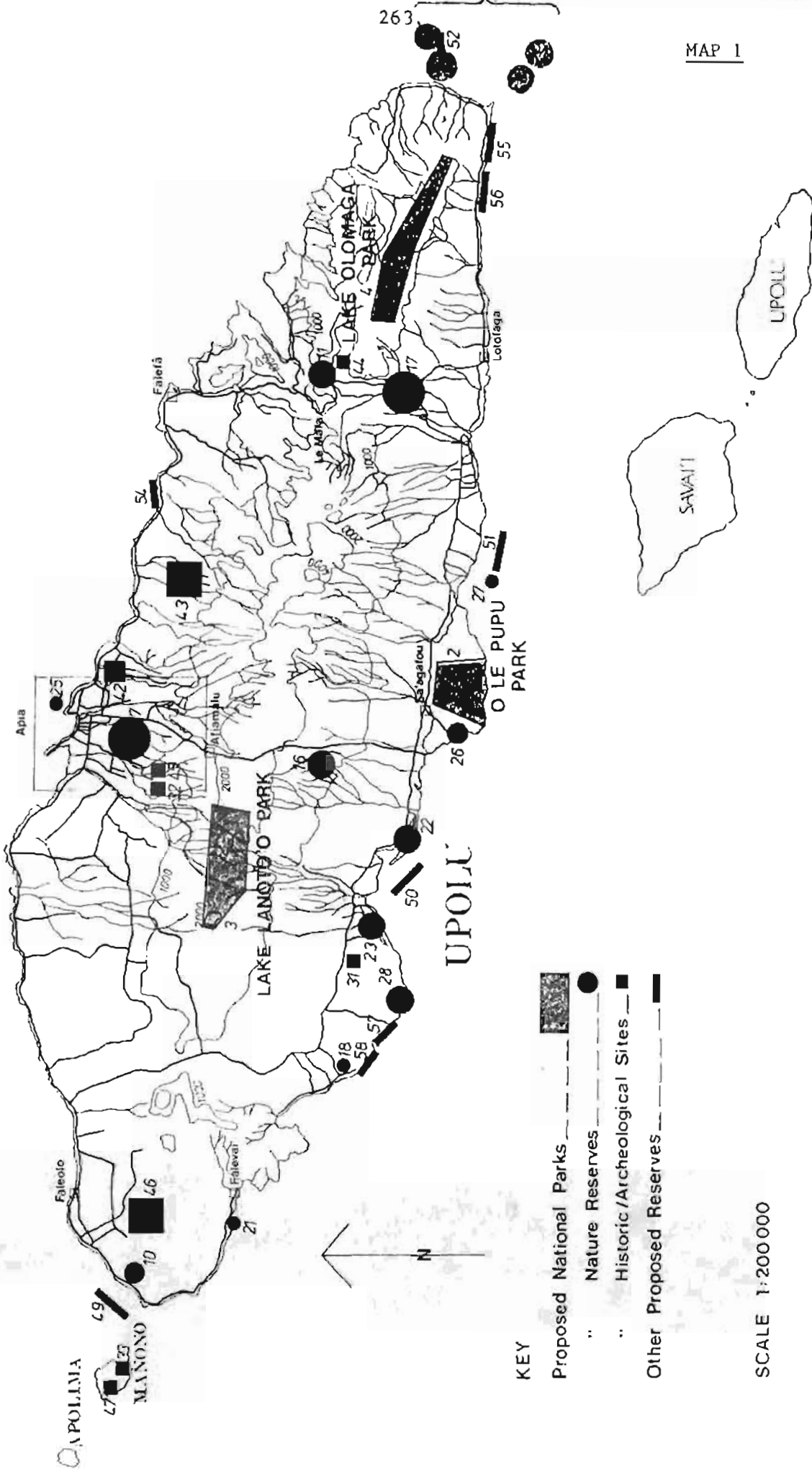
PROPOSED WILDLIFE SANCTUARIESCoral Sanctuaries

<u>NAME</u>	<u>APPROX. LENGTH (miles)*</u>	<u>REEF CONFIGURATION</u>	<u>ASSOCIATED WITH</u>
<u>UPOLU</u>			
49. Satuimalufilufi/ Fuailolo'o	2	good	Apolimafu reserve; close to hotel area, airport, etc.
50. Fusi/Tafitoala	2	good	Fusi/Tafitoala reserve
51. Nu'usafe'e Island/ Tafatafa	2	good	Nu'usafe'e Island reserve
52. Namu'a/Fanuatapu Islands	1	mod. good	Nu'utele Island
<u>SAVAI'I</u>			
53. Satufia	2	mod. good	Leanamoea coastal/ marine reserve

NOTE:

* Length in a straight line, takes no account of configuration.

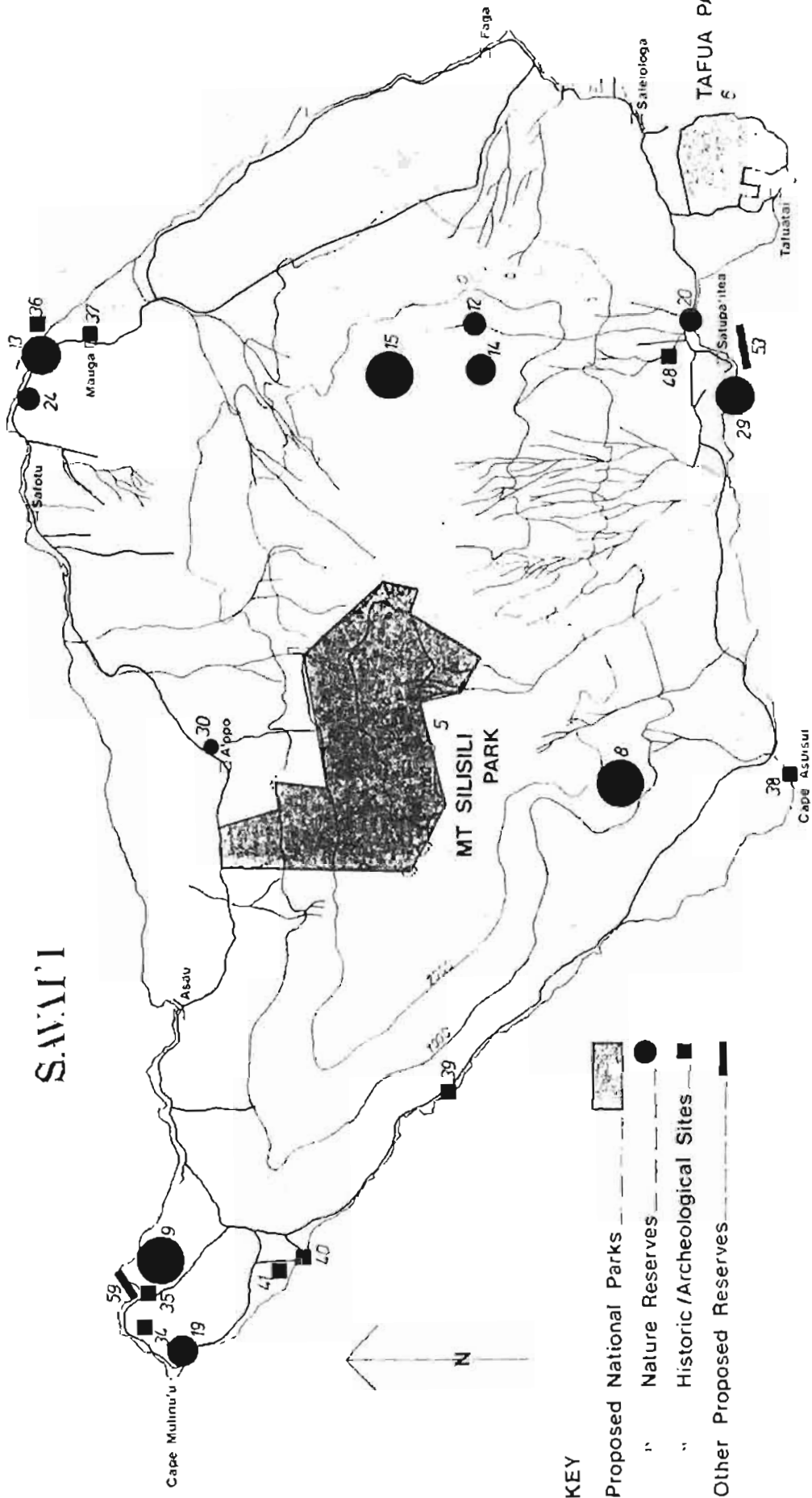
Source: UNDAT Report (1975) 23: A National Parks System for Western Samoa



KEY

- Proposed National Parks ————
- Nature Reserves
- Historic/Archeological Sites
- Other Proposed Reserves ————

SCALE 1:200 000



KEY

- Proposed National Parks [shaded rectangle]
- " Nature Reserves [solid circle]
- " Historic/Archeological Sites [solid square]
- Other Proposed Reserves [dashed line]

SCALE 1:200,000

APPENDIX I

NOTES ON AREAS PROPOSED AS NATIONAL PARKS, NATURE RESERVES AND
ARCHAEOLOGICAL SITES

Source: *A National Parks System for Western Samoa*. UNDAT Report (1975)
pp.63-69.

Information in this Appendix is intended to supplement data provided in Tables 4, 5 and 7. Land ownership is customary except where otherwise stated.

The location of all proposed and existing national parks and reserves are shown on the maps in the Appendix by the number under which they are listed in this section.

NATIONAL PARKS (Ref. Table 4)

1. N'utele Island Group:

Comprises four islets, from north to south: Fanutapu (37 acres), Namu'a (50 acres), Nu'utele (266 acres), and Nu'ulua (61 acres), off the east coast of Upolu. The first two are within the main reef and the other two are outside it. Nu'utele has two small developing reefs and Nu'ulua one, off their respective coasts. Namu'a, which is the only islet owned by the Government, is largely planted with coconuts, Nu'utele has two fairly small coconut groves, and Fanutapu has a few coconuts planted on its north shore. We are informed that there is little or no exotic vegetation on the islands, but this seems unlikely, particularly on Namu'a which was once inhabited, and this statement would need to be checked. Goats were introduced to Namu'a and Nu'ulua earlier in the century and some animals may still be found. Marine turtles still nest on the two southern islets. Numerous sea birds nest on the islets, particularly the booby (*Sula* spp.). All the islets are currently uninhabited but are visited by local villagers, to collect coconuts, and by fishermen.

2. O Le Pupū:

Established as Western Samoa's first national park in 1978.

3. Lake Lanoto'o:

Includes three crater lakes: Lanoto'o (by far the largest), Lanoanea and Lanoataata. Goldfish (*Carassius auratus*) were introduced into Lanoto'o in about 1900 and are thriving; there is at least one other species of fish in the lake. There are numerous birds within the area. A motorable road has been constructed from the main cross-island road to the base of the Lake Lanoto'o cone; it crosses freehold land. Within the proposed park area there are all categories of land ownership. The forest has suffered a certain amount of disturbance is quite open in places. A feral cat was seen near the main lake and at least one *Acacia* sp., now of considerable size, has been planted on the crater rim.

4. Lake Olomaga:

Includes two crater lakes, Olomaga and Lanoto, which are reputed to have particularly numerous and varied bird populations associated with them. It also contains a number of well-developed cones. The forest appears to be little disturbed although there are signs of two or three landslips in steep areas. Cultivation is rapidly encircling the south-easter corner.

5. Mount Sīlisili:
By far the largest park proposal; it contributes about half of the total area proposed for reservation within the parks system. Approximately 1,500 acres are owned by Government. It covers a wide variety of plant and geological formations including a large area of lava flow, in various stages of colonization, and a range of volcanic cones. It also includes the only sizeable block of highland forest (over 4,000 feet a.s. l.) in Western Samoa. Forest cover at high altitudes is relatively open in places, possibly as a result of wind blow. Feral pigs are found within the lower altitude areas and there is said to be a group of feral cattle in the 3-3,500 feet altitudinal range in the northwest. There is no human habitation in the area and relatively little human penetration in general.
6. Tafua:
Possibly the only remaining large block of undisturbed lowland forest on Savai'i, principally because of its very bouldery, broken terrain and poor soil. There is some cultivation along the Tafua access road. Has an iron-bound coast with no reef, or a poorly developed reef, close to the coast. The Tafua village has coconut groves (which have been excluded from the park area) around the edge of the cone in the extreme southwest, but penetration of villagers into the surrounding forest appears to be very limited.

NATURE RESERVES (Ref. Table 5).

7. Mount Vaea:
Established as one of Western Samoa's first reserves in 1958.
8. Lata Forest:
A block of undisturbed foothill forest, situated entirely on public land.
9. Cape Puava Forest:
A relatively undisturbed block of dry lowland forest, of which few, if any, sizeable samples still remain. Situated entirely on freehold land. All the major types of coastal ecosystems are represented on its narrow northern coastline.
10. Apolimafou:
Probably the best remaining example of a lowland rush and reed swamp in Western Samoa. There is a high proportion of ferns in the swamp which suggests that some reduction in water supply may have occurred as a result of its partial surround of coconut groves, and some management of the area may be required to restore it to its original form.
11. Vaipu:
One of only two substantial upland rush and reed swamps in Western Samoa. Some upland scrub and forest, principally in the south. Vegetation elsewhere is low and there is open water in the northeast. The neighbouring swamp of Afulilo may be submerged by a hydro-electric scheme in the foreseeable future.
12. Mangaloa:
A rare example of a sizeable upland swamp forest, situated entirely on public land. The proposed new road on Savai'i will provide access to this region, which includes Lake Mafane and Lake Mataulano (see sites 14 and 15 below).

13. Taupou' Grave Lava Flow:
An interesting and very accessible example of lava flow that is, as yet, only sparsely colonised by scrub. Includes the Taupou's Grave Historic Site (ref. Table 8).
14. Lake Mafane and
15. Lake Mautalano:
Two examples of undisturbed upland primary forest and upland swamp forest, in association with crater lakes. Both areas are situated partially on public land.
16. Tiavi and
17. Fuipisia/Sopo'aga:
Examples of riverain forest, containing a variety of palms and tree ferns on very steep slopes. Numerous species of birds inhabit these valleys, particularly Tiavi. Cultivation on the banks of the Salani River, for the last one and half miles until it reaches the sea, has prevented the extension of the proposed Fuipisia/Sopo'aga reserve as far as the rivery estuary. This reserve includes some public land.
18. Matautu,
19. Tufutafoe and
20. Vailoa:
Three relatively small areas of lowland swamp forest, of which very few examples remain in Western Samoa. Both Tufutafoe and Matautu have been degraded by past exploitation and, probably, coconut plantation establishment up to the very edge of the swamps. It is possible that they could be restored by protection or management techniques. Vailoa consists of two very small alluvial islets in the mouth of the Faleata River, with mangroves at their outer edge, and may represent a rear example of undisturbed, if somewhat atypical, lowland swamp forest. Other examples may be included in the upper reaches of tidal swamp forest reserves (see sites 21-24, below).
21. Pata,
22. Fusi/Tafitoala,
23. Sa'anapu and
24. Sato'alepai:
These areas comprise the largest and least degraded examples of tidal mangrove forest that still exist in Western Samoa. Possibly the very largest and best remaining example of a mangrove swamp occurs in Western Apia, and is soon to disappear under a development project. The Sato'alepai mangroves have been heavily exploited but the site is included to ensure that one area of this type in Savai'i receives protection and that one area in the northern coastal zone is reserved. Both species of mangrove (*Rhizophora mangle* and *Bruguiera conjugata*) and the beach mahoe (*Thespesico populnea*) will be protected by these reserves.
25. Palolo Deep:
Established as a national reserve in 1979.

26. Aganoa,
27. Nu'usafe'e,
28. Salamumu and
29. Leanamoea:
Four examples of coastal beaches (three on the mainland and one islet), which between them cover the main types of coastal formations in Western Samoa and where prohibition of exploitation by fishing and shellfishing is presently feasible. Nu'usafe'e Island is of particular interest because it is understood that it may be of coral origin. Salamumu has special significance because it is a stretch of coast where Palolo (*Ewnice viridis*) is still numerous. The proposed reserve includes a very small rocky islet (*Nu'navasa Island*). Leanamoea includes a coastal freshwater spring.
30. A'opo Cave:
There are numerous caves (lava tubes) in Western Samoa, many of which contain bats, nesting white-rumped swiftlets (*Collocalia spodiopygia*) and a diverse invertebrate fauna. A'opo cave appears to be particularly productive and it is recommended that it be accorded strict nature reserve status. Other, less productive caves could be included in the parks system, in due course, to which visits by the public would be permitted.

ARCHAEOLOGICAL SITES (Ref. Table 7)

42. Vailele:
The archaeological structures consist of very large earthen mounds (in the Tausala, Tapuitia and Papa-i-galagala groups) on three separate sites, on WESTEC land, within a relatively short distance of each other and within easy reach of Apia. There is a good motorable road to the first site; the other sites would have to be visited on foot or the track to these areas would require improvement. Sufficient information exists to enable tentative interpretative material to be prepared, but excavation of selected sites would probably be required to ascertain the full significance of these mounds.
43. Luatuanu'u:
Consists of two ridge top settlements (Tula-i-mata fale and Tula-i-pue), comprising earthen terraces with house pavements and outlines, and earthwork fortifications, with fairly easy access, although the road will require attention; together with a fort at a higher elevation island, which would be inaccessible to all but the more hardy visitor. The areas of the settlements are fern-covered and are not threatened by cultivation or other development. Sufficient data exists for the preparation of interpretive material. Further study, including excavation, would be desirable at some later date.
44. Vaigafa:
A large inland village with numerous individual sites of paths, mounds, ovens, house pavements, house platforms and terraces. Traditionally regarded as an important site in coastal villages such as Latofaga and Salani; cultivation within the area is probably inevitable and could cause some damage to the structures. Scrub clearance would be required if the area were opened to the public. It is adjacent to Vaipu Swamp (see site 11, above) and might be reserved in conjunction with the swamp.

45. Moamoa:

An earthwork fortification, in very good condition, on church land and within very easy reach of the centre of Apia. It has not been studied and would need to be cleared of scrub, mapped and dated before provision of public access is considered.

46. Mount Olo:

A complex of village sites, paths, mounds, ovens, caves and fortifications, within coconut groves on WESTEC land. Cattle grazing of the area poses no serious threat to the structures and keeps the sites clear of undergrowth. The area is within easy reach of Faleolo Airport and of the hotel development projects under consideration for this region of Western Upolu. It is planned to continue archaeological investigation of the area over the next two or three years, but at least part of the area could be opened to the public now, with the provision of good interpretive material.

47. Manono:

A star mound on the highest point of Manono Island. It provides a good view over the island and should probably be included in the historic sites if only because of its unique position.

48. Palauli:

Consists of two principal sites, the first of which includes the largest stone mound presently recorded in Samoa and one of the largest in Polynesia, and the second covers the early European fortification of Uiliamao (village and fort, circa 1840). The former will require further investigation and some reconstruction. It is freehold land and, even if the land is not purchased, the access road will require improvement for visitor access. The Uliamao fortification is under some degree of threat from cultivators; reservation of the area may be necessary and a good footpath from the main road will need to be established.

