

BASIC DATA FOR:

VANUATU

One of 10 Country Reports prepared as part of a joint activity under Grant # LAC-0605-G-SS-6049 from the United States Agency for International Development to The Nature Conservancy.

These reports are necessarily incomplete. Please send all recommendations, comments, criticisms, and new data to:

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12/88



Introduction to the Project

Since the early 1970s, The Nature Conservancy (TNC) has developed a standard methodology for collecting, managing, organizing, storing, and retrieving biological diversity data. This methodology has been applied, tested, and refined in 49 of the 50 United States and in eight Latin American countries. The TNC approach consists of a basic data management structure, the Biological Conservation Database (BCD), and various procedures and protocols for biological conservation program development and management. One aspect of the TNC method is an emphasis on data collection and management at the local level with data collation and interpretation occurring in successively larger regions, until ultimately biological conservation data is collated and interpreted at the global level. TNC is currently working with the International Union for the Conservation of Nature and Natural Resources (IUCN) on refinements for the system so that data collected locally can be more usefully applied in international biological conservation efforts.

For several years, TNC has been considering the possibility of extending its international efforts into the Asia and Pacific region. In January 1988, TNC entered into an agreement with the U. S. Agency for International Development (AID) to evaluate the possibility of building a biological conservation program in the AID South Pacific Region consisting of the countries of Cook Islands, Kiribati, Fiji, Niue, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa. The evaluation was to consist of several parts. These were:

1. the identification of additional data (that is, in addition to data collected in the standard TNC methodology) that would be necessary for a multinational project in a region with many countries, most of which occupy many islands;
2. the collection and organization of this data plus basic information on endemic and threatened taxa and significant ecosystems for the countries of the AID South Pacific Region;
3. the development of country bibliographies on biological conservation;
4. the preparation of 10 country overviews and a regional overview of biological conservation issues and opportunities; and
5. a desirability and feasibility analysis and suggested plan for a TNC and/or AID program in the region.

Progress to Date

Regional Overview and Suggested Plan

On 30 April 1988, I submitted to TNC and AID a document entitled Materials in Support of a Biological Diversity Annex to the Regional Development Strategy Statement (RDSS) for the South Pacific Region Served by USAID. That document contained a regional overview including regional discussions of the distribution of biological diversity, threats to biological diversity, and the relationship between development and biological diversity. Nine regional programmatic opportunities were identified, and are listed here, in order of priority for action:

1. Surveys of Biota, Related Resource Inventories, and Information Management
2. Assistance with the Establishment and Strengthening of National Institutions for the Management of Biological Diversity and Protected Areas
3. Development of Public Information and Secondary School and Teachers' College Curricular Materials for the Management of Biological Diversity
4. Planning and Establishment of Protected Areas
5. Development and Demonstration of Alternative Approaches to Protected Area Establishment on Customary Lands and Waters, with Special Emphasis on Developing and Testing Incentives for the Conservation of Biological Diversity on Non-alienated Customary Lands
6. Extra-curricular and In-service Training of Young Professional in Biological Diversity Conservation Including Environmental Assessment and Planning for and Management of Protected Areas
7. Development of Programs to Respond To and Correct Pollution of Coastal Areas, Especially Reef, Lagoon, and Mangrove Areas
8. Basic Research
9. Legislation

Items 1, 2, and 4 fall well within the areas of TNC expertise and international experience. Item 5 is an area where TNC's experience in the United States with non-acquisition protection methods could be useful to an on-going process supported by the South Pacific Regional Environment Programme (SPREP). SPREP identifies items 1 through 9 as programmatic goals, although the

SPREP order of priority might differ. AID ultimately listed the following priorities for the U. S. federal fiscal years 1990 - 1994:

- a) as part of its overall goal, ensuring that agricultural and marine development activities are designed to minimize any threat to biological diversity and maximize resource conservation;
- b) strengthening its relationship with SPREP and seeking to have conservation of biological diversity given a greater priority in the programmatic activities of SPREP;
- c) supporting the systematic collection and management of information relating to biological diversity;
- d) supporting activities which increase the awareness in island communities of long-term importance of this issue and its relationship to economic development; and
- e) supporting activities which increase the capacity and commitment of island governments in the conservation of biological diversity

(Regional Development Office, South Pacific. 1988 p 44).

The Materials in Support document also included a section titled "Considerations for the Establishment of a Regional Conservation Data Center for the AID Region." This section reviewed the general backgrounds of TNC's international data programs and SPREP's various biological diversity activities before evaluating physical requirements, institutional linkages, and alternative approaches for a TNC regional program. The proposal can be updated and summarized as follows:

1. A regional network of TNC Conservation Data Centers (CDCs) is both desirable and feasible in the South Pacific island region including but not limited to the AID South Pacific Region.
2. Such a network would require permanent (or at least long term) flows of financial and technical support from outside the region.
3. The network would include the following nodes:
 - a. TNC international, national, and Hawaii centers
 - b. SPREP
 - c. sub-national, national, and sub-regional centers

- d. University of the South Pacific
 - (1) Institute for Natural Resources including the South Pacific Regional Herbarium
 - (2) Pacific Information Centre
 - (3) extension offices with satellite and computer linkages
 - e. Bishop Museum
 - f. East-West Center Environment and Policy Institute
 - g. IUCN's Conservation Monitoring Centres, UNEP's GRID system, the data system under development at the University of Papua New Guinea, and other international data bases as appropriate.
4. The best approach to developing the network would be to:
- a. with SPREP involvement, establish a national center (pilot project) in a country where interest is already strong (Western Samoa is recommended);
 - b. work with SPREP to develop a regional data center;
 - c. assist the Bishop Museum with its efforts to develop a specimen data base for the region; and
 - d. begin building linkages with the other nodes listed above.

Limited progress has been made toward actually establishing the network, although such progress was not strictly included in the original project agreement. This progress includes:

- 1. establishment of good working relations, either directly or through correspondence, with many of the key environmental people in the governments of the USAID/RDO/SP Region;
- 2. establishment of good working relations directly with staff at the South Pacific Regional Environment Programme and some key staff at all universities and in some of the environmental PVCs in the USAID/RDO/SP Region;
- 3. agreement in principle among most of those listed in 1. and 2. above on the idea of a regional network of CDCs;

4. establishment of a Department of the Environment in Western Samoa. This Department has an explicit mandate to assess environmental impacts of development projects including impacts on biological diversity;
5. work with Bishop Museum to scope a project to computerize the locations of all Pacific islands specimens in systematics regional collections;
6. negotiation of a Memorandum of Understanding between TNC and EWC for biological diversity conservation in the region;
7. commitments to coordinate with the data base activities managed by Lance Hill at UPNG; and
8. development of support for a project in Western Samoa to map and computerize the maps of vegetation and locations of rare plants and animals for the country.

Progress on the South Pacific Data Base

TNC's BCD system is a relational data base that includes files on elements (rare, threatened, or otherwise significant taxa or communities) global ranks (a compound variable comprised of indices of threats to, abundance and distribution of, and conservation status of elements), individual occurrences of the elements, sites and ownership tracts where the elements occur, managed areas, and TNC projects including protection and stewardship. The current proposal is to add files on countries, islands, and element distributions to the BCD data base. Country files would include the basic information needed by a conservation biologist planning to work in the country. Country files would be supplemented by agency and non-governmental organization files. Island files would serve as geographic unit files and be supplemented by group membership and island synonym files. Country files would be linked with tract and island files. Island files would also be linked with element occurrence, managed area, site, and tract files to produce distribution files..

The data base developed in the current project is not organized in the BCD format. It is, in fact, a set of text documents designed to facilitate the entry of data into the BCD system. The following files have been developed for each country:

Country Basic Files - Data which should eventually be entered into country files in the BCD. The format of the text files approximates the format of the proposed BCD country files.

Taxa and Ecosystem Files - Data which should eventually be entered into element files in the BCD.

Managed Area Files - Data for the BCD managed area files.

Agency and NGO Files - Files which would supplement the BCD country files.

Island Basic Files - Data which should eventually be entered into island files in the BCD. The format of the text files approximates the format of the proposed BCD island files. The island files are coded to correspond with Motteler (1986), a useful gazetteer for the region.

Bibliographies - All of the bibliographic references used in this project are stored in a text-base data base. Topical, geographic, and country keywords are included.

The following pages include individual introductions to the various text files developed during the current project.

Notes:

This introduction is accompanied by a country report including country, taxa, ecosystem, managed area, agency, and NGO files. The data in these files is certainly incomplete. Any additional information you can provide will be greatly appreciated! We especially need additional data on endemic and threatened species, current maps, and agency information. Please send your recommendations, comments, criticisms, and additional data to me:

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	CI	FJ	KI	NI	NG	SI	TO	TU	VA/NH	SA
Agricola 70-88	55	513	23	18	1813	217	83	11	49/71	239
Biosis 69-88	91	722	73	54	3736	551	164	25	76/190	351
SciSearch 74-88	38	305	32	17	1486	168	127	10	79/118	132
Oceanic Abstracts 64-88	27	127	40	5	189	46	82	10	20/49	66
Enviroline 70-88	2	27	1	0	76	9	6	0	3/3	16
Aquatic Science Abstracts 78-88	26	219	81	7	506	73	147	23	79/109	107
Environ. Bibliog. 74-88	2	47	9	0	241	22	8	4	1/1	28

Table 1.

Numbers of bibliographic entries in data bases supported by Dialog for each of the ten island states in the AID South Pacific Region. Search conducted in September 1988.

Key Words

CI = Cook Islands
 FI = Fiji
 KI = Kiribati
 NI = Niue
 NG = New Guinea (Papua New Guinea)
 SI = Solomon Islands
 TO = Tonga
 TU = Tuvalu
 VA = Vanuatu NH = New Hebrides
 SA = Samoa

Introduction

COUNTRY BASIC FILES

- COUNTRY:** The country's most common name. The term "country" applies to a local South Pacific political entity, so New Caledonia would be listed rather than France. This field is intended to serve as a linking field to other files, so standardization is important. Use the short name provided in Bureau of Intelligence and Research (1983).
- SYNONYMS:** The first synonym is the long or official name from Bureau of Intelligence and Research (1983). Other synonyms from the local language, French, German, and Spanish should be provided as appropriate. Do not include island group synonyms unless the island group is perfectly synonymous with the country.
- CMC CODE:** Code used by the IUCN Conservation Monitoring Centers in Cambridge and Kew. The code is geographic, rather than political, so more than one may apply.
- ISO CODE:** International Standards Organization national codes.
- UN CODE:** UN national codes. For some reason, several of the South Pacific Countries have the same code (998).

BASIC GEOGRAPHY

- LATITUDE OF CENTER:** Expressed as degrees and decimal fractions thereof.
- LONGITUDE OF CENTER:**
- NORTH TO SOUTH LATITUDE EXTENT:**
- WEST TO EAST LONGITUDE EXTENT:**
- CONTIGUOUS COUNTRIES:** Based on 200 mile EEZs and negotiated boundaries only.
- TERRESTRIAL AREA:** Express in km².
- EEZ AREA:**
- COMPONENT ISLANDS:** List if 50 or fewer. Otherwise give total number. This is not a linking field.

MEAN ANNUAL PRECIPITATION: Express in mm followed by a dash and the measurement station. For countries with widely spread islands, provide data for several stations if possible.

MEAN MONTHLY MAX PRECIPITATION: Express in mm followed by a dash and the month of occurrence followed by a dash and the measurement station. If needed, provide for several stations as above.

MEAN MONTHLY MIN PRECIPITATION:

MEAN ANNUAL TEMPERATURE: Express in n^o c.

MEAN MAX TEMPERATURE: Express in n^o C followed by a dash and the measurement station. If needed, provide for several stations as above.

MEAN MIN TEMPERATURE:

1985 POPULATION:

ANNUAL GROWTH RATE (1980-1985):

MAPS, IMAGES, AND SURVEYS

List here any important regional references including this country as well as good general quality maps (e.g. planimetric and road maps) for the country.

AERIAL PHOTOS:

Provide dates, scales, coverage, and availability.

SATELLITE IMAGERY:

Provide sources.

TOPOGRAPHIC MAPS:

Provide reference(s) or source code(s) for specific maps, otherwise provide sources for acquisition.

VEGETATION MAPS:

GEOLOGY MAPS:

SOIL SURVEYS:

POLITICAL INFORMATION

POLITICAL STATUS: Select one of the options below and include date of that status.

French Overseas Territory
Independent Democratic Republic
Independent Military Republic
Commonwealth Constitutional Monarchy
Commonwealth Democratic Republic
Commonwealth Limited-democratic Republic (restricted suffrage)
New Zealand Free Associate
New Zealand Territory
UK Territory
US Free Associate
US Commonwealth
US Incorporated Territory
US Unincorporated Territory
UN Trust Territory of the Pacific Islands (US trustee)

CAPITAL ISLAND:

CAPITAL CITY:

SENIOR LEADER: List prime ministers, presidents, governor-generals, heads of state, kings, etc. List the senior leader(s) in the Pacific location.

COMMENTS ON THE POLITICAL SITUATION:

Review the most recent transfer of leadership and such other factors as are useful for evaluating the political climate of the country.

MEMBERSHIP IN INTERNATIONAL CONVENTIONS AND ORGANIZATIONS:

List appropriate international agencies and conventions relating to the environment and the date of accession or membership. In some cases, a larger group of countries (e.g. the Forum states) will bind itself to a treaty if a smaller number of their members accede to it. In such cases, list those which accede.

SPREP FOCAL POINT:

Provide the name, address, and phone number.

THREATS TO BIOLOGICAL DIVERSITY

POPULATION AND LAND-USE THREATS TO BIOLOGICAL DIVERSITY:

Discuss those threats which are directly related to population growth, economic development, and land-use conversions.

ALIEN SPECIES THREATS TO BIOLOGICAL DIVERSITY:

Discuss threats from alien (non-indigenous) species.

OTHER THREATS TO BIOLOGICAL DIVERSITY:

Discuss accidental disasters, pollution, commercial exploitation, and other threats not included above.

LAWS RELATING TO BIOLOGICAL DIVERSITY:

Use the following form:

Standard Citation

Discussion. Source.

LAND TENURE

LAND TENURE NARRATIVE:

Discuss the general nature of land ownership, access, and control, paying particular attention to customary tenure.

TENURE CLASSES: Provide class title, percentage, and source.

Introduction

TAXA FILES

COUNTRY:

TAXA:

Provide here any general information on the relative levels of endemism, the numbers of species, and other indicators of biological diversity. Try to provide this information for the following groups: Plants, Invertebrates, Fish, Amphibians and Reptiles, Birds, Mammals.

ENDEMIC TAXA: Plants etc. Use the following form:

Common name (scientific name) (information about endemism and threats) (sources)

THREATENED TAXA: Mammals etc. as above.

MAJOR COLLECTIONS:

Discuss the herbaria, botanical gardens, zoos, and museums with significant collections from the country's biota. Where would one have to go to collect specimen data for biological diversity data base development? Unfortunately, in most cases, this information is not available.

Introduction

ECOSYSTEM FILES

COUNTRY:

ECOSYSTEMS

Provide here a discussion of the country's major ecosystems.

THREATENED ECOSYSTEMS: Use the following form:

Characteristic or dominant genus
structural or physiognomic type
(source)

Introduction

MANAGED AREA FILES

COUNTRY:

MANAGED AREA SYSTEMS

Use the following form:

Managed Area System Name (Legal Basis in
the form of citations)

Managed Area Name (date: area in km²)
(comments) (source)

Introduction

AGENCY FILES

(This file is restricted to agencies of the governments of the countries in the data base.)

AGENCY RESPONSIBLE FOR: list one or more of the following:

Marine Resources Conservation
Forest Conservation
Parks and Protected Areas
Conservation of Rare, Threatened, or
Endangered Species of Plants and
Animals

AGENCY NAME: List the level most congruent with the area of responsibility, e.g. the Division of Parks rather than the Department of Agriculture (including Parks) or the South Ranger District (within Parks).

COUNTRY WHERE BASED:

SENIOR LEADER: Provide the name and title of the highest ranking manager of the agency at the level named above, e.g. the Director of the Division of Parks.

ADDRESS: Provide the full business address of the Senior Leader.

TELEPHONE:

TELEX:

AGENCY POSITION IN GOVERNMENT:

List the Senior Leader and all appropriate individuals in the chain of command above and below him or her including titles, as follows:

name, Minister of Agriculture
name, Director of Agriculture
name, Director, Parks Division
name, Deputy Director, Parks Division
name, etc.

Introduction

NGO FILES

NGO NAME:

PRIMARY GOALS: If available

GEOGRAPHIC SCOPE: Do not include NGOs with global scope.

KEY PEOPLE, ADDRESSES:

COMMENTS:

COUNTRY BASIC FILES

COUNTRY: Vanuatu
SYNONYMS: Republic of Vanuatu (official)
CMC CODE: LT
ISO CODE: VU
UN CODE: 998 (South Pacific islands)

BASIC GEOGRAPHY

LATITUDE OF CENTER: 18° S. (USDS Office of the Geographer c1985)
LONGITUDE OF CENTER: 168° E. (USDS Office of the Geographer c1985)
NORTH TO SOUTH LATITUDE EXTENT: 12° S. - 25.5° S. (including the EEZs of Matthew and Hunter Islands which are also claimed by France as part of the overseas territory of New Caledonia) (USDS Office of the Geographer c1985)
WEST TO EAST LONGITUDE EXTENT: 163° E. - 173.5° E. (USDS Office of the Geographer c1985)
CONTIGUOUS COUNTRIES: Solomon Islands, Fiji, New Caledonia (USDS Office of the Geographer c1985)
TERRESTRIAL AREA: 14,763 km² (Bureau of Intelligence and Research 1983)
11,880 km² (Dahl 1986, SPC 1987)
EEZ AREA: 680,000 km² (Dahl 1986, SPC 1987)
COMPONENT ISLANDS: 60 islands and reefs with files in this data base; perhaps 80 total
MEAN ANNUAL PRECIPITATION: 2313 mm - Anatom (Taylor 1973)
1780 mm - Erromango (Taylor 1973)
2216 mm - Nguna (Taylor 1973)

MAPS, IMAGES, AND SURVEYS

For regional references, use:

Center for Pacific Islands Studies 1987a,b,c (maps for illustration only)
Defense Mapping Agency 1983 Catalogue of Maps, Charts, and Related Products (charts are very useful for coastal planimetric detail and locating reefs and shoals)
Department of Lands and Survey and External Intelligence Bureau 1986 (atlas)
GeoCenter Internationales 1988 (catalogue)
Hydrographer of the Navy 1985 (catalogue of charts)
Kennedy et al. 1974 (atlas)
Motteler 1986 (gazetteer with planimetric maps)
Pacific Travelers' Supply 1988 (catalogue)
SPC 1984 (regional map)
Thompson 1984 (regional bibliography of geology maps)
USDS Office of the Geographer c1985 (the best regional map, unfortunately not officially published)
Winch 1976 (bibliography)

For general maps of good quality, use:

Defense Mapping Agency 1982 (chart)
Directorate of Overseas Surveys 1975
Hydrographer of the Navy n.d. (charts: Vanuatu, New Hebrides and New Caledonia)
Orthophotographic maps are available, at least for the Port Vila area, but a source has not been identified.

AERIAL PHOTOS:

SATELLITE IMAGERY:

Landsat data and images are available from EOSAT Corporation in Lanham, Maryland and Sioux Falls, South Dakota. Reference NOAA 1982 sheets 14, 20
SPOT data and images are available from ORSTOM in Noumea, New Caledonia and SPOT Data Corporation in Washington, D. C.

TOPOGRAPHIC MAPS:

Defense Mapping Agency n.d.
Institut Geographique National 1976

VEGETATION MAPS:

GEOLOGY MAPS:

See the various New Hebrides Condominium Geological Survey
Regional Geological Reports prepared during the 1960s and
early 1970s.

SOIL SURVEYS:

POLITICAL INFORMATION

POLITICAL STATUS: Independent Democratic Republic (1980)
CAPITAL ISLAND: Efate
CAPITAL CITY: Port Vila (Vila)
SENIOR LEADER: Ati George Sokomanu, President (1980)
Father Walter Lini, Prime Minister (1980)

COMMENTS ON POLITICAL SITUATION:

Following a stroke in February 1987, Father Lini was reelected in November. Barak Sope, his main opposition, has attempted to establish political ties with Libya, but without apparent success. The government of Vanuatu has been sharply critical of the United States' role in the South Pacific.

MEMBERSHIP IN INTERNATIONAL CONVENTIONS AND ORGANIZATIONS

(convention information and memberships from Pulea and Va'ai (1983), organization information from Carter (1984) and Franco et al. (1982)):

Asian Development Bank
Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP Convention; requires 10 instruments of ratification, and so far only Cook Islands and Marshall Islands have deposited such instruments)
Economic and Social Commission for Asia and the Pacific
European Community (associate member)
Food and Agriculture Organization
International Monetary Fund
South Pacific Bureau for Economic Cooperation
South Pacific Commission (1983)
South Pacific Forum
South Pacific Forum Fisheries Agency Convention
UN (1981)
UN Convention on the Law of the Sea
University of the South Pacific
World Bank

SPREP FOCAL POINT:

Dr. Marcus Chambers, Environment Advisor
Environment Unit
Ministry of Lands, Minerals and Fisheries
P. O. Box 151
Port Vila, VANUATU

Telephone 3105

THREATS TO BIOLOGICAL DIVERSITY

POPULATION AND LAND-USE THREATS TO BIOLOGICAL DIVERSITY:

Population growth in Vanuatu is very high, and agricultural (including swidden) pressures on the dry lowlands are extreme. 6% of the land is considered arable (Vargara and Nair 1985). In addition, major timber harvesting concessions have been granted, and land-use conversion is a threat in all but the most rugged and inaccessible areas (SPC 1987, Thamen 1986). Thamen (1986) lists soil destruction, deforestation, overgrazing, and mining as severe problems.

Urban growth has resulted in many Solomon Islanders being unable to gain access to any land for gardens or other uses. Illegal tenancy is becoming a problem, especially around Port Vila (SPC 1987, Thamen 1986).

ALIEN SPECIES THREATS TO BIOLOGICAL DIVERSITY:

Standardization of garden and agricultural crops is probably resulting in the loss of endemic cultivars of Breadfruit (Artocarpus altilis), Kong Taro (Xanthosoma sagittifolium), True Taro (Colocasia esculanta), Giant Taro (Alocasia macrorrhiza), Banana (Musa spp), Kava (Piper methysticum), Yam (Dioscorea spp), and Sweet Potato (Ipomea batatas) (Barrau 1961).

Rats (Rattus rattus, R. exulans, R. norvegicus); feral dogs (Canis familiaris) and cats (Felis domesticus); feral goats (Capra hircus), pigs (Sus scrofa), and other ungulates; and mongooses (Herpestes auropunctatus) are ubiquitous in the region (Thamen 1986). Dahl (1986) mentions those islands where the impacts from some or all these alien species have been avoided.

OTHER THREATS TO BIOLOGICAL DIVERSITY:

Isolated populations of rare species are subject to "accidental" extirpation through the agencies of natural disasters. Thamen (1986) reviews these for Vanuatu and cites tropical cyclones (25 from 1946-76) and moderate seasonality of precipitation with floods moderately common. Earthquakes, landslides, and vulcanism are common on some islands.

Indiscriminant use of pesticides in agriculture, landscaping, and household and urban pest control; illegal poisoning and bombing of fish; and indiscriminant disposal of various pollutants, including sewage, solid wastes, and soluble toxics is resulting in localized environmental damage throughout the region (Dahl 1984, Dahl and Baumgart 1983, Thamen 1986). 585 pesticides are recommended or approved for use in the member states of the South Pacific Commission; 76 of these are banned or restricted in the United

States and/or the European Community (Mowbray 1984 reported in Thamen 1986).

LAWS RELATING TO BIODIVERSITY CONSERVATION

Constitution of the Republic of Vanuatu

The constitution provides that it is the moral duty of every ni-Vanuatu to protect and safeguard the national wealth and environment for current and future generations. This duty can be formalized as law, and public officials are encouraged to do so (Venkatesh et al. 1983). The constitution also provides that "All land in the Republic belongs to indigenous custom owners and their descendents. ... The rules of custom shall form the basis of ownership and use of all land in the Republic. ... Only indigenous citizens of the Republic who have acquired their land in accordance with a recognized system of land tenure shall have perpetual ownership of their land" (quoted in Pulea 1985).

Joint Regulations No. 2 of 1957

This regulation provides for the control of mining through a licensing system (Venkatesh et al. 1983).

Joint (Forestry) Regulations No. 30 of 1964

This regulation restricts tree felling on river banks, and provides for the establishment of Forest Reserves. Forest Areas can be declared, within which tree-felling must be licensed and regulated, and reforestation can be required. Any species of tree can be declared to be protected (Eaton 1985, Venkatesh et al. 1983).

Joint Regulations No. 11 of 1965

This regulation provides for the protection of areas of natural, cultural, or historical importance (Pulea 1984, Venkatesh et al. 1983).

Joint (Wild Life and Bird Protection) Regulations No. 5 of 1967

This regulation protects certain species of birds by licensing and the establishment of taking seasons and the prohibition of their export. Night hunting of birds is forbidden (Venkatesh et al. 1983).

Joint Regulations No. 7 of 1968

The regulation controls the catching of crayfish in coastal waters, establishes taking seasons, and prohibits the catching of undersized individuals and females carrying eggs (Venkatesh et al. 1983).

Land Reform Regulations of 1980

These regulations provide procedures for resolving conflicts between claims regarding land tenure classification (Venkatesh et al. 1983).

Lands Act of (ca 1983-4)

This act Implements the constitutional rule that all land belongs to the native people (Pulea 1984).

LAND TENURE

LAND TENURE NARRATIVE:

The constitution of Vanuatu rules that "all land belongs to the indigenous custom owners and their descendents." Land cannot be alienated, and one cannot own land without being ni-Vanuatu (native). Upon independence, all alienated land was repatriated, but now much of that land (especially the largest parcels) is in the possession of its former owners through state-regulated leases (Carter 1984, Pulea 1985).

TENURE CLASSES:

TAXA FILES

COUNTRY: Vanuatu

TAXA

Vanuatu supports approximately 1,000 native vascular plant species, of which 150 are endemic (Dahl 1986). The IUCN CMC Plant Data Unit has 27 computerized taxon records for Vanuatu, of which 2 are endemic taxa, and none are considered to be threatened (IUCN CMC Threatened Plants Data Unit 1988).

Vanuatu has 71 butterfly species, with 5 endemic to the New Hebrides and 26 shared with PNG and/or Solomon Islands (Dahl 1986). Vanuatu has 4 species of swallowtail butterflies, one of which is endemic to the group (Collins and Morris 1985). Dahl (1986) reports that the Southern New Hebrides support a distinctive insect fauna.

Vanuatu includes 76 species of land snails, of which 57 are endemic (Dahl 1986) including several endemic species of charopid snails (Solem 1976, 1982).

Vanuatu supports 22 species of amphibians and reptiles including 4 endemic lizard species (Dahl 1986).

Vanuatu includes 53 land bird species, of which 2 genera and 4 other species are endemic (Dahl 1986).

Vanuatu provides habitat for 7 endemic bats (Dahl 1986).

ENDEMIC TAXA: Plants
(Agathis obtusa) (Anatom, Erromango) (Dahl 1986)

ENDEMIC TAXA: Amphibians and Reptiles
Anatom Skink (Emoia aneityumensis) (Anatom) (Dahl
1986)
Black-fringed Skink (Emoia nicromarginata)
(Pentecost) (known from 1 specimen) (Dahl
1986)
Speiser's Skink (Emoia speiseri) (Vanuatu) (Dahl
1986)
Saw-tailed Gecko (Perochirus guentheri) (Efate,
Erromango, Anatom) (known from 4 specimens)
(Dahl 1986)

ENDEMIC TAXA: Birds

- Santo Mountain Starling (Aplonis santovestris)
(Espiritu Santo) (Collar and Andrew 1988, King
1981)
- Baker's Pigeon (Ducula bakeri) (Vanuatu) (Dahl
1986, ICBP 1988)
- Chestnut-bellied Kingfisher (Halcyon farquhari)
(Vanuatu) (Dahl 1986, ICBP 1988)
- New Hebrides Flycatcher (Neolage banksiana)
(monospecific genus, Vanuatu) (Dahl 1986, ICBP
1988)
- White-bellied Honey-eater (Phylidonyris notabilis)
(Vanuatu) (Dahl 1986, ICBP 1988)
- Silver-shouldered Fruit Dove (Ptilinopus tannensis)
(Vanuatu) (Dahl 1986, ICBP 1988)
- Yellow-fronted White-eye (Zosterops flavifrons)
(Vanuatu) (Dahl 1986, ICBP 1988)

THREATENED TAXA: Plants
(Agathis obtusa) (Anatom, Erromango) (Dahl
1986)

THREATENED TAXA:

Invertebrates

- black coral (Antipathes dichotima) (Indo-Pacific) (Wells et al. 1983)
Coconut Crab (Birgus latro) (Indo-Pacific) (IUCN CMC and ICBP 1988, Wells et al. 1983)
Triton's Trumpet (Charonia tritonis) (Indo-Pacific) (IUCN CMC and ICBP 1988, Wells et al. 1983)
black coral (Cirrhopathes anguina) (Indo-Pacific) (Wells et al. 1983)
black coral (Cirrhopathes spiralis) (Indo-Pacific) (Wells et al. 1983)
precious corals (Corallium spp.) (Indo-Pacific) (IUCN CMC and ICBP 1988, Wells et al. 1983)
Horses Hoof Clam (Hippopus hippopus) (Indo-Pacific) (IUCN CMC and ICBP 1988, Wells et al. 1983)
Giant Clam (Tridacna gigas) (PNG, Solomon Islands, Vanuatu, Kiribati) (IUCN CMC and ICBP 1988, Wells et al. 1983)
Scaly Clam (Tridacna squamosa) (Indo-Pacific) (IUCN CMC and ICBP 1988, Wells et al. 1983)
Small Giant Clam (Tridacna maxima) (Indo-Pacific) (IUCN CMC and ICBP 1988, Wells et al. 1983)

THREATENED TAXA:

Amphibians and Reptiles

Green Turtle (Chelonia mydas) (Indo-Pacific)
(Groombridge and Wright 1982, IUCN CMC
and ICBP 1988)

Estuarine Crocodile (Crocodylus porosus) (PNG,
Solomon Islands, Vanuatu, and
Belau) (Groombridge and Wright 1982, IUCN
CMC and ICBP 1988)

Black-fringed Skink (Emoia nigrumarginata)
(Pentecost) (known from 1 specimen) (Dahl
1986)

Hawksbill Turtle (Eretmochelys imbricata)
(Indo-Pacific) (Groombridge and Wright
1982, IUCN CMC and ICBP 1988)

Saw-tailed Gecko (Perochirus guentheri) (Efate
and Anatom) (known from 4 specimens)
(Dahl 1986)

THREATENED TAXA:

Birds

Santo Mountain Starling (Aplonis santovestris)
(Espiritu Santo, upland forests) (Collar
and Andrew 1988, IUCN CMC and ICBP 1988,
King 1981)

Thicket Warbler (Cichlornis whitneyi)
(Guadalcanal and Espiritu Santo) (Dahl
1986, IUCN CMC and ICBP 1988)

Peregrin Falcon (Falco peregrinus) (King 1981)

Santa Cruz Ground-dove (Gallicolumba
sanctaeecrucis) (Tinakula and Utupua in
Solomon Islands, Espiritu Santo in
Vanuatu, montane rainforest) (Collar and
Andrew 1988, IUCN CMC and ICBP 1988)

THREATENED TAXA:

Mammals

- Fin Whale (Balaenoptera physalus) (Indo-Pacific, hunted) (IUCN CMC and ICBP 1988, Thornback et al. 1978)
- Blue Whale (Balaenoptera musculus) (Indo-Pacific, hunted) (IUCN CMC and ICBP 1988, Thornback et al. 1978)
- Dugong (Dugong dugong) (Belau, Yap, Guam, PNG, Solomon Islands, Vanuatu, New Caledonia, Australia, heavily hunted) (Thornback and Jenkins 1982)
- Southern Right Whale (Eubalaena australis) (South Pacific) (IUCN CMC and ICBP 1988)
- Humpback Whale (Megaptera novaeangliae) (Indo-Pacific, hunted) (IUCN CMC and ICBP 1988, Thornback et al. 1978)

MAJOR COLLECTIONS:

The B. P. Bishop Museum in Honolulu, Hawaii has approximately 500,000 plant specimens, of which approximately 60% are vascular plants from the SPC region; approximately 5,000,000 land snail specimens, of which approximately 30% are from the SPC region; 13,500,000 insect specimens, of which approximately 70% are from the SPC region; and approximately 10,000 bird specimens, of which approximately 50% are from the SPC region. In each case, the majority of the non-Hawaiian specimens are from Papua New Guinea and Solomon Islands, but all island groups are represented (personal communications with Bishop Museum personnel 1988).

The American Museum of Natural History in New York City has most of the plant and animal (especially bird) collections of the Whitney South Seas Expeditions which visited all of the island groups of the SPC region except the Pitcairn Group, Niue, Tonga, and the Marianas. The bulk of the collections are from Melanesia. See American Museum Novitates from 1920 through the 1940s.

The U. S. National Herbarium at the Smithsonian Institution has over 4,100,000 plant specimens with an unknown but significant percentage from the SPC region. (Holmgren and Stafleu 1981). The herbarium includes the Wilkes expedition collection from Polynesia (all but the Cook Islands) and Fiji and the collections of Fosberg (Micronesia) and Sachet (French Polynesia). All island groups are represented (personal communications with Smithsonian Institution personnel 1988).

The British Museum of Natural History Herbarium in London has over 4,000,000 specimens including extensive collections from Fiji, Kiribati, Papua New Guinea, Solomon Islands, and Tuvalu (Holmgren and Stafleu 1981). These collections probably also include Vanuatu, since the British co-managed the New Hebrides Condominium.

The Reijksherbarium in Leiden has approximately 2.5 million specimens, with excellent representation from Melanesia (Holmgren and Stafleu 1981).

The ORSTOM herbarium in Noumea includes approximately 70,000 vascular plant specimens, of which about 10,000 specimens are from Vanuatu with the remainder from New Caledonia. Most of the Vanuatu specimens were collected by M. Schmid, who also produced several unpublished florulas for islands in the New Hebrides during the 1970s. Copies of these are available from ORSTOM, Noumea, New Caledonia (personal communications with ORSTOM personnel 1988).

ECOSYSTEM FILES

COUNTRY: Vanuatu

ECOSYSTEMS

Dahl (1980a) lists 37 "biomes/habitats" for the province. Of these, lowland rain forest is subdivided into 6 types and swamp forest is subdivided into 5 types.

THREATENED ECOSYSTEMS: swamp forests (Dahl 1980a)
Agathis rain forests (Dahl 1980a)

MANAGED AREA FILES

COUNTRY: Vanuatu

MANAGED AREA SYSTEMS

Forest Reserves (Joint (Forestry)
Regulations No. 30 of 1964)
(none in 1985) (Eaton 1985)

AGENCY FILES

AGENCY RESPONSIBLE FOR: Marine Resources Conservation

AGENCY NAME: Department of Fisheries

COUNTRY WHERE BASED: Vanuatu

SENIOR LEADER: Mr. Wycliff Bakeo, Director

**ADDRESS: Department of Fisheries
P. O. Box 129
Port Vila, VANUATU**

TELEPHONE: 3119

TELEX: 1040 VANGOV NH

AGENCY POSITION IN GOVERNMENT:

**Mr. William Mahit, Minister of Lands, Minerals and Fisheries
P. O. Box 151, Port Vila, VANUATU**

Mr. Wycliff Bakeo, Director, Department of Fisheries

COMMENTS:

Also contact

**Mr. David Esrom, Marine Conservation Officer
Environment Unit
P. O. Box 151
Port Vila, VANUATU**

and

**Dr. Marcus Chambers, Environment Advisor
Environment Unit
Ministry of Lands, Minerals and Fisheries
P. O. Box 151
Port Vila, VANUATU**

AGENCY FILES

AGENCY RESPONSIBLE FOR: Forest Conservation

AGENCY NAME: Department of Agriculture, Forestry and Livestock

COUNTRY WHERE BASED: Vanuatu

SENIOR LEADER: Mr. Douglas Malosu, Director

ADDRESS: Department of Agriculture, Forestry and Livestock
P. O. Box 129
Port Vila, VANUATU

TELEPHONE: 2525

TELEX: 1040 VANGOV NH

AGENCY POSITION IN GOVERNMENT:

Mr. Jack Hopa, Minister of Agriculture, Forestry and Livestock
Mr. Douglas Malosu, Director, Department of Agriculture, Forestry
and Livestock

AGENCY FILES

AGENCY RESPONSIBLE FOR: National Parks, Nature Reserves, and
other Protected Areas

AGENCY NAME: Ministry of Lands, Minerals and Fisheries

COUNTRY WHERE BASED: Vanuatu

SENIOR LEADER: Mr. William Mahit, Minister

ADDRESS: Ministry of Lands, Minerals and Fisheries
P. O. Box 151
Port Vila, VANUATU

TELEPHONE:

TELEX: 1040 VANGOV NH

AGENCY POSITION IN GOVERNMENT:

COMMENTS:

Within the Ministry, the Environment Unit is responsible for identifying potential national parks and nature reserves, the Department of Fisheries is responsible for establishing and managing marine reserves, and the Department of Agriculture, Forestry and Livestock is responsible for establishing and managing terrestrial reserves. New legislation is being planned (10/88), with some consolidation of authority possible.

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Department of Agriculture, Forestry and Livestock
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phone 2525

AGENCY FILES

AGENCY RESPONSIBLE FOR: Conservation of Rare, Threatened, or
Endangered Species of Plants and
Animals

AGENCY NAME: Environment Unit, Ministry of Lands, Minerals and
Fisheries

COUNTRY WHERE BASED: Vanuatu

SENIOR LEADER: Dr. Marcus R. Chambers, Environment Advisor

ADDRESS: Environment Unit
Ministry of Lands, Minerals and Fisheries
P. O. Box 151
Port Vila, VANUATU

TELEPHONE: 3105

TELEX: 1040 VANGOV NH

AGENCY POSITION IN GOVERNMENT:

Mr. Jack Hopa, Minister of Agriculture, Forestry and Fisheries
Dr. Marcus R. Chambers, Environment Advisor, Environment Unit

COMMENTS:

The Fisheries Department enforces regulations for threatened marine species (e.g. Trochus, Coconut Crabs (marine during reproductive phase), Green Snails, Triton Shells). The Agriculture Department is responsible for enforcing bird protection regulations. Each of these departments comes under and can be reached at the address for the Ministry of Lands, Minerals and Fisheries above. New legislation is being drafted (10/88) to give the Environment Unit responsibility for regulating commerce in rare, threatened, or endangered species.

REFERENCES

- Alatalo, R. V. 1982. Bird Species Distributions in the Galapagos and Other Archipelagos: Competition or Chance? *Ecology* 63:881-887.
- Alatoa, H. and P. Lamour (eds.). 1984. Land Tenure in Vanuatu. University of the South Pacific, Suva, Fiji. iv + 87 pp. illus.
- Andrews, E. C. 1940. Origin of the Pacific Insular Floras. *Proceedings of Pacific Science Congress VI (Berkeley 1939)*. 4:613-620.
- Anonymous. 1988. Diners Eating Away the Coconut Crab. *Islands Business* 14(4):53.
- Arutangai, S. 1987. Vanuatu: Overcoming the Colonial Legacy. pp 261-302 in R. G. Crocombe and S. Arutangai (eds.). *Land Tenure in the Pacific*. University of the South Pacific, Suva, Fiji. x + 420 pp. illus.
- Baines, G. B. K. 1984. Environment and Resources Managing the South Pacific's Future. *Ambio* 13(5-6):355-358. illus.
- Baines, G. B. K. 1987. Manipulation of Islands and Men: Sand-Cay Tourism in the South Pacific. pp 16-24 in S. Britton and W. C. Clarke (eds.). *Ambiguous Alternative: Tourism in Small Developing Countries*. University of the South Pacific, Suva, Fiji. vi + 194 pp. illus.
- Baker, J. R. 1925. A Coral Reef in the New Hebrides. *Proceedings of the Zoological Society of London* 66:1007-1019. illus.
- Baker, J. R. 1929. *Man and Animals in the New Hebrides*. Routledge, London, United Kingdom. xiv + 200 pp. illus.
- Balazs, G. H. 1983. Status Review Document for Pacific Sea Turtles. NOAA National Marine Fisheries Service, Southwest Fisheries Center, Honolulu, Hawaii. 16 pp.
- Barrau, J. 1958. Subsistence Agriculture in Melanesia. *Bulletin of the B. P. Bishop Museum* 219. 111 pp. illus.

- Barritt, M. K. 1974/75. A Visit to Matthew and Hunter Islands, Two Little Known Islands in the Hunter Island Ridge, Southeast by East of the New Hebrides Chain. *Sea Swallow* 25:13-15.
- Brigham, W. T. 1900. An Index to the Islands of the Pacific Ocean. *Memoirs of the B. P. Bishop Museum* 1(2):87-257. illus.
- Brookfield, H. C. and D. Hart. 1966. Rainfall in the Tropical Southwest Pacific. Australian National University, Department of Geography Publication G/3, Canberra, Australia. v + 25 pp + 10 maps + 25 tables.
- Brookfield, H. C. and D. Hart. 1971. Melanesia: A Geographical Interpretation of an Island World. Methuen, London, United Kingdom. lx + 464 pp. illus.
- Brown, W. C. 1957. The Distribution of Terrestrial Reptiles in the Islands of the Pacific. *Proceedings of Pacific Science Congress VIII (Quezon City 1953)* 3A:1479-1491.
- Bryan, E. H., Jr. 1943. Pacific War Atlas. Tongg Publishing, Honolulu, Hawaii. 43 pp. illus.
- Bryan, E. H., Jr. 1943. Guide to Pacific Islands. US General Staff, Military Intelligence Divisicn, San Francisco, California. 394 pp. illus.
- Bryan, E. H., Jr. 1972. Guide to Islands in the Tropical Pacific (Polynesia, Micronesia, Melanesia). B. P. Bishop Museum, Honolulu, HI. 26 pp. illus.
- Bryan, E. H., Jr. 1983. Guide to Islands in the Tropical Pacific. unpublished preliminary revised edition, Pacific Science Information Center, B. P. Bishop Museum, Honolulu. 23 pp. illus.
- Bryan, E. H., Jr. n.d. Air Photos of Pacific Islands filed in Bishop Museum. Pacific Scientific Information Center, B. P. Bishop Museum, Honolulu, Hawaii. 105 pp.
- Bureau of Intelligence and Research. 1983. Status of the World's Nations. USDS publication 8735, Washington, D. C. 19 pp.

- Cabalion, P. 1985. Status of Systematics Collections in Vanuatu. pp 44-45 in in S. H. Sohmer. Forum on Systematics Resources in the Pacific. B. P. Bishop Museum, Honolulu, Hawaii. v + 79 pp.
- Cammack, F. M. and S. Saito. 1962. Pacific Island Bibliography. Scarecrow Press, New York, New York. 421 pp.
- Carter, J. 1984. Pacific Islands Year Book (fifteenth edition). Pacific Publications, Sidney, Australia. 557 pp + map. illus.
- Center for Pacific Islands Studies. 1987. The Pacific Islands. no scale. Center for Pacific Islands Studies, University of Hawaii, Honolulu, Hawaii.
- Center for Pacific Islands Studies. 1987. 200 Mile Exclusive Economic Zones of the Pacific Islands. no scale. Center for Pacific Islands Studies, University of Hawaii, Honolulu, Hawaii.
- Center for Pacific Islands Studies. 1987. Political Entities of the Pacific Islands. no scale. Center for Pacific Islands Studies, University of Hawaii, Honolulu, Hawaii.
- Chambers, M. R. 1985. Extinct and Endangered Birds of the South Pacific Commission Region. Ples 1985(1):62-68.
- Chambers, M. R. 1988. completed questionnaire. Environmental Advisor, Environment Unit, Ministry of Lands, Minerals, and Fisheries, Republic of Vanuatu.
- Chang, J. -H. 1968. Rainfall in the Tropical Southwest Pacific. Geographical Review 58(1):142-144.
- Chapman, V. J. 1976. Mangal Vegetation of Papua New Guinea, the Philippines, and Oceania. pp 169-189 in Mangrove Vegetation. Cramer, Vaduz, Liechtenstein. viii + 447 pp + 20 plates. illus.
- Cole, R. V. 1986. Land Policies and Issues in the South Pacific. Islands/Australia Working Paper 86/12, National Centre for Development Studies, Australian National University, Canberra. v + 51 pp.

Collar, N. J. and P. Andrew. 1988. Birds to Watch: The ICBP World Checklist of Threatened Birds. ICBP Technical Publication 8, Cambridge, United Kingdom. xvi + 303 pp.

Collins, N. M. and M. G. Morris. 1985. Threatened Swallowtail Butterflies of the World: The IUCN Red Data Book. IUCN, Gland, Switzerland. vii + 401 pp. illus.

Connell, J. 1984. Islands Under Pressure Population Growth and Urbanization in the South Pacific. *Ambio* 13(5/6):306-308, 310-312. illus.

Conover, H. F. 1943. Islands of the Pacific: A Selected List of References. United States Library of Congress, Washington, D. C. 3 + 181 pp.

Coode, M. J. E. 1969. A Dictionary of the Generic and Family Names of Flowering Plants for the New Guinea and Southwest Pacific Region. Department of Forests, Papua New Guinea, Botany Bulletin 3. 124 + 13 pp.

Corner, E. J. H. 1963. Ficus in the Pacific Region. pp 233-245 in J. L. Gressitt (ed.) Pacific Basin Biogeography, Proceedings of a Symposium, Pacific Science Congress X (Honolulu 1961). B. P. Bishop Museum, Honolulu. ix + 563 pp. illus.

Corner, E. J. H. 1972. Urgent Exploration Needs: Pacific Floras. *Pacific Science Information Bulletin* 24(3/4):17-27.

Corner, E. J. H. and K. E. Lee (eds.). 1975. A Discussion of the Results of the 1971 Royal Society Percy Sladen Expedition to the New Hebrides. *Philosophical Transactions of the Royal Society of London B* 272:267-486. illus.

Crocombe, R. G. 1984. Registration in the Pacific Islands: Experiences and Potentials. pp 26-46 in E. Acquaye and R. G. Crocombe (eds.). Land Tenure and Rural Productivity in the Pacific Islands. University of the South Pacific, Suva, Fiji. vii + 218 pp. illus.

Cumberland, K. B. 1968. Southwest Pacific: A Geography of Australia, New Zealand, and their Pacific Island Neighbors. Praeger, New York, New York. xviii + 423 pp. illus.

Curry-Lindahl, K. 1980. Zoogeographic Subregions of the Pacific Realm as a Background for Terrestrial Ecological Reserves: Part 1, General Introduction and Northern and Western Pacific Regions. Environmental Conservation 7(1):67-76. illus.

Curry-Lindahl, K. 1980. Zoogeographic Subregions of the Pacific Realm as a Background for Terrestrial Ecological Reserves: Part 2, Central and Eastern Regions, etc. with Conclusions. Environmental Conservation 7(2):125-136. illus.

Dahl, A. L. 1980. Regional Ecosystems Survey of the South Pacific Area. SPC Technical Paper 179, Noumea, New Caledonia. i + 99. pp. illus.

Dahl, A. L. 1986. Review of the Protected Areas System in Oceania. UNEP and IUCN Commission on National Parks and Protected Areas, Gland, Switzerland. vii + 73 + 239 pp. illus.

Dale, W. R. and B. C. Waterhouse. 1985. Pacific Islands' Hydrogeology and Water Quality. pp 57-68 in A. L. Dahl and J. Carew-Reid (eds.). Environment and Resources in the Pacific. UNEP Regional Seas Reports and Studies No. 69., Geneva. iv + 294 pp. illus.

Dames, T. W. G. 1955. Soils and Land Use Problems in the South Pacific. SPC, Noumea, New Caledonia. 65 pp.

Darwin, S. P. 1979. A Synopsis of the Indigenous Genera of Pacific Rubiaceae. Allertonia 2(1):1-44. illus.

Davis, S. D., S, J, M, Droop, P. Gregerson, L. Henson, C. J. Leon, J. L. Villa-Lobos, H. Syngé, and J. Zantovska. 1986. Plants in Danger: What Do We Know? IUCN Conservation Monitoring Centre, Kew, Surrey, Richmond, United Kingdom. xiv + 461 pp. illus.

Defense Mapping Agency. New Hebrides. 1:1,000,000. topographic. vegetation structure. USDD, Washington, D. C.

Defense Mapping Agency. 1982. Vanuatu. 1:584,000. Hydrographic Chart 82AC082025, USDD Navy Hydrographic Office, Washington, D. C.

Defense Mapping Agency. 1983. Catalogue of Maps, Charts, and Related Products. Part 2. Hydrographic Products. Volume VIII. Oceania. USDD, Washington, D. C. 30 pp. illus.

Defilipps, R. A. 1987. A Bibliography of Plant Conservation in the Pacific Islands: Endangered Species, Habitat Conversion, Introduced Biota. Atoll Research Bulletin 311. 195 pp. illus.

Department of Lands and Survey and External Intelligence Bureau. 1986. Atlas of the South Pacific. scales vary. Government Printing Office, Wellington, New Zealand. iii + 48 pp + map index.

Diamond, J. M. 1977. Continental and Insular Speciation in Pacific Land Birds. Systematic Zoology 26(3):263-268. illus.

Diamond, J. M. and A. G. Marshall. 1976. Origin of the New Hebridian Fauna. Emu 76:187-200. illus.

Directorate of Overseas Surveys. 1975. New Hebrides Condominium. 1:1,000,000. DOS 865, Directorate of Overseas Surveys, Tolworth, Surrey, United Kingdom. 1 sheet.

Douglas, G. 1969. Draft Checklist of Pacific Oceanic Islands. E. M. Nicholson and L. G. Eldridge (eds.). IBP Technical Meeting on the Conservation of Pacific Islands (Koror and Guam 1968). Micronesica 5(2):327-463 (introduction by E. M. Nicholson).

Dubsky, R. 1986. The Organization of Development Planning in the South Pacific. University of Hawaii, Pacific Islands Studies Program, Honolulu, Hawaii. 197 pp. illus.

Dwyer, L. 1986. Tourism. Islands/Australia Working Paper No. 86/3, National Centre for Development Studies, Australian National University, Canberra. ii + 37 pp.

Eaton, P. 1985. Land Tenure and Conservation: Protected Areas in the South Pacific. South Pacific Regional Environment Programme Topic Review No. 17, SPC, Noumea. 103 pp. illus.

Eaton, P. 1986. Tenure and Taboo: Customary Rights and Conservation in the South Pacific. pp 114-134 in South Pacific Commission. Report of the Third South Pacific National Parks and Reserves Conference (Apia 1985). Volume II. Collected Key Issue and Case Study Papers. Noumea. iii + 295 pp. illus.

Economist Intelligence Unit. 1982. Regional Report No. 12: The South Pacific Islands. International Tourism Quarterly 1982(1):14-34.

Eldridge, L. G. 1987. Bibliography of Marine Ecosystems: Pacific Islands. UNEP Regional Seas Directories and Bibliographies, FAO, Rome. 72 pp.

Fairbairn, T. I. J. 1985. Economic Prospects for the Pacific Islands. pp 44-69 in R. C. Kiste and R. A. Herr (eds.) The Pacific Islands in the Year 2000. University of Hawaii Pacific Islands Studies Program, Honolulu. 170 pp.

Farrell, B. H., D. R. Ross, L. B. Evans, and D. Weertz (Pacific Research Unit, University of California Santa Cruz). 1983. Tourism in the Pacific A Bibliography. Pacific Islands Study Program Working Paper, University of Hawaii, Honolulu, Hawaii. iv + 293 pp.

Fosberg, F. R. 1957. The Vegetation Provinces of the Pacific. Proceedings of Pacific Science Congress VIII (Quezon City 1953) 4:15-23.

Fowler, H. W. 1967. The Fishes of Oceania. reprinted from Memoirs of the B. P. Bishop Museum, volumes 10, 11, and 12. Johnson Reprints, Cramer, Lehre, New York. various pagings. illus.

Franco, A. B., J. F. Dupon, M. P. Hamnett, J. V. Makasiale, J. Roughan, K. Sere, F. Seui, R. Staff, and K. Matsumoto. 1982. Country Profiles: Cook Islands, Fiji, Kiribati, Nauru, Niue, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Western Samoa. EWC Pacific Islands Development Program, Honolulu, Hawaii. 126 pp. illus.

Freeman, O. W. (ed.). 1951. Geography of the Pacific. John Wiley and Sons, New York, New York. xii + 573 pp. illus.

Frodin, D. G. 1984. Oceania. pp 503-533 in Guide to the Standard Floras of the World. Cambridge University Press, London. xx + 619 pp.

Garnett, M. C. 1984. Conservation of Seabirds in the South Pacific Region: A Review. pp 547-558 in J. P. Croxall, P. G. H. Evans, and R. W. Schreiber (eds.). Status and Conservation of the World's Seabirds. ICBP Technical Publication 2, Cambridge, United Kingdom. x + 779 pp. illus.

GeoCenter Internationales. 1988. Geo Katalog. Landkartenhaus, Stuttgart, Federal Republic of Germany. 3 looseleaf volumes. illus.

Gilpin, M. E. and J. M. Diamond. 1980. Subdivision of Nature Reserves and the Maintenance of Species Diversity. Nature 285(5766):567-568. illus.

Government of Vanuatu. 1985. Vanuatu. pp 217-228 in SPREP. Report of the Third South Pacific National Parks and Reserves Conference (Apia 1985): Volume III. Country Reviews. SPC, Noumea, New Caledonia. iii + 269 pp. illus.

Gowers, S. 1978. Some Common Trees of the New Hebrides and their Vernacular Names (revised edition). Department of Agriculture, Forestry Branch, New Hebrides Condominium Government, Port Vila, New Hebrides. 189 pp. illus.

Green, P. S. 1979. Observations on the Phytogeography of the New Hebrides, Lord Howe Island and Norfolk Island. pp 41-53 in D. Bramwell (ed.). Plants and Islands. Academic Press, London. x + 459 pp. illus.

Greenway, M. E., N. W. Posnett, and P. M. Reilly. 1974. New Hebrides and New Caledonia. British Overseas Development Administration, Land Resources Division, Surbiton, United Kingdom. ix + 84 pp.

Gressitt, J. L. 1961. Problems in the Zoogeography of Pacific and Antarctic Insects. B. P. Bishop Museum, Pacific Insects Monograph 2. ii + 127 pp. illus.

- Grigg, R. W. and J. V. Eade. 1981. Precious Corals. Report of the Inshore and Nearshore Resources Training Workshop (Suva). University of Hawaii, Honolulu.
- Groombridge, B. and L. Wright. 1982. The IUCN Amphibia-Reptilia Red Book (second edition). Part 1. Testudines, Crocodylia, Rhynchocephalia. IUCN, Gland, Switzerland. xliii + 426 pp.
- Guilcher, A. 1974. Coral Reefs of the New Hebrides, Melanesia, with Particular Reference to Open Sea, not Fringing, Reefs. Proceedings of the Second International Coral Reef Symposium 2:523-535. illus.
- Guillaumin, A. 1938. A Florula of the Island of Espiritu Santo, one of the New Hebrides. Botanical Journal of the Linnean Society of London 51:547-566. illus.
- Guillaumin, A. 1947-1948. Compendium de la Flore Phanerogamique des Nouvelles-Hebrides. Annales l'Institut Botanique-Geologique des Colonies 55/56:5-58.
- Hay, R. 1985. Bird Conservation in the Pacific Islands. South Pacific Regional Environment Programme Topic Review No. 25 (International Council for Bird Protection Study Report No. 7), SPC, Noumea. vi + 115 pp.
- Hayden, B. P., G. C. Ray, and R. Dolan. 1984. Classification of Coastal and Marine Environments. Environmental Conservation 11(3):199-207. illus.
- Holmgren, P. K. and F. A. Stafleu. 1981. Index Herbariorum: A Guide to the Location and Contents of the World's Public Herbaria (seventh edition). Part I: The Herbaria of the World. Regnum Vegetabile 106. Junk, The Hague, Netherlands. viii + 452 pp.
- Hoyle, M. A. 1978. Forestry and Conservation in the Solomon Islands and the New Hebrides. Tigerpaper 5(2):21-24. illus.
- Hydrographer of the Navy. 1985. Catalogue of Admiralty Charts and Other Hydrographic Publications. Taunton, Somerset, United Kingdom. 176 pp. illus.

Hydrographer of the Navy. n.d. Vanuatu. 1:500,000. Admiralty Charts 1575 and 1576, Taunton, Somerset, United Kingdom. 2 sheets.

Hydrographer of the Navy. n.d. New Hebrides and New Caledonia. 1:600,000. Admiralty Chart 3033, Taunton, Somerset, United Kingdom.

IUCN Conservation Monitoring Centre and International Council for Bird Preservation. 1988. 1988 IUCN Red List of Threatened Animals. IUCN Conservation Monitoring Centre, Cambridge, United Kingdom. xviii + 154 pp.

IUCN Conservation Monitoring Centre, Threatened Plants Data Unit. 1988. unpublished printouts of globally threatened and candidate species for Pacific islands. Kew, Richmond, Surrey, United Kingdom.

IUCN Conservation Monitoring Centre. 1985. IUCN Directory of Protected Areas in Oceania. unpublished photocopy from IUCN CMC, Cambridge, United Kingdom. unpagged.

IUCN Conservation Monitoring Centre. 1985. Towards a Protected Areas Systems Plan for the South Pacific Region. unpublished paper presented at the Third South Pacific National Parks and Reserves Conference (Apia, Western Samoa). IUCN Commission on National Parks and Protected Areas, Gland, Switzerland.

IUCN/SSC Mollusc Specialist Group. 1987. Action Plan for Molluscan Conservation: 1988-1992. unpublished photocopy. IUCN Species Survival Commission, Gland, Switzerland. 9 pp + printout of "threatened, rare and recently extinct molluscs."

Institut Geographique National. 1960-1976. Archipel des Nouvelles Hebrides. 1:50,000. topographic: contour interval = 20 meters. shaded relief. vegetation structure. Paris, France. 29 sheets.

Institut Geographique National. 1976. Vanuatu. 1:500,000. topographic: contour interval = 100 meters. shaded relief. vegetation structure. Paris, France. 2 sheets.

International Council for Bird Preservation. 1988. single island and island group endemics. unpublished printouts. Cambridge, United Kingdom.

- Jackson, M. M. 1986. Pacific Island Studies: A Survey of the Literature. Greenwood Press, New York, New York. xii + 244 pp.
- Jacobs, M. 1982. Assessment of the Deforestation Problem in Malesia. Rijksherbarium, Leiden, The Netherlands. 7 pp.
- Johannes, R. E. 1978. Traditional Marine Conservation Methods in Oceania and Their Demise. Annual Review of Ecology and Systematics 9:349- 364.
- Kaplin, P. A. 1981. Relief, Age and Types of Oceanic Islands. New Zealand Geographer 37(1):3-12.
- Karunaratne, N. D. 1978. Young Nations of the Pacific and the Eco-Crisis. pp 137-150 in A. Mamak and G. McCall (eds.) Paradise Postponed: Essays on Research and Development in the South Pacific. Pergamon Press. NSW Australia. x + 277 pp.
- Kennedy, T. F., J. Petro, and L. Forsdyke. 1974. A Descriptive Atlas of the Pacific Islands (3rd edition). Reed Education, Commercial Print, Wellington, New Zealand. 80 pp. illus.
- King, W. B. 1967. Seabirds of the Tropical Pacific Ocean. Smithsonian Institution, Washington, D. C. xxxii + 126 pp + 11 plates. illus.
- King, W. B., J. A. Vincent, and IUCN Species Survival Commission. 1981. Endangered Birds of the World: The ICBP Bird Red Data Book (second edition). Smithsonian Institution, Washington, D. C. unpagged.
- Kondo, Y. 1980. Endangered Land Snails, Pacific. unpublished photocopy. IUCN Conservation Monitoring Centre, Cambridge, United Kingdom. 15 pp. illus.
- Krauss, N. L. H. 1971. Bibliography of the Torres Islands, Southwest Pacific. Honolulu, Hawaii. 4 pp.
- Krauss, N. L. H. 1971. Bibliography of the Banks Islands, Western Pacific. Honolulu, Hawaii. 10 pp.

- Lane, R. 1971. New Hebrides: Land Tenure Without Land Policy. pp 248-272 in R. G. Crocombe (ed.). Land Tenure in the Pacific. Oxford University Press, Melbourne, Australia. xi + 419 pp.
- Langlois, A. C. 1976. Supplement to Palms of the World. University Presses of Florida, Gainesville, Florida. xiii + 252 pp. illus.
- Lee, K. E. 1972. Proposal for a Forest Sanctuary at Erromanga Island, New Hebrides. unpublished report to the Royal Society Southern Zone Research Committee.
- Macnae, W. 1968. A General Account of the Fauna and Flora of Mangrove Swamps and Forests in the Indo-west Pacific Region. Advances in Marine Biology 6:73-270. illus.
- Marshall, A. G. 1973. A Start to Nature Conservation in the New Hebrides. Biological Conservation 5(1):67-69. illus.
- Marshall, A. G. and Lord Medway. 1976. A Mangrove Community in New Hebrides, South-West Pacific. Biological Journal of the Linnean Society of London 8(4):319-336. illus.
- Marten, K. D. 1985. Tropical Forestry in Melanesia and Some Pacific Islands. pp 115-128 in A. L. Dahl and J. Carew-Reid (eds.). Environment and Resources in the Pacific. UNEP Regional Seas Reports and Studies No. 69., Geneva. iv + 294 pp. illus.
- Massal, E. and J. Barrau. 1956. Some Lesser Known Pacific Food Plants. South Pacific Bulletin 6(3):17-18. illus.
- Mayr, E. 1940. Borders and Subdivisions of the Polynesian Region Based on our Knowledge of the Distribution of Birds. Proceedings of Pacific Science Congress VI (Berkeley 1939). 4:191-195.
- Mayr, E. and F. L. Jacques. 1978. Birds of the Southwest Pacific: A Field Guide to the Birds of the Area Between Samoa, New Caledonia, and Micronesia (new edition). Tuttle, Rutland, Vermont. xxv + 316 pp + 4 plates. illus.

- McCurrach, J. C. 1960. Palms of the World. Harper and Bros, New York, New York. xxxv + 290 pp. illus.
- Merriam Webster Inc. 1984. Webster's New Geographical Dictionary. Springfield, Massachusetts. xxxi + 1376 pp. illus.
- Merrill, E. D. and E. H. Walker. 1947. A Botanical Bibliography of the Islands of the Pacific; and A Subject Index to Elmer D. Merrill's A Botanical Bibliography of the Islands of the Pacific. Contributions from the United States National Herbarium 30(1):1-404.
- Minerbi, L., R. Henning, and F. Quercia. 1983. The 1981 Pacific Islands Pilot Project on Environmental Statistics and the Fiji Field Test: A Summary Report. Department of Urban and Regional Planning, University of Hawaii, Honolulu, Hawaii. variously paged. illus.
- Moore, H. E., Jr. 1966. Palm Hunting Around the World. V. New Guinea to the New Hebrides. Principes 10:64-85. illus.
- Morrison, R. J. and D. M. Leslie. 1982. Bibliography of Soils Information from the South Pacific. pp 383-445 in R. J. Morrison and D. M. Leslie (eds.). Proceedings of the South Pacific Regional Forum on Soil Taxonomy (Suva 1981). University of the South Pacific, Suva, Fiji. 445 pp. illus.
- Motteler, L. S. 1986. Pacific Island Names: A Map and Name Guide to the New Pacific. B. P. Bishop Museum Miscellaneous Publication 34, Honolulu, Hawaii. 91 pp. illus.
- Narokobi, B. 1981. Land in the Vanuatu Constitution. pp 149-156 in A. Bartlett, P. Larmour, R. G. Crocombe, and A. Taungenga (eds.). Land, People and Government: Public Lands Policy in the South Pacific. University of the South Pacific, Suva, Fiji. xiii + 191 pp. illus.
- Naval Photographic Interpretation Center. 1950. A Guide to Pacific Landforms and Vegetation for Use in Photographic Interpretation. United States Department of the Navy, Washington, D. C. variously paged. illus.

- Naya, S. 1983. Asian and Pacific Developing Countries: Performance and Issues. *Asian Development Review* 1(1):1-40. illus.
- Oliver, W. R. B. 1957. Report on the Standing Committee on Pacific Plant Areas. *Proceedings of Pacific Science Congress VIII (Quezon City 1953)* 4:11-15.
- Pacific Information Centre. 1983. *Environmental Issues in the South Pacific: A Preliminary Bibliography*. University of the South Pacific Library, Suva, Fiji for the South Pacific Regional Environment Programme, SPC, Noumea, New Caledonia. ix + 64 pp.
- Pacific Manuscripts Bureau. 1976. *A Gazetteer of Obsolete/Alternative Names of the Pacific Islands*. Research School of Pacific Studies, Australian National University, Canberra, Australia. 26 pp.
- Pacific Travelers' Supply. 1988. *MapLink*. Santa Barbara, California. v + 198 pp + appendix. illus.
- Pearsall, S. H. 1988. *Materials in Support of a Biological Diversity Annex to the Regional Development Strategy Statement (RDSS) for the South Pacific Region Served by USAID*. unpublished photocopy. The Nature Conservancy, South Pacific Regional Biodiversity Project, Honolulu, Hawaii. vi + 125.
- Population Reference Bureau, Inc. 1988. *World Population Sheet*. Washington, D. C. 1 sheet.
- Prescott, J. R. V. 1985. The South Pacific Ocean. pp 180-208 in *The Maritime Political Boundaries of the World*. Methuen, London. xv + 377 pp. illus.
- Pritchard, P. C. H. 1982. Marine Turtles of the South Pacific. pp 253-262 in K. A. Bjorndal (ed.). *Biology and Conservation of Sea Turtles: Proceedings of the World Conference on Sea Turtle Conservation (Washington, D. C. 1979)*. Smithsonian Institution Press in cooperation with the World Wildlife Fund, Washington, D. C. 583 pp. illus.
- Pulea, M. 1984. Environmental Legislation in the Pacific Region. *Ambio* 13(5-6):369-371.

Pulea, M. 1985. Customary Law Relating to the Environment. South Pacific Regional Environment Programme Topic Review 21. SPC, Noumea. x + 37 pp.

Pulea, M. 1985. Legal Measures for Implementation of Environmental Policies in the Pacific Region. pp 157-162 in A. L. Dahl and J. Carew-Reid (eds.). Environment and Resources in the Pacific. UNEP Regional Seas Reports and Studies No. 69., Geneva. iv + 294 pp. illus.

Pulea, M. 1988. The Law, Custom, and Development. unpublished paper presented at the SPREP Workshop on Customary Tenure, Traditional Resource Management and Nature Conservation (Noumea). 16 pp + 2 appendices.

Pulea, M. and A. V. S. Va'ai. 1983. Review of International and Regional Conventions Relevant to the Environmental Management of the South Pacific Region. South Pacific Regional Environment Programme Working Paper. SPC, Noumea. 26 pp.

Quantin, P. 1969. Soil Study in the New Hebrides. South Pacific Bulletin 19(4):26-28. illus.

Raynal, J. 1979. Three Examples of Endangered Nature in the Pacific Ocean. pp 149-150 in I. Hedberg (ed.). Systematic Botany, Plant Utilization, and Biosphere Conservation. Almqvist and Wiksell International, Stockholm, Sweden. 157 + 1 pp. illus.

Regional Development Office, South Pacific. 1988. Regional Development Strategy Statement FY1990-FY1994. USDS Agency for International Development, Washington, D. C. iv + 56 pp + annexes. illus.

Ridgell, R. 1982. European Explorers of the Pacific. p 37 in Pacific Nations and Territories: The Islands of Micronesia, Melanesia, and Polynesia. Guam Community College. viii + 158 pp. illus.

Ridgell, R. 1982. Islands of the Pacific. p 52 in Pacific Nations and Territories: The Islands of Micronesia, Melanesia, and Polynesia. Guam Community College. viii + 158 pp. illus.

- Ridgell, R. 1982. Colonial Acquisition in the Pacific. pp 46-47 in Pacific Nations and Territories: The Islands of Micronesia, Melanesia, and Polynesia. Guam Community College. viii + 158 pp. illus.
- Robbins, R. G. 1972. Vegetation and Man in the South-West Pacific and Papua New Guinea. pp 74-89 in R. G. Ward (ed.) Man in the Pacific Islands: Essays on Geographical Change in the Pacific Islands. Oxford Clarendon Press, London. x + 339 pp. illus.
- Roedelberger, F. A. and V. I. Groschoff. 1967. Wildlife of the South Seas. Viking, New York, New York. 216 pp. illus.
- Routley, R. and V. Routley. 1980. Destructive Forestry in Melanesia and Australia. The Ecologist 10(1/2):56-67. illus.
- Rural Institutes Division. 1972. Bibliography on Land Tenure. FAO, Rome, Italy.
- SPC. 1984. Area Served by the South Pacific Commission. Mercator projection, no scale given. SPC, Noumea, New Caledonia.
- SPC. 1984. Pacific Population and Area Information Sheet. Noumea. 1 sheet xerox.
- SPC. 1985. Recent Comparative Pacific Population Figures. Noumea.
- SPC. 1987. South Pacific Economies: Statistical Summary (9th ed.). South Pacific Commission, Noumea. 60 pp.
- Sachet, M.-H. 1957. The Vegetation of Melanesia: A Summary of the Literature. Proceedings of Pacific Science Congress VIII (Quezon City 1953). 4:35-47.
- Sachet, M.-H. and F. R. Fosberg. 1955. Island Bibliographies. National Academy of Sciences, National Research Council, Washington, D. C. v + 577 pp.
- Sachet, M.-H. and F. R. Fosberg. 1971. Island Bibliographies Supplement. National Academy of Sciences, Pacific Science Board, Washington, D. C. ix + 427 pp.

Sanborn, C. C. and A. J. Nicholson. 1950. Bats from New Caledonia, the Solomon Islands, and New Hebrides. Chicago Natural History Museum Publication 646:313-338. illus.

Schmid, M. P. L. 1970. Florule de Tanna. ORSTOM, Noumea, New Caledonia. 40 pp. illus.

Schmid, M. P. L. 1970. Florule d'Anatom. ORSTOM, Noumea, New Caledonia. 53 pp. illus.

Schmid, M. P. L. 1970. Florule de Tanna, Supplement I. ORSTOM, Noumea, New Caledonia. 21 pp. illus.

Schmid, M. P. L. 1973. Differences and Similarities between the Main Plant Formations of New Caledonia and the Southern New Hebrides. pp 146-149 in Proceedings, Symposium on Planned Utilization of Lowland Tropical Forests (Bogor 1971). Pacific Science Association, Honolulu, Hawaii. x + 263 pp. illus.

Schmid, M. P. L. 1978. The Melanesian Forest Ecosystems (New Caledonia, New Hebrides, Fiji Islands and Solomon Islands). pp 654-683 in UNESCO. Tropical Forest Ecosystems: A State of the Art Report. prepared by UNESCO/UNEP/FAO, Paris. 683 pp. illus.

Schofield, J. C. 1985. Pacific Ocean Islands. pp 1027-1032 in E. C. F. Bird and M. L. Schwartz (eds.). The World's Coastlines. Van Nostrand Reinhold, New York. xiii + 1071 pp. illus.

Simkin, C. G. F. 1980. The South Pacific Islands: Patterns and Strategies of Economic Development, 1975-1990. Economic Bulletin for Asia and Pacific 31(2):77-113.

Smith, A. C. 1955. Phanerogam Genera with Distributions Terminating in Fiji. Journal Arnold Arboretum 36:273-292. illus.

Smith, A. C. 1979. Flora Vitiensis Nova. Pacific Tropical Botanical Garden, Lawai, Hawaii. 5 volumes to date. illus.

Solem, A. 1956. A Systematic and Zoogeographic Survey of the Non-marine Mollusca of the New Hebrides. unpublished dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the University of Michigan. ix + 486 pp. illus.

Solem, A. 1958. Biogeography of the New Hebrides. *Nature* 181:1253-1255. illus.

Solem, A. 1959. Marine Mollusca of the New Hebrides. *Pacific Science* 13(3):253-268. illus.

Solem, A. 1959. Systematics and Zoogeography of the Land and Freshwater Mollusca of the New Hebrides. *Fieldiana, Zoology* 43(1-2):1-359 + 34 plates. illus.

Solem, A. 1962. Notes on and Descriptions of New Hebridean Land Snails. *Bulletin of the British Museum (Natural History) Zoology* 9(5):215-247 + 2 plates. illus.

Solem, A. and discussion by W. F. Smith-Vaniz, V. G. Springer, R. T. Schuh. 1981. Land-Snail Biogeography: A True Snail's Pace of Change. pp 197-237 in G. Nelson and D. E. Rosen. (eds.). *Vicariance Biogeography: A Critique* (proceedings of a symposium, American Museum of Natural History, 1979). Columbia University Press. xvi + 593 pp. illus.

South Pacific Regional Environment Programme. 1985. Action Strategy for Protected Areas in the South Pacific Region. SPC, Noumea, New Caledonia. 21 pp.

Spriggs, M. 1985. pp 410-434 in I. S. Farrington (ed.). *Prehistoric Intensive Agriculture in the Tropics.*, B. A. R. International Series, B. A. R. Oxford, United Kingdom. 2 vols (ix + 881 pp). illus.

Stoddart, D. R. 1968. Isolated Island Communities. *Science Journal* 4(4):32-38. illus.

Stone, B. C. 1967. Notes on the Plant Genus *Pandanus* in Fiji, Tonga, the New Hebrides, and Niue. *Proceedings Biological Society of Washington* 80:47-60. illus.

Survey Department of the New Hebrides. 1979. New Hebrides Official Gazetteer of Place Names. Department of Linguistics, Research School of Pacific Studies, Australian National University, Canberra, Australia for the Survey Department, Port Vila, Vanuatu.

Takhatajan, A. 1986. Floristic Regions of the World. University of California Press, Berkeley. xxii + 522 pp. illus.

Tambe, G. 1988. Reserves in Vanuatu. unpublished paper presented at the SPREP Workshop on Customary Tenure, Traditional Resource Management and Nature Conservation (Noumea). unpagged.

Tamson, R. 1973. Bibliography on Medicinal Plants and Related Subjects. SPC, Noumea, New Caledonia. 102 pp.

Taylor, R. C. 1973. Atlas of Pacific Islands Rainfall. Office of Naval Research by Hawaii Institute of Geophysics, University of Hawaii, Honolulu, Hawaii. variously paged. illus.

Thamen, R. R. 1986. Environmental Issues in the Pacific Islands: Constraints to Sustainable Island Development. unpublished photocopy of a paper presented to the Pacific Circle Consortium "Ocean Project II Conference" (Auckland, New Zealand). 79 pp + tables + map

Thompson, A.-G. 1986. Southwest Pacific: An Annotated Guide to Bibliographies. Australian National University and Academy of Social Sciences, Canberra, Australia. 126 pp.

Thompson, B. N. 1984. Geological Maps of the Islands of the South Pacific. DSIR South Pacific Technical Inventory 4, Wellington, New Zealand. iii + 62 pp. illus.

Thornback, J. and M. Jenkins. 1982. The IUCN Mammal Red Data Book. IUCN, Gland, Switzerland. xl + 516 pp.

Thornback, J., H. A. Goodwin, and C. W. Holloway. 1978. IUCN Red Data Book. Volume 1. Mammalia. IUCN, Morges, Switzerland. not paged.

Thurgood, M. A. 1968. Mangrove Swamp Ecology of the Indo-West-Pacific Region: A Bibliography. University of the Witwatersrand, Johannesburg, South Africa. viii + 44 pp.

Titcomb, M. 1973. Pacific: A Core Collection. Xerox University Microfilms, Ann Arbor, Michigan. vi + 61 pp.

Tsusaka, A. 1984. South Pacific Developing Countries: Development Issues and Challenges. Asian Development Review 2(1):65-31.

Twomey, J. B. 1970. Land Tenure Systems in the Western Pacific High Commission Territories: A Comparative Study. Journal of Administration Overseas 9(2):96-109. illus.

U. S. Board on Geographic Names. 1972. Australia, New Zealand and Oceania. USDS Office of Geography, Gazetteer Supplement, Washington, D. C. iii + 48 pp.

U. S. Board on Geographic Names. 1974. New Hebrides: Official Standard Names. USDS Office of Geography, Washington, D. C. v + 76 pp.

USDS Office of the Geographer. c1985. Claimed and Potential Maritime Zones in the Central and South Pacific. map 1:12,000,000. Washington, D. C.

USGS. 1944. Photo Interpretation of Vegetation in the Tropical Pacific Area and Its Use as an Indicator of Kind of Ground. Military Intelligence Division, U. S. Army Corps of Engineers, Washington, D. C. 115 pp. illus.

USND Hydrographic Office. 1944. Islands of the Central and South Pacific. Gazetteer 7. Washington, D. C. ii + 222 pp. illus.

University of the South Pacific Library. 1981 . South Pacific Bibliography. Suva, Fiji. series.

Van Balgooy, M. M. J. 1960. Preliminary Plant-Geographical Analysis of the Pacific. Blumea 10(2):385-430.

- Van Balgooy, M. M. J. 1971. Plant-Geography of the Pacific As Based on a Census of Phanerogam Genera. *Blumea Supplement* 6. 222 pp. illus.
- Van Balgooy, M. M. J. 1973. Vascular Plants The Altitudinal Range of Some Taxa. pp 171-175 in A. D. Costin and R. H. Groves (eds.) *Nature Conservation in the Pacific*, proceedings of the symposium at Pacific Science Congress XII (Canberra 1971). Australian National University Press, Canberra, Australia. xvi + 337 pp. illus.
- Van Balgooy, M. M. J. 1975. *Pacific Plant Areas* 3. Rijksherbarium, Leiden, The Netherlands. viii + 386 pp. illus.
- Van Balgooy, M. M. J. 1984. *Pacific Plant Areas* 4. Rijksherbarium, Leiden, The Netherlands. viii + 270 pp. illus.
- Van Steenis, C. G. G. J. 1948-. *Flora Malesiana*. Flora Malesiana Foundation, Leiden, The Netherlands. many volumes. illus.
- Van Steenis, C. G. G. J. 1963. *Pacific Plant Areas*, Volume 1. National Institute of Science and Technology, Manila, Philippines. iii + 297 pp. illus.
- Van Steenis, C. G. G. J. 1979. Plant Geography of East Malesia. *Botanical Journal of the Linnean Society of London* 79(2):97-178. illus.
- Van Steenis, C. G. G. J. and M. M. J. Van Balgooy. 1966. *Pacific Plant Areas* 2. *Blumea Supplement* 5. 312 pp. illus.
- Van Trease, H. 1987. *The Politics of Land in Vanuatu*. University of the South Pacific, Suva, Fiji. xiv + 314 pp. illus.
- Venkatesh, S. V., S. Va'ai, and M. Pulea. 1983. An Overview of Environmental Protection Legislation in the South Pacific Countries. *South Pacific Regional Environment Program Topic Review No. 13*, SPC, Noumea. v + 63 pp.
- Vergara, N. T. and P. K. R. Nair. 1985. Agroforestry in the South Pacific Region An Overview. *Agroforestry Systems* 3(4):363-380. illus.

Wells, S. 1985. Information Required for Oceania Protected Areas Systems Review: Brief Notes on Endemic and Threatened Pacific Land Snails. unpublished photocopy. IUCN Conservation Monitoring Centre, Cambridge, United Kingdom. unpagged.

Wells, S. M., R. M. Pyle, and N. M. Collins. 1983. The IUCN Invertebrate Red Data Book. IUCN, Gland, Switzerland. 1 + 632 pp. illus.

Western Pacific Regional Fishery Management Council. 1980. Final Environmental Impact Statement on the Fishery Management Plan for the Precious Coral Fisheries (and Associated Non-precious Corals) of the Western Pacific Region. Honolulu, Hawaii. 4 + 46 + 116 pp. illus.

Wheeler, M. E. 1979. A Bibliography of the Fruit Bat Genus *Pteropus*. Department of Agriculture, Division of Aquatic and Wildlife Resources, Technical Publication 10, Guam. iv + 30 pp. illus.

Whitmore, T. C. 1973. Plate Tectonics and Some Aspects of Pacific Plant Geography. *New Phytologist* 72(5):1185-1190. illus.

Whitmore, T. C. 1976. Conservation Review of Tropical Rainforests: General Considerations and Asia. IUCN, UNEP, WWF from IUCN, Gland, Switzerland. 116 pp. illus.

Wickman, S. B. 1984. Vanuatu. pp 233-255 in F. M. Bunge and M. W. Cooke (eds.) *Oceania: A Regional Study*. U. S. Government Printing Office, Washington, D. C. xv + 572 pp. illus.

Winch, K. L. (ed.). 1976. *International Maps and Atlases in Print* (second edition). Bowker, London, United Kingdom. xvi + 866 pp. illus.