

# **SOLOMON ISLANDS**

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## **INTRODUCTION**

### **Background**

Solomon Islands (5-12°S – 152-170°E) stretches 1700 km northwest to southeast between Bougainville (PNG) and Banks group (Vanuatu) and is the third largest country in the South Pacific after PNG and New Zealand. It has a land area of 27,556 km<sup>2</sup> and an EEZ of 1.34 million km<sup>2</sup>, twice that of Vanuatu and slightly larger than that of Fiji. The Internal Waters (12 mile Zone) is 0.3 million km<sup>2</sup> and this is where most mangrove areas and coral reefs occur.

The country is divided into 9 provinces plus Honiara municipality: (1) Malaita province (2) Guadalcanal province (3) Western province (4) Choiseul province (5) Makira/Ulawa province (6) Isabel province (7) Temotu province (8) Central province and (9) Renbel province. The 1999 national census put the total population of Solomon Islands at 408,358 with a population density of 14 persons per square kilometer and a population growth rate of 3.4% per annum.

The overwhelming majority of people live in coastal communities or villages engaging in the subsistence economy.

### **Tenure**

The Customary Marine Tenure (CMT) system is an important part of the cultures of Solomon Islands and varies between different cultures. CMT has been described as complex and dynamic and recognized under Solomon Islands Constitution (Fisheries Act 1998). Under CMT, coastal areas (mangroves, lagoons and corals reefs) are owned by a kinship group. Owners are part of the coastal setting (or system) and any impacts on the system will have a bearing on them. Success or failure of projects or conservation efforts in coastal areas depends on the support of customary owners.

## **STATUS OF MANGROVES**

A precise definition for the word “mangrove” may not exist but consequently, the term has been used to describe the community as a whole as well as the plants or trees growing in a mangrove habitat. The term “mangrove” now refers to the trees or plants which are restricted to the inter-tidal zone and the term “mangal” defines the community of which mangroves form an integral part. Many other plants are associated with mangroves but these are not exclusive to the habitat.

### **Status of Mangrove Wetlands in Solomon Islands**

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Woodroffe (1987), using Chapman (1970) which recognizes 55 species belonging to 11 families and 16 genera, listed 19 species of mangroves for the Solomons Islands. Oreihaka (1997) and the Pillai and Sirikolo (1997) (Oreihaka, 1997 presumably using the Pillai and Sirikolo 1997) identified 26 species from 13 families and 15 genera (Table 1), using the exclusive mangrove species of Sangar et al (1983), which recognizes 60 species drawn from 16 families and 22 genera. This indicates that the Solomon Island species represents 43% of the world's mangrove species. The report by Pillai and Sirikolo (1997) is the most up to date information on the mangroves of the Solomon Islands.

Recently, Mr. Dako Nating did a comparison study of the biodiversity of the mangroves of east Isabel and Laucala Islands as part of his Masters thesis, with emphasis on flora and fauna (mollusks and crustaceans).

### **Areas under Mangal in Solomon Islands**

Hansell and Wall (1976) estimated the area covered by mangroves in Solomon Islands to be 64,200 hectares. A recent estimate, however, puts it at 52,550 hectares (Solomon Islands National Forest Resources Inventory, 1995). Mangroves account for approximately 3 % of the total land area of 27,556 km<sup>2</sup>.

Mangroves are found on most islands of the Solomons. The distribution of major mangrove stands and species in Solomon Islands as reported by Pillai and Sirikolo (1997) is summarized below.

On Malaita, significant stands of mangroves are found at Lau Lagoon (North Malaita), Langa Langa Lagoon (West Malaita), Are Are Lagoon (Southwest Malaita), and Maramasike Passage (between Small Malaita and Malaita). Nineteen species of mangroves are recorded in the Langa Langa Lagoon with the dominant species being *Rhizophora apiculata*, *R. stylosa* and *Bruguiera gymnorhiza*. The mangroves of Malaita are dominated by *B. gymnorhiza* and *R. apiculata*. Other species reported on the island include *R. mucronata*, *Nypa fruticans*, *Ceriops tagal*, *Heritiera littoralis*, *Scyphiphora hydrophyllacea*, *Xylocarpus granatum*, *Cynometra ramiflora*, *Acanthus ebracteatus*, *Lumnitzera littorea* and *Sonneratia ovata*. *Acrostichum aureum* occurs sporadically.

On Guadalcanal, the mangrove stands are more or less confined to Marau Sound, situated at the eastern extremity of the island. Eleven species of mangroves are recorded in Marau with the dominant species being *Rhizophora stylosa*, *R. apiculata*, *Bruguiera gymnorhiza* and *Lumnitzera littorea*. Other mangrove species recorded in the area include *R. mucronata*, *B. parviflora*, *C. tagal*, *S. ovata*, *Excoecaria agallocha*, *X. granatum*, and *S. hydrophyllacea*. The marine fern, *A. aureum* occurs sporadically.

On San Cristobal (Makira) the mangroves are confined to Star Harbour and the Three Sisters Islands with the dominant mangrove genus being *Rhizophora*.

In the Western Province mangroves are found around Hawthorn Sound, the southern shores of New Georgia Island and in the Marovo Lagoon. Thirteen mangrove species are found in the Hawthorn Sound area with the dominant species being *R. stylosa* and *B. gymnorhiza*. Other mangroves of the area include *R. apiculata*, *R. mucronata*, *C. tagal*, *S. hydrophyllacea*, *A. ebracteatus*, *E. agallocha*, *L. littorea*, *H. littoralis*, *S. ovata* and *X. granatum*. Leary (1993b) reported the dominant species of the Marovo lagoon to be

*Rhizophora* spp with local concentrations of *L. littorea*, *H. littoralis*, *X. granatum* and *Bruguiera* spp.

The largest stands of mangroves on Santa Isabel are found around Western Santa Isabel, the Arnarvon Islands (Arnavon Marine Conservation Area), between San Jorge Island and the mainland, the Thousand Ships Bay, and the Ortega Channel. The dominant mangroves of Western Santa Isabel are *Rhizophora* spp and *Bruguiera* spp. *L. littorea* is also prevalent (Leary, 1993b).

On Choiseul, mangroves are found at the southeastern end of the island, including Waghena and Rob Roy Islands, as well as the northwestern end of the island. Leary (1993b) reported the dominant mangrove species of Eastern Choiseul to be *R. stylosa* and *R. apiculata* with local concentrations of *S. caseolaris* and *N. fruticans*. Other mangrove species which are found on the island include *Bruguiera* spp, *L. littorea* and *X. granatum* .

In the Central Province, the largest stands of mangroves occur along the entire length of Mboli (Utaha) Passage separating the islands Nggela Sule and Nggela Pile (Florida Islands). Fourteen species of mangroves are recorded in the passage.

The mangroves of Temotu Province are dominated by *R. apiculata* and *B. gymnorhiza*. Other common species include *L. littorea*, *R. stylosa* and *H. littoralis*.

In summary, the Solomon Islands mangrove flora is dominated by *Rhizophora* and *Bruguiera*. *Lumnitzera* is also fairly common.

**Table 1. Mangrove species of the Solomon Islands**

Family	Species
Acanthaceae	<i>Acanthus ebracteatus</i> Vahl. 1791 <i>Acanthus ilicifolius</i> L. 1753
Avicenniaceae	<i>Avicennia alba</i> Blume 1826 <i>Avicennia eucalyptifolia</i> (Zipp. ex Miq.) Moldenke 1960 <i>Avicennia marina</i> (Forsk.) Vierh. 1907 <i>Avicennia officinalis</i> L. 1753
Combretaceae	<i>Lumnitzera littorea</i> (Jack) Voigt. 1845
Euphorbiaceae	<i>Excoecaria agallocha</i> L. 1759
Leguminosae	<i>Cynometra ramiflora</i> L. 1753
Meliaceae	<i>Xylocarpus granatum</i> Koenig 1784 <i>Xylocarpus moluccensis</i> (Lamk.) Roem 1846
Myrsinaceae	<i>Aegiceras corniculatum</i> (L.) Blanco 1837
Myrtaceae	<i>Osbornia octodonta</i> F. Muell. 1862
Palmae	<i>Nypa fruticans</i> (Thunb.) Wurmb. 1781
Rhizophoraceae	<i>Bruguiera gymnorhiza</i> (L.) Lamk. 1797-8 <i>Bruguiera parviflora</i> Wight & Arnold ex Griffith 1936 <i>Bruguiera sexangula</i> (Lour.) Poiret 1816 <i>Ceriops tagal</i> (Perrottet) C.B.Robinson 1908 <i>Rhizophora apiculata</i> Blume 1827

*Rhizophora mucronata* Lam. 1804  
*Rhizophora stylosa* Griff. 1854

Rubiaceae                      *Scyphiphora hydrophyllacea* Gaertn. 1805

Sonneratiaceae    *Sonneratia alba* J. Smith 1819  
*Sonneratia caseolaris* (L.) Engl. 1897  
*Sonneratia ovata* Backer 1929

Sterculiaceae                *Heritiera littoralis* Dryand. in Aiton 1789

Source: Pillai and Sirikolo (1997)

Although not exclusive to the intertidal zone, the following plants have also been recorded in the mangal in Solomon Islands. These are, *Pemphis acidula*, *Dolichandrone spathacea*, *Hibiscus tiliaceus*, *Calophyllum inophyllum*, *Pandanus spp*, *Cocos nucifera*, *Acrostichum aureum*, *Barringtonia racemosa*, *Brownlowia argentata*, *Cerbera floribunda*, *Cerbera manghas*, *Clerodendrum inerme*, *Thespesia populnea*, and *Myristica hollrungii* (Table 2).

**Table 2.            Some important, non-exclusive species of shrubs and trees found in the mangal**

Family	Species
Pteridaceae	<i>Acrostichum aureum</i> L. 1753
Lecythidaceae	<i>Barringtonia racemosa</i> (L.) Spreng 1826
Tiliaceae	<i>Brownlowia argentata</i> Kurz 1870
Apocynaceae	<i>Cerbera floribunda</i> K Schumann 1889 <i>Cerbera manghas</i> L. 1753
Verbenaceae	<i>Clerodendrum inerme</i> (L.) Gaertn. 1805
Bignoniaceae	<i>Dolichandrone spathacea</i> (L.f.) K. Schumann 1889
Malvaceae	<i>Hibiscus tiliaceus</i> L. 1753 <i>Thespesia populnea</i> (L.) Solander ex Correa 1807
Myristicaceae	<i>Myristica hollrungii</i> Warb. 1897
Lythraceae	<i>Pemphis acidula</i> Forst. 1776

Source: Pillai and Sirikolo (1997)

## Mangrove Fauna

Despite only a few mangrove related studies being undertaken in Solomon Islands, it is obvious that the mangroves of the country are rich in biodiversity. Given the land area and proximity to Papua New Guinea, which lies in the biogeographic region where the main concentrations of mangroves occur, this is not surprising. Besides plants, bacteria, fungi, lichens and algae, almost all major groups of animals, from protozoa to mammalia are represented in the mangal.

In Solomon Islands a variety of resident organisms, eg barnacles, limpets, oysters, periwinkles, crabs and mudskippers (*Periopthalmus* spp) are closely dependent on mangroves for food or space. Additionally, non-resident fauna such as fish, insects, saltwater crocodiles, birds, bats visit the ecosystem from time to time in search of shelter, food and mates.

The mangrove swamps harbour many species which are of economic value and constitute an important human food resource. These include oysters, clams, gastropods, cephalopods and crustaceans such as the mangrove-lobster (*Thalassina anomala*), commercially important prawns (e.g. *Penaeus* spp), the coconut crab (*Birgus latro*), the land crab (*Cardisoma* spp), mud-crab (*Scylla serrata*) and hermit crabs (*Uca* spp).

Many of the fish species are economically important food fishes, for example snappers, mullets, rabbit fishes, jacks, emperors and groupers use the mangrove. 136 species of fish from 13 families from estuaries have been recorded to date in the Solomon Islands (Blaber & Milton, in Leary, 1993a). Sharks and several species of rays also enter mangal waters.

The saltwater crocodile, *Crocodylus porosus*, is the best known reptile occurring in the mangrove habitat and all the 5 species of turtles found in the Solomon Islands (the hawksbill (*Eretmochyles imbricata*), the green turtle (*Chelonia mydas*), the leatherback turtle (*Dermochyles coriacea*), the loggerhead turtle (*Caretta caretta*), and the Olive Ridley turtle (*Lepidochelys olivace*) visit mangal waters. The Mangrove Monitor, *Varanus indicus spinulosus* and a number of snakes, lizards, geckos are present in the mangal.

It may well be that some of the 173 resident species of birds of the country live in the mangal, or visit the mangal for food. Other avian species, for example shore birds and migratory birds may also exploit the mangrove habitat.

Mammals utilising Solomon Islands mangroves include bats, rats, and presumably the marsupial possum, *Phalanger orientalis*, not to mention humans. Sea-cows, *Dugong dugong*, also browse in waters associated with mangroves.

### Uses of Mangroves of the Solomon Islands

As seen above, many living organisms rely on the mangrove ecosystem. Mangrove habitats also provide an array of uses to humans, directly or indirectly. On the subsistence level (in Solomon Islands), humans rely heavily on the mangrove and the animals associated with it for a variety of products including food, firewood, building materials and medicine. Table 3 present the main uses of mangrove plants in Solomon Islands.

**Table 3. Uses of mangroves of the Solomons**

Species	Uses
<i>Acanthus ebracteatus</i>	Used medicinally to cure boils; fuelwood
<i>Acanthus ilicifolius</i>	Fuelwood
<i>Avicennia alba</i>	Fruits are used as food; used medicinally to cure boils; fuelwood
<i>Avicennia eucalyptifolia</i>	As for other members of the genus
<i>Avicennia marina</i>	As for other members of the genus
<i>Avicennia officinalis</i>	As for other members of the genus
<i>Lumnitzera littorea</i>	Durable timber, used as construction and building material; stem is used for poling canoe; flowers used for decoration; fuelwood
<i>Excoecaria agallocha</i>	Used as poison, the latex of the plant is mixed with oil of <i>Cerbera</i> to catch fish; leaves used as medicine as an analgesic for body ache
<i>Cynometra ramiflora</i>	Fuelwood
<i>Xylocarpus granatum</i>	Bark is used medicinally for the treatment of diarrhoea and dysentery; dyes; construction and building material; fuelwood
<i>Xylocarpus moluccensis</i>	Used in furniture making; fuelwood
<i>Aegicerous corniculatum</i>	Fuelwood

<i>Osbornia octodonta</i>	Fuelwood
<i>Nypa fruticans</i>	One of the most useful mangroves: young seeds are edible and yields sugar/alcohol; young shoots are used medicinally; young leaves used for making skirts for “kastom” (custom) dancing and other traditional ceremonies; leaves are used for thatching, for making umbrellas, hats, mats, fish aggregating devices etc; leaf stalks are used as fuelwood (and arrows in the past).
<i>Bruguiera gymnorhiza</i>	Propagules are used as food; used medicinally, in the treatment of malaria; tannin for the manufacture of adhesives and leather (and in the past for the preservation of fishing nets/lines); charcoal; construction and building material; sapling is used for making spear handle; stem is used for making pestle (for crushing food prior to cooking); sharpened stem is used for husking coconut; fuelwood
<i>Bruguiera parviflora</i>	Construction and building material; sapling is used for making spear handle and for husking coconut; fuelwood
<i>Bruguiera sexangula</i>	Construction and building material; sapling is used for making spear handle and for husking coconut; fuelwood
<i>Ceriops tagal</i>	Durable timber, used as construction and building material; dyes; sapling is used for making spear handle and for husking coconut; fuelwood
<i>Rhizophora apiculata</i>	Tannin for the manufacture of adhesives and leather (and in the past for the preservation of fishing nets/lines); dyes for tapa -making; construction and building material; stem is used for making pestle (used for crushing food prior to cooking); sapling is used for making spear handle and for husking coconut; charcoal; fuelwood
<i>Rhizophora mucronata</i>	Tannin for the manufacture of adhesives and leather (and in the past for the preservation of fishing nets/lines); dyes; construction and building material; sapling is used for making spear handle and for husking coconut; fuelwood
<i>Rhizophora stylosa</i>	Dyes; sapling is used for making spear handle and for husking coconut; fuelwood
<i>Scyphiphora hydrophyllacea</i>	Fuelwood
<i>Sonneratia alba</i>	Fruits are used as food; used medicinally as internal and external medication; (making bows in the past); dye for tapa-making; pneumatophores are used as floats for fishing lines; fuelwood
<i>Sonneratia caseolaris</i>	As for other members of the genus
<i>Sonneratia ovata</i>	As for other members of the genus
<i>Heritiera littoralis</i>	Used medicinally for the treatment of diarrhoea and dysentery; durable timber, used as construction and building material; construction of canoes; fruits are used as toys for babies and infants; fuelwood

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Source: Pillai and Sirikolo (1997)

## THREATS TO MANGALS

Destruction of mangals is a global concern. Mangals are destroyed as the result of reclamation for urban development/settlement, conversion to salt pans, agriculture, aquaculture, sewage and toxic chemicals disposal (released into them), siltation (silt from land-based development smothers the roots of mangroves), and over-exploitation (they are over-exploited by traditional users for timber, firewood, food, medicine etc).

In Solomon Islands, mangroves are under increasing threat from activities such as logging, mining, reclamation for human settlement, waste disposal and over-exploitation by traditional users. In some parts of the country, (eg Are Are Lagoon) mangroves are the major source of firewood for households (domestic use) and for drying beche-de-mer and copra. Pillai and Sirikolo (1997) reported that mangrove trees are being logged in Marau Sound (Guadalcanal), Langa Langa Lagoon (Malaita) and possibly elsewhere in the country. Mangrove areas are increasingly being used for settlement as villages grow as the result of the increasing growth of coastal populations of the country. This is evident in Are Are and Lau lagoons on Malaita, around Western Isabel, Southeastern Choiseul and parts of Western Province (eg Marovo lagoon and around Munda/Noro area). Many log storage points used by loggers on Isabel are reclaimed mangrove areas.

The mangrove resources of the Solomon Islands will have to be utilized in a sustainable way or else it will be wiped out in the near future.

## **CONSERVATION AND SUSTAINABLE USE OF MANGROVE**

### **Management and Legal Obligation**

Solomon Islands is well aware of the important roles coastal resources play in the life of her people. As such, maintaining the benefits derived from coastal resources is paramount and the Government through its technical Divisions has drawn up appropriate policies and legislation to safeguard the development of resources. Furthermore, through its technical Divisions, the Government has also drawn up various programs that would protect the biodiversity, especially those that are of high commercial value and are prone to over-exploitation.

The Solomon Islands National Environmental Management Strategy (1993), is the blueprint for sustainable development in Solomon Islands and provides the foundation for implementing much of Agenda 21.

In line with Government policies (on marine resources) and the principles of sustainable development, sustainable management and conservation of coastal marine resources, Solomon Islands has enacted three legislations in 1998. These are the Fisheries Act 1998, The Environment Act 1998 and The Shipping Act 1998.

*The Fisheries Act 1998* revised the laws relating to Fisheries and made provisions for the proper management and development of Fisheries in Solomon Islands. The Act highlighted several principles that the Minister has to take into consideration when exercising his powers and functions as provided for under the Act, one of which is that the Minister shall have regard to the principle that Solomon Islands fisheries resources shall be managed, developed and conserved so as to ensure resources are not endangered through over-exploitation but are utilized at a level that ensure their optimum sustainable yield. It also advocates the principle of sustainable development and applies the precautionary approach to conservation, management and exploitation of fisheries resources in order to protect the fisheries resources and preserve the marine environment. In this context, exploitation of fisheries resources in Solomon Islands shall be done through properly devised management plans. Marine Conservation Areas may be declared under this Act. Traditionally, some Solomon Islands communities impose temporal closures on coastal resources (within mangrove and adjacent coral reefs). The

closures are often referred to as taboo areas, reserves or conservation areas and are imposed by chiefs and based on traditional ownership or marine tenure (CMT).

One of the important aspects of the Act is that it recognizes the customary rights holders over or in relation to any area within Solomon Islands waters. As seen above, CMT system is an important part of the cultures of Solomon Islands. Through CMT, resource owners are part of the coastal setting (or system) and any impacts on the system will have a bearing on them.

Through *The Environment Act 1998*, Solomon Islands has matched its national policy on environment and conservation through the enactment of this legislation to promote sustainable development through sustainable management. The legislation is in compliance with our international obligations. The objectives of the Environment Act 1998 are that it shall make provision for and establish integrated systems of development control, environment impact assessment and pollution control. It shall also prevent, control and monitor pollution. The Act caters for national and regional environmental concerns.

Through *The Shipping Act 1998*, the protection of the marine environment and prevention of marine pollution from vessels will be regulated. Under this Act, the Marine Division would have the authority to prosecute violations of the Act. The Act incorporates various IMO Conventions.

The Solomon Islands does not have a specific Wetland Policy and legislation but the Ministry of Forest Environment and Conservation (MFEC) is the coordinating Government Agency for mangroves and wetland related matters. Through this Ministry, the Government has done preparatory work to nominate Lauvi Lagoon (technically a lake) on Guadalcanal for the RAMSAR site but the ethnic strife on Guadalcanal has halted further development.

On the other hand, Solomon Islands has signed the Kyoto Protocol and is a party to the Convention on Biological Diversity (CBD).

Community based conservation is increasingly becoming acceptable in Solomon Islands, as a result of combined efforts by the Government, NGOs like The Nature Conservancy and World Wildlife Fund for Nature (WWF) through education and awareness programmes. In Isabel and Choiseul Provinces, TNC is a major partner in the 6 years old Arnavon Marine Conservation Area and the WWF has been successful in helping communities in Marovo lagoon (Western Province) establish community managed conservation areas which include some mangroves areas. Education and awareness are important to make communities aware that they are stakeholders, and they must realise that conservation can bring them benefits.

### **Conservation and Sustainable use**

The 10-point NEMS (National Environment Management Strategy) proposal provides an excellent framework for sustainable use and conservation of the biodiversity of the country, including mangroves.

If the Solomon Islands is to retain what remains of its rich mangrove biodiversity then it is essential that human activities affecting mangroves and their environment are managed properly. In other words, we must ensure that: all economic development - land or sea



based - is in harmony with ecological principles; environmental awareness is fostered in school children and the general public; research is carried out to determine accurately the total area under mangrove cover and an inventory of mangrove species diversity and richness is prepared; areas of high ecological, wilderness and cultural value are protected; waste management is improved and pollution of mangals is minimised; an environmentally sound coastal zone strategy is put in place; extensively damaged mangrove habitats are reforested; and traditional and non-traditional users of mangrove resources strictly adhere to the principle of sustainable use.

The Solomon Islands should adopt an integrated approach to physical planning/ economic development on the one hand, and environmental protection in the country, on the other. Such a strategy would require an appropriate legal framework of environmental law with built-in routine environmental impact assessment, together with the means for its enforcement.

For effective environment management it is imperative that the Solomon Islands public is well informed and supportive. This calls for mounting both formal and informal environmental education. Appropriate curricula at the primary, secondary and tertiary levels of education should be designed and implemented. Concomitantly community education be undertaken.

The mangrove resource database needs to be improved. Firstly, the areal extent of mangroves in the Solomons should be determined accurately. A comprehensive survey of mangrove species diversity and richness should be undertaken. Equally, all other mangal flora and mangrove fauna should be surveyed and documented.

The Solomons has unique flora and fauna. Destruction of mangrove habitats could lead to the extinction of rare plants and animals which inhabit the mangal. Loss of mangroves would be harmful also to many non-residents, such as insects, fish, reptiles, birds and mammals, including humans, who visit the mangrove environment in search of food, shelter etc. Mangrove ecosystems of ecological and scientific value should be protected. NEMS' proposal that, amongst others, the Marovo Lagoon, Lake Tenggano and Arnarvon Islands Group be declared as World Heritage Sites, is a step in the right direction. Similarly, the Marau Sound and other sites rich in mangrove biodiversity should be converted into marine parks and protected.

The Solomon Islands is increasingly becoming polluted with greenhouse gases, hazardous chemicals, solid wastes and sewage, particularly around urban centres. Disposal of raw sewage into the sea in coastal villages and the lighting of grass fires around villages and towns are also contributing to an increase in the levels of pollution. The problem should be addressed through the vehicle of formal and informal education. Appropriate legal instruments will have to be designed and enforced.

## **References**

Chapman, V.J. 1970. Mangrove phytosociology. *Tropical Ecology* 11: 1-19

Hansell, J.R.F and Wall, J.R.D.1976. Land resources of the Solomon Islands. Volume 1: Introduction and Recommendations. Land Resources Study 18, Land Resources Division, Ministry of Overseas Development, Surrey, England.

Leary, T. 1993a. Solomon Islands State of the Environment Report. SPREP, Apia, Western Samoa.

Leary, T. 1993b. *In*: Directory of Wetlands of Oceania. The International Waterfowl and Wetlands Research Bureau (IWRB) and Asian Wetland Bureau (AWB). pp331-361.

Oreihaka E., 1997. Freshwater and marine aquatic resources in Solomon Islands. Unpublished report for Fisheries Division, Department of Agriculture and Fisheries, Honiara, Solomon Islands, 60 p.

Pillai, G and Sirikolo, Q. M., 1997. Mangroves of the Solomon Islands. (In Prep.), IMR, USP.

Saengar, P., E.J. Hegerl and J.D.S Davie. 1983. Global Status of Mangrove Ecosystems. International Union for Conservation of Nature and Natural Resources. pp88.

Solomon Islands National Environment Management Strategy (NEMS). 1993. SPREP, Western Samoa. 160pp

Solomon Islands National Forest Resources Inventory, Vol 1-9. 1995. Ministry of Forest, Environment & Conservation, Honiara, Solomon Islands.

Woodroffe, C. D. 1987. Pacific Islands Mangroves: Distribution and Environmental Settings. *Pacific Science* 41(1-4): 166-185.