FIJI

Introduction

Area: 18,272 sq.km.
Population: 827,900 (2007).

Fiji is an independent island republic in the South Pacific, situated between latitudes 15° South and 21° South and straddling the 180th meridian from 177° West to 175° East. The 320 or so islands form a complex group of high islands of volcanic origin, with barrier reefs, atolls, sand cays and raised coral islands. The two largest islands, Viti Levu (10,386 sq.km) and Vanua Levu (5,535 sq.km), together comprise 87% of the total land area. Two smaller islands, Taveuni (435 sq.km) and Kadavu (408 sq.km), account for a further 4.6% of the land area, and most of the remaining islands are very small. Less than a hundred of the islands are inhabited, most of the population being concentrated in the towns, villages and lowlands of the two larger land masses. The annual population growth is 2% and the population density is 39 inhabitants per sq.km. Suva, the capital city, is located on a peninsula near the southeastern corner of Viti Levu. Fiji has an equable maritime climate, a consequence of its high topography and prevailing winds, the Southeast Trades. The west coast of Viti Levu is in a rain shadow, and thus experiences a distinct dry season. Maximum and minimum temperatures for Suva are 30°C and 20.5°C respectively. The dry season extends from May to October, and the wet season from November to April. Mean relative humidities are 80% and 75% at 0800 hrs and 1400 hrs respectively on the east coast, and about 10% lower on the west coast. Relative humidities as low as 40% can occur during the dry season.

Both Viti Levu and Vanua Levu have mountainous interiors, with peaks rising to 1,323 m and 1,032 m respectively. The uplands of both islands were formerly covered in tropical rainforest, but much of this has now been replaced with secondary forest and grassland on the lower slopes. Farm land occupies most flattish lowland, and large areas on both islands are under cultivation for sugar cane. Mangrove forest occurs widely along the coastline and at river mouths. Coral cays tend to be dominated by palms, panda -pits and casuarinas.

Fiji NBSAP identified the different ecosystems and habitat types of its rich biodiversity. Many species are endemic. There are about 1,500 native species of vascular plants, of which 40-50% are endemic. All 26 palm species are endemic. There are 39 species of butterfly (including seven endemics), 27 species of reptiles and amphibians (including eight endemics) and about 120 species of birds (including 22 endemics)

Summary of Wetland Situation
The Government of Fiji as part of its Ramsar Convention accession process endorsed the Upper Navua Conservation Area as its first Ramsar Site. Fiji has further established a Fiji Wetlands Working Group that since 1999 have compiled information in the Fiji Wetlands Information Database of 42 wetlands sites of national and international significance.

The wetlands of Fiji can be broadly divided into five main categories: mangrove forests, peat bogs, rivers, lakes and reservoirs.

Mangroves
It has been estimated that from the original 41,000 ha of mangrove forest, 38,543 ha remain intact. The majority of the mangrove forests are located on the mouths of the larger rivers, the Ba, Rewa and Nadi Rivers on Viti Levu and the Labasa River on Vanua Levu. All but about 2,000 ha of the remaining mangrove are on the two large islands of Viti Levu and Vanua Levu, with the Rewa, Ba and Labasa deltas alone supporting a combined total of 10,683 ha, or 28% of the national resource.

Fiji's mangrove flora is composed of eight mangrove species and a unique hybrid. It is dominated by *Bruguiera gymnorrhiza ("dogo"), Rhizophora stylosa and Rhizophora samoensis (both "tiri")* and a sterile hybrid *R. x selala ("selala")* which is a cross between *Rhizophora stylosa* and *Rhizophora samoensis*. The naturally occurring hybrid *Rhizophora x selala* is of great scientific interest because it is only found in Fiji, Tonga and New Caledonia with Fiji having the greatest area of the hybrid (Watling 1985).

The loss of mangroves in Fiji has been caused by reclamation for agriculture, aquaculture, and in recent years the principal threat has been reclamation for urbanization, tourism and industrial development. There is also some over-exploitation of mangroves to satisfy the demands for fuelwood, which account for approximately 1000-

2000m3 per year.

Peat swamps
Freshwater wetlands occupy only 0.3% of Fiji's land area. Much the most extensive freshwater wetlands are peat swamps which occur widely on the two main islands. The largest peat swamp is Bonatoa (870 ha) on Viti Levu, which provides a good example of zoned vegetation. Reclamation of swamp land has taken place on a large scale, and few freshwater wetlands now survive undisturbed. Tonuve Swamp (the only site in Fiji with Navosa reed peat) has been totally reclaimed for agriculture, while many others have suffered a smaller percentage loss to development.

Rivers
The larger islands are well-watered, with many permanent rivers and streams. However, only Viti Levu has rivers of any considerable size. Over 70% of this island is drained by three large river systems, the Rewa, Navua and Sigatoka, which enter the sea along the south coast. The catchment area of the largest of these, the Rewa, covers nearly one third of the island. Fiji's two most economically important rivers, the Ba and the Nadi, have a combined catchment of only 15% of Viti Levu, all of which is in the dry zone. The Upper Navua Catchment Area is now the only Ramsar Site in Fiji. The rivers of Vanua Levu are short with only the Dreketi River being of any considerable size (55 km long). Riverine forest occurs along the lower reaches of some of the larger rivers, and is sometimes characterized by distinctive species such as the endemic palm *Neoveitchia storckii*.

The Government of Fiji as part of its Ramsar Convention accession process in endorsed the Upper Navua Conservation Area as its first Ramsar Site.

Lakes
There are few freshwater lakes in Fiji, and those that do exist are small and generally limited to mountainous regions. The largest, Lake Tagimaucia on Taveuni Island, is only 2 3 ha in area. The only significant brackish and saline lakes are Ngalongalo Lake, Ngasauva Salt Lagoon and Lake Ndrano on Vanua Levu, and a small marine lake on uaqava (Vuanggava) Island in the Lau Group.

Reservoirs
Two major dams have been constructed in Fiji, both on Viti Levu. The smaller Vaturu Dam (160 ha) provides water to the dry western division of Viti Levu, and the larger Mono savu Dam (670 ha) provides hydro-electricity. A smaller dam (80 ha) has recently been built at the Wainikavika Creek near Navua to provide water for rice irrigation.

Fiji has further established a Fiji Wetlands Working Group that since 1999 have been working in identifying and documenting the 42 wetlands sites of national and international significance into the Fiji Wetlands Information Database.

Protected Area System
At present, the protected areas system in Fiji comprises 18 forest reserves, seven nature reserves (established within the forest reserves) and a number of forest parks and amenity reserves. There is only one National Park, established in 1988 to protect the Sigatoka sand dunes, and one Wildlife Sanctuary, established in 1981 to protect a large population of the endemic *Crested Iguana (Brachylophus vitiensis)* on Yadua Taba Island (Anon., 1989; IUCN, 1991a). The Koryanitu Coservation Area established in 1994 is part of a community-based conservation area approach that has the Native Land Trust Board managing the area in partnership with the traditional communities of the area.

Flora And Fauna
Fiji's mangrove flora and fauna has been well documented by Macrae (1968), Richmond and Ackerman (1975), Lal et al. (1983), Lal (1984a, 1984b), Fiji Mangrove Management Committee (1987) and others. During the 1980's some work was done on freshwater and brackish fauna including Ryan (1980, 1984) who described the brackish and freshwater fish and the amphibians of Fiji, while Southern et al. (1986) described the fauna of Lake Tagimaucia on Taveuni. Over the past seven years (2001–2007) there has been an increasing interest in the biodiversity of freshwater and brackish fishes in the Fijian archipelago. In 2000 and again in 2001, Wetlands International –Oceania, in association with the University of the South Pacific, ran a series of short courses on the diversity and taxonomy of freshwater fishes in Fiji for wetland managers. Since this time these two organizations have taken a lead role in surveying and documenting freshwater fishes from the archipelago (Jenkins, 2001; Jenkins & Boseto, 2003; Waqairatu, 2003; Jenkins, 2004; Jenkins & Boseto, 2005; Jenkins, 2005; Boseto, 2006; Jenkins, Boseto & Watson 2008, submitted). Additional freshwater food fish survey work has also been done by

the Fiji Institute of Technology in 2002 and some freshwater biodiversity surveys were also initiated by the Wildlife Conservation Society in 2003. This work has resulted in a significant increase in our understanding of the biodiversity of freshwater and brackish systems. This recent work built on the past lists of Whitley (1927), Fowler (1959), Ryan (1980, 1981), Andrews (1985), Beumer (1985), Lewis and Pring (1986) and at present 161 species from 45 families of freshwater and estuarine fishes are recognized in the Fiji Islands. Of these, 10 are non-native introduced species and 10 species are considered endemic to the Fijian Islands. Voucher specimens are held for most species at the University of the South Pacific, Marine Studies collections with additional specimens being held at the museums listed in the acknowledgements below. A full listing of museum and collection holdings can be found in Boseto, 2006.

Fiji's 10 species of endemic freshwater fishes are as follows: *Mesopristes kneri, Redigobius leveri, Schismatogobius vitiensis, Redigobius sp., Glossogobius sp., Akihito sp., Stiphodon sp.1, Stiphodon sp.2, Sicyopus sp*., Sygnathidae (New Genus, new species). The two *Stiphodon sp* and the *Sicyopus* are now in press. Further details can be gained upon request from Wetlands International -Oceania.

Wetland Research

The Fiji Wetlands Committee has been conducting research on the wetland sites of national and international significance in Fiji. Prior to this, most of the research was on mangrove and marine ecosystems. Work on the mangroves has been summarized by Thaman, et al (2003). Ramsar sheets with documentation of 8 wetland sites of national and international significance for Fiji have been compiled by the Fiji Wetlands Committee over the past 8 years.

Wetland Area Legislation

There are no specific legislations addressing wetland protection in Fiji although several pieces of legislation address components. The Environment Act provides for the broad environmental protection and conservation of important areas, and environmental impact assessment, Rivers and Stream Acts 1985 provides for the protection of river and stream edges; Forest Decree 1992 provides for the establishment of Forest Protected Areas; Fisheries Act 1985 provides for the protection of marine areas and regulation of marine species utilization.

The Fiji National Biodiversity Strategy and Action Plan identify priority actions for the conservation and sustainable use of Fiji's biodiversity, including priority ecosystems and species for conservation.

The Fiji Wetlands Committee established in 1999 which includes Government Ministries and NGO's has been the driving force behind the establishment of Ramsar sites and the documentation of biodiversity in wetland areas of national and international significance.

At international level, Fiji has ratified the Convention on the Conservation of Nature in the South Pacific (Apia Convention), the Convention for the Protection of the Natural Resources and Environment of the South Pacific (SPREP Convention), Convention on Biological Diversity, the World Heritage Convention, the and Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and the Convention on the International Trade of Endangered Species (CITES).

Wetland Area Administration

Wetland administration is under several controls of several agencies. The management of reservoirs are controlled by the Fiji Electricity Authority and Water Department, while Marine Reserves are either under the Department of Fisheries or Department of Environment. The management of wetlands in forest reserves are under the Department of Forestry. Large portions of the catchments of these reservoirs are in native land, and are thus under no conservation obligation.

Organizations involved with Wetlands

The Department of Environment through its Environment Act has now been charged with the main coordinating body for wetland protection or management in Fiji. DOE further coordinates the Fiji Wetlands Committee that was established in 1999 which includes representatives of the following:

Department of Environment; Department of Forestry; Department of Fisheries; Fijian Affairs Board; Native Land Trust Board (NLTB); University of the South Pacific; National Trust for Fiji; Wetlands International WWF-Fiji Program; Live and Learn Fiji; Foundation of the Peoples of the South Pacific; Birdlife International

References

Andrews, S. 1985. Aquatic species introduced to Fiji. *Domodomo, Journal of the Fiji Museum,* **3(2)**: 67 – 81.

Beumer, J.P. 1985. The eel resources of Fiji. *Queensland Department of Primary Industries Study Report*

QS85010. QDPA, Brisbane, Australia. 33pp.

Boseto, D. 2006. Distribution and abundance of Fijian freshwater fishes. MSc Thesis. University of the South Pacific.

Boseto, D. and A.P. Jenkins 2006. A checklist of fresh and brackish water fishes of the Fiji Islands. www.wetlands.org. 9 pgs.

Fowler, H.W. 1959. Fishes of Fiji. Government of Fiji. Suva.

Jenkins, A.P., 2002. Standard coral reef monitoring techniques for managers and communities. Report to the Northern Territory University (Centre for Tropical Wetlands Management) and Environment Australia (Natural Heritage Trust). Wetlands International – Oceania. John Gorton Building, Canberra, ACT 2601. 33 pgs.

Jenkins, A.P. and Boseto D. 2003. A preliminary investigation of priority ichthyofauna and watershed ecosystem services for assessing representation in Fiji's forest reserve network. Report to Wildlife Conservation Society. 34 pps.

Jenkins, A.P. 2003. A preliminary investigation of priority ichthyofauna and watershed ecosystem services for assessing representation in Fiji's forest reserve network. Report to Wildlife Conservation Society. 37 pps.

Jenkins, A.P. 2004. *Freshwater fishes of Waisai Creek and allied hotsprings systems*. Wetlands International, Suva, Fiji Islands. 20pp.*).*

Jenkins, A.P. and D. Boseto. 2005. *Schismatogobius vitiensis,* a new freshwater goby (Teleostei:Gobiidae) from the Fiji Islands. Ichthyological Exploration of Freshwaters. 16:1, pp. 75-82

Jenkins, A.P. 2005. A preliminary study of freshwater fauna and water quality of Kubuna River and tributaries with recommendations for conservation action. Wetlands International – Oceania. John Gorton Building, Canberra, ACT 2601. 14 pgs.

Jenkins, A.P. and D. Boseto. 2005. *Schismatogobius vitiensis,* a new freshwater goby (Teleostei:Gobiidae) from the Fiji Islands. Ichthyological Exploration of Freshwaters. 16:1, pp. 75-82

Jenkins, A.P. 2005. A preliminary study of freshwater fauna and water quality of Kubuna River and tributaries with recommendations for conservation action. Wetlands International – Oceania. John Gorton Building, Canberra, ACT 2601. 14 pgs.

Jenkins, A.P., Sykes, H., Skelton,P., Fiu, M. and E. Lovell. 2005. Marine biodiversity of Cakau Levu (Great Sea Reef) and associated coastal habitats. World Wildlife Fund. 207 pgs.

Jenkins, A.P., Boseto, D. and K. Mailautoka. 2006. Aquatic fauna and water quality in five catchments in Macuata Province, Vanua Levu, Fiji Islands. Wetlands International- Oceania. Canberra ACT. 21pgs.

Jenkins, A.P. 2006. A review of seven freshwater ecoregions in Oceania based on diversity of freshwater ichthyofauna: Fiji, Solomon Islands, New Caledonia, Vanuatu, Lord Howe Island, Norfolk Island and the Hawaiian Islands. Report to World Wildlife Fund. 12pgs.

Jenkins, A.P. 2007. Endemism and amphidromy in freshwater fishes of insular Melanesia: critical species and processes for conservation. Proceedings of Society for Conservation Biology, Australasian Section. 17 pp .

Jenkins, A.P. 2007. Faunal connectivity for island wetland conservation. Melanesian Geo.Vol 4. pp 12 -16.

Jenkins, A.P., Mailautoka, K., Raikabula, A. and W. Naisilisili. 2007. Ichthyofauna and water quality in two catchments in Bua Province, Vanua Levu, Fiji Islands. Wetlands International- Oceania. Canberra ACT. 19 pgs.

Jenkins, A.P., Boseto, D. and R.Watson. 2008. Freshwater fishes from Fiji of the subfamily Sicydiinae, with descriptions of three new species (Teleostei: Gobioidei) and notes on their ecology. Ichthyological Exploration of Freshwaters. (accepted pending revision)

Lewis, A.D. and Pring, C.K. 1986. Freshwater and brackishwater fish and fisheries of Fiji. pp 38 – 59. In T. Petr (eds), *Reports and papers presented at the Indo-Pacific Fishery Commission Expert Consultation on inland fisheries of the larger Indo-Pacific islands*. Bangkok, Thailand, 4-6 August 1986. FAO Fish. Reports (371) Supplement.

McCosker, J.E , D. Boseto, and A. Jenkins 2007. Redescription of *Yirrkala gjellerupi* (Weber & de Beaufort, 1916), a poorly-known freshwater Indo-Pacific Snake Eel (Anguilliformes: Ophichthidae). Pacific Science 61:1 pp.141-144.

Ryan, P.A. 1980. A checklist of the brackish and freshwater fish of Fiji. *South Pacific Journal of Natural Science,* **1***:* 58 – 73.

Ryan, P.A. 1981. Records of the three new freshwater fishes of the Fiji Islands. *Pacific Science,* **35 (1):** 93 – 95.

Ryan, P.A. 1991. The success of the Gobiidae in tropical Pacific insular streams. *New Zealand Journal of Zoology,* **18**: 25 – 30.

Reid, G.M. and A.P. Jenkins. 2007. Regional priorities and opportunities for freshwater fish conservation. Keynote paper for 6th Triennial Wetlands Members Meeting, Shaoxing, China. Wetlands International. 17pgs. (+ppt presentation)

Reynolds,J.,Tawake,A.,Radikedike, P., Jenkins, A. and P. Led. 2005. Comparing Pineapples and Bananas: Meta-Analysis for Lessons Learned in Locally-Managed Marine Areas, South Pacific. Proceedings of the American Fisheries Society, Anchorage, Alaska. 10ppgs

Waqairatu, S.S. 2003. An inter and intra-creek study of tilapia introduction to Fiji fresh and brackish waters: determining salinity tolerance range of *Oreochromis mossambicus* and its possible ecological impacts. MS411-Special topics in Marine Science project. Marine Studies programme, USP, Suva, Fiji Islands. *(Unpublished report).*

Whitley, G. P. 1927. A checklist of fishes recorded from Fijian waters. *Pan-Pacific Research Institute Journal*, **2 (1):** 38.

Compact discs

Jenkins, A.P., 2002. Asia Pacific Wetland Managers' Training Program: Training course "*Standard coral reef monitoring techniques for managers and communities*." Wetlands International-Oceania, University of the South Pacific.

Jenkins, A.P. 2001. Asia Pacific Wetland Managers' Training Program: Training course "*FreshwaterFishes of Fiji: advanced taxonomy, identification and applications for wetland management*." Wetlands International-Oceania, University of the South Pacific.

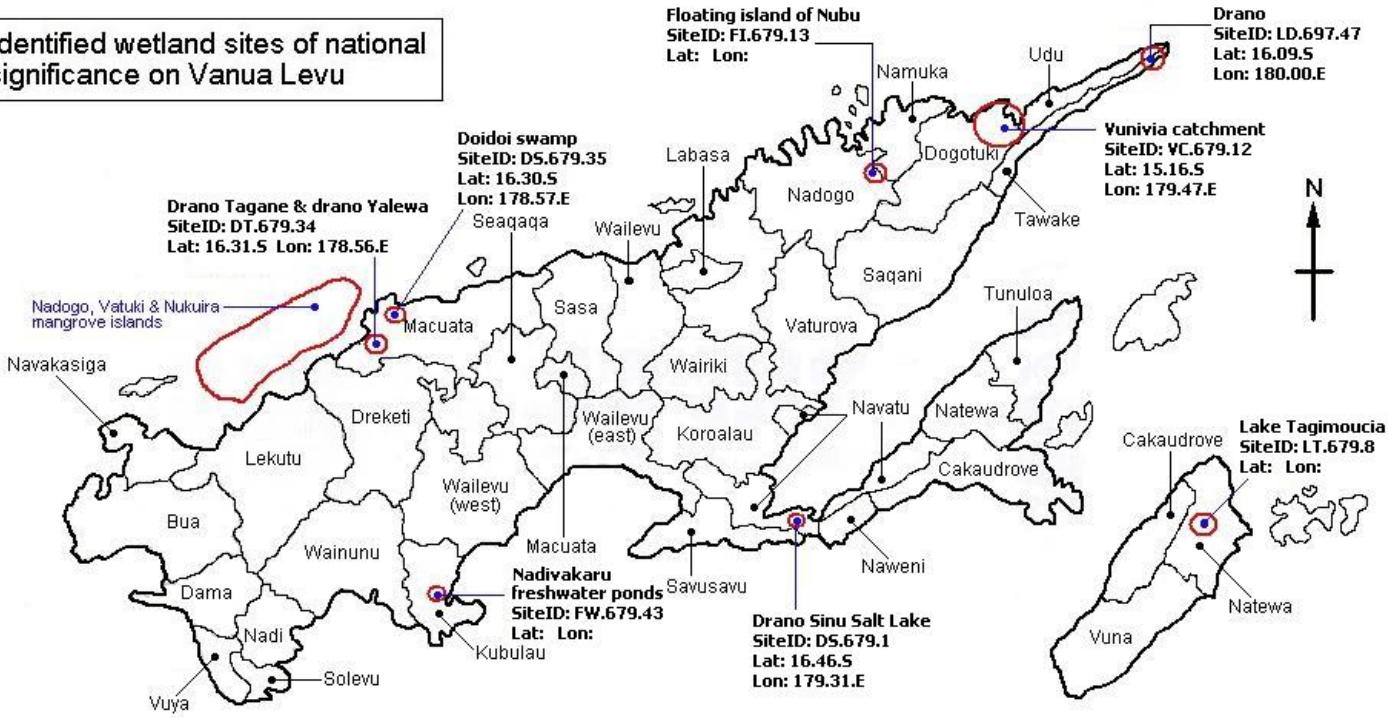
Stamps

Jenkins, A.P. and Bennett G. 2007. Freshwater gobies of Fiji. January release by Post Fiji.

Jenkins, A.P. and Bennett G. 2006. Anemonefishes of Fiji. November release by Post Fiji.

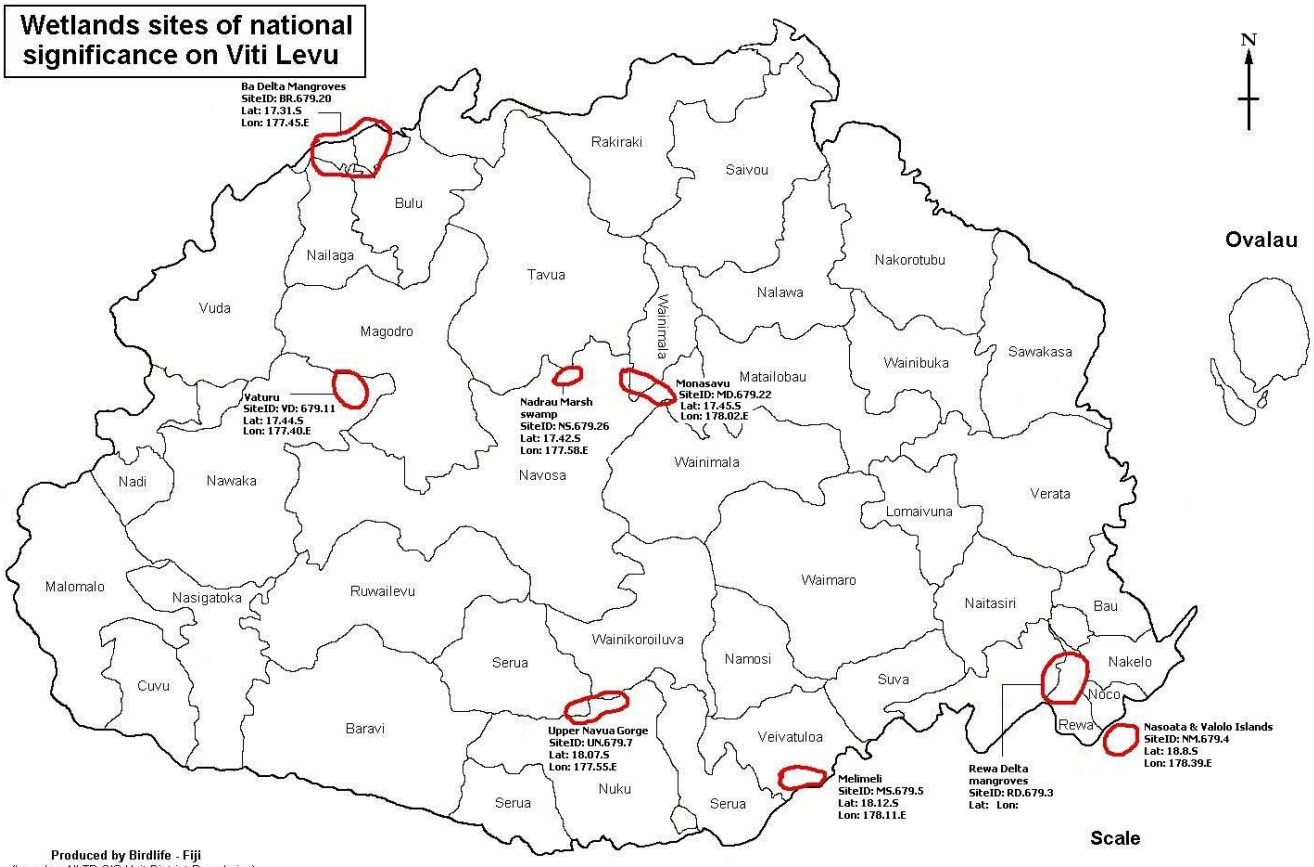
Jenkins, A.P. and Bennett G. 2002. Freshwater fishes of Fiji. April release by Post Fiji

Identified wetland sites of national significance on Vanua Levu



Produced by Birdlife - Fiji
(based on NLTB GIS Unit District Boundaries)

Wetlands sites of national significance on Viti Levu



Produced by Birdlife - Fiji
(based on NLTB GIS Unit District Boundaries)

List of Wetlands of National Significance

SiteID	Wetland Name	SiteID	Wetland Name
BM.679.10	Bilo / Muaivuso Mangrove	MF.679.15	Muanikau Foreshore
BR.679.20	Ba River Delta & Mangroves	MK.679.6	Mount Koroyanitu Range
BS.679.24	Bonatoa Swamp	MM.679.44	Muanicula Mash
BS.679.39	Balawa Swamp	MS.679.30	Moturiki Swamp
BV.679.19	Bai ni Vualiku	MS.679.5	Melimeli Swamp
DL.679.45	Delaimoala Lake	NB.679.25	Mangroves of Nadi Bay
DR.679.32	Dranoubaba River	NLL.679.41	Navesiwaka Lake
DS.679.1	Drano Sinu Salt Lake	NM.679.4	Nasoata mangrove Islet (and adjacent
DS.679.35	Doidoi Swamp	NS.679.26	Nadrau Swamp
DT.679.34	Drano Tagane & Drano Yalewa	NS.679.33	Nairirileka Swamp
FB.679.17	Fulaga Bay of Islands	PD.679.38	Ponds along Dreketi River
FI.679.13	Floating Island of Nubu	RD.679.3	Rewa Delta Mangroves
FW.679.43	Freshwater pond Nadivakarua	RR.679.16	Rewa River Watershed
GA.679.9	The Great Astrolabe Reef	SM.679.21	Saweni Mangroves
GS.679.40	Gasauva Salt Lagoon	TL.679.46	Tuvuca Lakes
KF.679.2	Kuta Freshwater Lakes of Vanua Levu	TP.679.37	Taketakelo Pond
LD.679.27	Labasa Delta Mangroves	UD.679.36	Upper Dreketi River Swamp
LD.679.47	Lake Drano	UN.679.7	Upper Navua Conservation Area
LN.679.18	Lokia-Naulu Swamp	VC.679.12	Vunivia Catchment Area
LR.679.31	Lake Rovurovu	VD.679.11	Vaturu Dam
LS.679.42	Lake on Sogatiri River	VP.679.29	Vatulele Pools
LT.679.8	Lake Taginoucia and surrounding swamp	VS.679.14	Vuaguava Salt Lake (Kabara, Lau)
MD.679.22	Monasavu Dam	VS.679.23	Vunimoli Swamp
		WP.679.28	Waidradra Palms

Site Descriptions

Bilo / Muaivuso Mangrove

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: It is surrounded by freehold land, but more information has to be gathered.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Ba River Delta & Mangroves

Wetland Type: Marine/Coastal Wetlands

Latitude: 17°31'S

Longitude: 177°45'E

Country: Fiji

General Location of the Site: In the delta of the Ba River near Ba, on the northwest coast of Viti Levu.

Elevation (m): Sea level

AreaSize (ha): 3995

General Overview of the Site: A large area of deltaic mangrove forest and hyper saline mudflats in the delta of the Ba.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
√		√				√		

Physical Features of the Site: The delta of the Ba River contains the largest contiguous stand of mangroves in Fiji. The more elevated and less well-drained portions of the delta are hyper saline because of the high evaporation rates and low rainfall. These areas are either bare mudflats or covered in stunted mangrove forest. The water catchment of the Ba River is approximately 940 sq.km or about 10% of the area of Viti Levu, all of it in the dry, leeward zone. The total volume of water discharged is estimated at 1,636 million cubic meters per year.

The delta receives an average annual rainfall of 1,905 mm and experiences a pronounced dry season.

Physical Features of the Catchment Area: No information

Hydrological Values: The Ba Delta mangroves sustain one of the most important offshore fisheries in Fiji.

General Ecological Features: Watling (1985) recognizes two main mangrove communities; one dominated by *Rhizophora stylosa* and *R. samoensis* (62% of the total), and the other dominated by the hybrid *Rhizophora x selala* (31% of the total). In the first community, *R. sylosa* forms an almost pure closed shrub forest on the extensive less well-drained flats behind the banks of the rivers and creeks. The least well-drained areas, often surrounding or adjacent to hypersaline mudflats, are stunted with a canopy height of less than 2 m. Elsewhere, the canopy height increases to 5 m. In some localities, *R. sylosa* is mixed with and occasionally replaced by *R. samoensis*, while in other localities, *R. x selala* appears and can dominate. Along or near the main river bank in upstream locations, *R. samoensis* dominates, occasionally forming pure stands with a canopy height of 5-7 m,but

more frequently occurring in mixed open forest with some *R. sylosa* and *R. x selala*. Landward species such as *Excoecaria agallocha* and *Heritiera littoralis* appear as the mangrove merges into terrestrial forest dominated by the Rain Tree *Samanea saman* on poorly drained soils. The second community comprises an open forest dominated by the *selala* hybrid. This is found to varying extents along almost all banks of rivers and streams and on associated levees. *Bruguiera gymnorrhiza* and *Xylocarpus granatum* occur infrequently with either *R sylosa* or *R. samoensis*. The canopy is very uneven and varies between 6 and 12 m in height.

Noteworthy Flora: The Ba Delta supports the largest contiguous stand of mangroves in Fiji.

Noteworthy Fauna: No information

Social and Cultural Values: No information is available specifically for this site.

Land Ownership / Tenure: State (Crown Land).

Land Uses: The principal activity in the delta is fishing. The customary fishing rights for the entire delta are held by the residents of Votua village. Inhabitants of other villages in the area make extensive use of a variety of forest products. There is, however, no legal commercial wood production in the delta (Watling, 1985).

Factors affecting the site's ecological values: The major threats are reclamation for agriculture and aquaculture. In the early 1970s, some 308 ha of mangroves were cleared and polderized at Raviravi, and half of this was intended for aquaculture, especially the culture of penaeid prawns. According to Lal (1984b), two reclamation projects for agriculture, involving 95 ha of mangroves, were approved between 1980 and 1984. In all, an estimated 541 ha of mangroves have been reclaimed for agriculture and aquaculture and a further two ha for industrial development. Illegal cutting of timber takes place, and in some areas this illegal felling is causing severe damage to the forest (Watling, 1985).

Conservation Measure Taken: All mangroves in Fiji were designated as Reserved Forests and managed by the Forest Department from 1933 to 1975. These Reserved Forests were denotified in 1975, and the mangroves have since been under the jurisdiction of the Department of Lands and Survey as an integral part of the foreshore. There are some restrictions on cutting, but traditional exploitation is still permitted.

Conservation Measures Proposed: Watling (1985) makes some recommendations for management.

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: Department of Lands and Survey.

References Cited: Lal (1984b); Watling (1985).

Bonatoa Swamp

Wetland Type: Marine/Coastal Wetlands

Latitude: 18°04'S

Longitude: 178°33'E

Country: Fiji

General Location of the Site: In the Rewa Delta, approximately 4 km south of Nausori, Viti Levu.

Elevation (m): Sea level.

AreaSize (ha): 870

General Overview of the Site: A peat swamp.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
√								

Physical Features of the Site: Bonatoa Swamp is the largest peat swamp in Fiji and provides a good example of zoned vegetation due to soil differences. The wetland is bordered by low hills and the levees of the Rewa and its anabranch in the west, by the Toga River to the north and east, and by beach ridges to the south. The soils are well-drained sandy loams, poorly drained gley clay loams and peat.

The region has a Wet Eastern climate with a dry season rainfall of 1,200-1,600 mm and a wet season rainfall of 2,000-2,400 mm.

Physical Features of the Catchment Area: No information

Hydrological Values: No information.

General Ecological Features: Where the peat is more than one metre deep, *Pandanus pynformis*, ferns and patches of *Sphagnum cuspidatum* are common. The inner colluvium peat zone is herbaceous with sedges, grasses and dicotyledonous herbs. This passes abruptly into a zone of trees, shrubs and grasses.

Noteworthy Flora: Unknown.

Noteworthy Fauna: Unknown.

Social and Cultural Values: There are several interesting examples of ring ditch fortifications on raised areas around the swamp, and one site, Nakasi, on an island within the limits of the swamp (Parry, 1977).

Land Ownership / Tenure: Native land.

Land Uses: Grazing by domestic livestock.

Factors affecting the site's ecological values: Approximately 11% of the swamp has been drained for agriculture. The swamp vegetation is occasionally burned to improve the grazing for domestic livestock.

Conservation Measures Taken: None.

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: The National Trust for Fiji is involved in the management of the site as an area of outstanding natural beauty and cultural significance.

References Cited: Ash & Ash (1984); Parry (1977).

Balawa Swamp

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°14'S

Longitude: 179°46'E

Country: Fiji

General Location: near the mouth of the Nasuvu River, on the northeast coast of Vanua Levu.

Elevation (m): Sea level.

AreaSize (ha): 100

General Overview of the Site: Brackish swamp.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native reserve.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Bai ni Vualiku

Wetland Type: Not Available

Latitude:

Longitude

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site A group of mangrove islands stretching along the northern coast of Vanua Levu about 3 -5 kilometers from land

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Delaimoala Lake

Wetland Type: Not Available

Latitude: 18°36'S

Longitude: 179°54'E

Country: Fiji

General Location: on the island of Moala, in the Moala Group.

Elevation (m): Unknown.

AreaSize (ha): 0

General Overview of the Site: A small freshwater lake on Delaimoala Peak, with matted sedges and a reed fringe (Dahl, 1986).

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Dranoubaba River

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information.

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Drano Sinu Salt Lake

Wetland Type: Marine/Coastal Wetlands

Latitude: 16.46'S

Longitude: 179.31'E

Country: Fiji

General Location: In the narrow isthmus south of Natewa Bay, 19 km east of Savusavu, Vanua Levu

Elevation (m): Sea Level

AreaSize (ha): 150

General Overview of the Site: A salt lake recommended for protection (Dahl 1986, TCSP 1990)

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
			√					

Physical Features of the Site The lake is set in a small basin with mountains surrounding the basin. The elevation of the lake and the river must be at sea level. Mangroves surround the lake on all edges extending to about 10 to 15 meters forming a belt on the lake shoreline. There is a small mangrove inland in the middle of the lake, approximately 20-30 meters in length. Mud at mangroves is black and silty. There is a small island in the middle of the lake. According to our guide, sea snakes are plentiful on this island. The island is well vegetated with littoral type vegetation. A swamp area surrounds the lake. This is vegetated by typical back-swamp vegetation (*veiborete*). Was once planted with rice. Drains were used to drain water from the swamp. These drains, during rainy weather carry muddy water to the lake.

Physical Features of the Catchment Area: No information

Hydrological Values: The water level within the lake fluctuates between high and low tide. The water recedes about 5 to 10 meters fro shoreline at low tide. There are a few freshwater creeks that also lead into the lake but there are very small. Maximum depth of the lake is about 10 meters (pers comm TK). Tides surges in at the incoming ride. During low tide the fringes of the lake area are submerged. People mostly fish during low tide.

General Ecological: Plants found within the mangroves on the edge of the lake included troe mangroves and mangrove associates. On the inland edge from the mangrove species were found. Swampy areas with different vegetation were also observed on the northern edges of the lake. Diverse range of marine species is found in the lake. People from nearby areas fish from the lake. (Pers. Comm)

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: Unique fishing area for people. Has a lot of cultural significance as outlined below. Drano sinu named after the traditional land owning unit. Fishing in the lake is usually by the women of the traditional land - owning clan, Sinu. Women speak the local dialect when they fish, the belief being that doing otherwise will reault in "qio bulubulu" called "ai sokula" baby sharks bothering you. Apart from this urinating while in the lake was not allowed. A fish "deu" like cucu spawns in the lake and colonised the coastal area when they come out. Come out in swarms of hundreds around September to November, usually around for 2 to 3 months. If people do not look after it, vakasausataki. The fish disappears. In 1999 was around from September-November. Kaikoso: Traditional ancestors from Verata. Thus the high presence of the andara. The first Tui Cakau was supposed to have come through this lake. History of the place is with Mr. Matararaba, Fiji Museaum. We were given consent by the Mataqali head to get the information from the museum. When the Tui Cakau wanted to eat kaikoso his kaikoso was fised from here.

Land Ownership / Tenure: The salt lake is co-owned by the two Yavusa of Navadra and Nukuloa from the villages of Viani and Nasinu, in the District of Navatu in the Province of Cakaudrove. But the land areas surrounding the lake are mostly Free Hold and owned by individual land owners.

Land Uses: Area immediately surrounding the lake belongs to several owners (Freehold & Native land). There is no control or management over fishing activities in the lake.

Factors affecting the site's ecological values: Mode of land tenureship and different users of area immediately surrounding the lake. There is no control or management over fishing activities in the lake.

Conservation Measures Taken: There have been no conservation measures taken although it has been proposed by the Department of Fisheries

Conservation Measures Proposed: No management attempts in place at the moment although the clan leader and others questioned were very keen on the idea of management/resource protection for the lake and its

resources. The Roko Veivuke Cakaudrove (Jonati) has written a submission to the FAB Suva, seeking support in the management of the lake. The provicincial office has recognised the need for management and has written a submission for its protection.

Existing scientific research with references: None

Current communication / public education programs: None

Current recreation / tourism: There are some tourist activities including visitors coming to the lake. But there are no structured or formalised tourist tours implemented which would benefit the mataqali Sinu from the yavusa Navadra and those from the yavusa Nukuloa who the owners of the lake.

Management Authority: None in place yet

References Cited: No information

Doidoi Swamp

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°30'S

Longitude: 178°57'E

Country: Fiji

General Location: northeast of Navidamu on the north coast of Vanua Levu.

Elevation (m): 50 m

AreaSize (ha): 100

General Overview of the Site: Freshwater swamp.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land, plus 10% freehold.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with referenced: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Drano Tagane & Drano Yalewa

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°31'S

Longitude: 178°56'E

Country: Fiji

General Location: in the hills near Navidamu on the north coast of Vanua Levu.

Elevation (m): 100

AreaSize (ha): 5

General Overview of the Site: Two small freshwater lakes.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with referenced: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Fulaga Bay of Islands

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Ramsar Criteria for Inclusion

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Floating Island of Nubu

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Freshwater pond Nadivakarua

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha):0

General Overview of the Site: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

The Great Astrolabe Reef

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Gasauva Salt Lagoon

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°10'S

Longitude: 179°59'E

Country: Fiji

General Location: near the extreme northeastern tip of Vanua Levu.

Elevation (m): Sea level.

AreaSize (ha): 150

General Overview of the Site: Salt Water Lake.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership /Tenure: Native reserve.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Kuta Freshwater Lakes of Vanua Levu

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownerships / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Labasa Delta Mangroves

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°26'S

Longitude: 179°25'E

Country: Fiji

General Location: No information

Elevation (m): Sea level.

AreaSize (ha): 1473

General Overview of the Site: A large area of deltaic mangrove swamps on the north coast of Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Physical Features of the Site: The Labasa Delta is the combined alluvial fans of three rivers, the Labasa, Qawa and Wailevu, which drain the fertile Labasa plains and adjacent foothills. The combined annual discharge of the rivers is estimated at about 1,063 million cubic metres. Mangrove forest covers much of the delta. The seasonal dry climate has resulted in the formation of hypersaline mudflats with adjacent stunted mangroves in the less well-drained areas. The Labasa Delta lies in the leeward dry zone of Vanua Levu, receiving a mean annual rainfall of 2,309 mm and experiencing a distinct dry season.

Physical Features of the Catchment Areas: No information

Hydrological Values: Major reclamation has occurred in the Labasa mangroves. Large areas of mangrove were lost as a result of the construction of three sea walls by the Colonial Sugar Refining Company between 1896 and 1904. Watling has estimated that about 650 ha of mangroves were lost at this time, but Lal (1990) puts the figure at 2,334 ha, while Baines (1979) gives a figure of 2,713 ha. In recent years, 145 ha of mangroves have been reclaimed for agricultural development, 30 ha for industrial development, and 0.2 ha for a rubbish dump. Twenty-four ha of mangroves have been converted into sewerage oxidation ponds. Pollution is also a problem in the delta, as effluents from Labasa Town and the Fiji Sugar Company Mill are discharged into the rivers at the head of the delta. Fish kills as a result of mill discharge are of almost annual occurrence (Watling, 1985).

General Ecologcial Features: Watling (1985) recognizes two main mangrove communities. A closed shrub forest occurs well behind the river banks and seaward edge, generally with hypersaline mudflats at its centre. *Rhizophora samoensis* dominates the association, forming pure stands towards the centre. *Bruguiera gymnorrhiza* and the hybrid *Rhizophora x selala* become increasingly common towards the outer edge. The canopy height declines from 5-8 m at the periphery to 1-2.5 m near the mudflats. This mangrove community comprises approximately 25.9% of the mangroves in the delta. The other community (comprising about 68.6%) is dominated by *Bruguiera gymnorrhiza* which in many areas forms pure stands with a canopy at 10-15 m. *R x selala* and *R. samoensis*, either separately or combined, form a distinct, vigorous association of limited extent along the banks of rivers and creeks. *Rhizophora stylosa* forms a fringing belt along many parts of the seaward edge, but is occasionally displaced by pure *R. samoensis*. Conversely, *R. stylosa* occasionally replaces *R.*

samoensis in its more usual riverbank locations. The more landward species *Xylocarpus granatum*, *Lumnitzera littorea* and *Excoecaria agallocha* are locally common, especially at the head of the delta where there are some small pockets of typically terrestrial vegetation (Watling, 1985).

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information is available specifically for this site.

Land Ownership / Tenure: State (Crown Land).

Land Uses: Formerly the mangroves were used for fuelwood by a cane crushing mill and bakeries in Labasa. This practice declined in the 1950s, and there is no longer any commercial extraction of fuelwood. The principal activity in the delta at present is fishing. The customary fishing rights east of the Wailevu River are owned by the Vanua of Labasa, while those west of the Wailevu are owned by the Vanua of Wailevu. Labasa Town is a major fish supply centre, with much of the produce from the Labasa Delta being retailed in Viti Levu (Watling, 1985).

Factors affecting the site's ecological values: Major reclamation has occurred in the Labasa mangroves. Large areas of mangrove were lost as a result of the construction of three sea walls by the Colonial Sugar Refining Company between 1896 and 1904. Watling has estimated that about 650 ha of mangroves were lost at this time, but Lal (1990) puts the figure at 2,334 ha, while Baines (1979) gives a figure of 2,713 ha. In recent years, 145 ha of mangroves have been reclaimed for agricultural development, 30 ha for industrial development, and 0.2 ha for a rubbish dump. Twenty-four ha of mangroves have been converted into sewerage oxidation ponds. Pollution is also a problem in the delta, as effluents from Labasa Town and the Fiji Sugar Company Mill are discharged into the rivers at the head of the delta. Fish kills as a result of mill discharge are of almost annual occurrence (Watling, 1985).

Conservation Measures Taken: All mangroves in Fiji were designated as Reserved Forests and managed by the Forest Department from 1933 to 1975. These Reserved Forests were denotified in 1975, and the mangroves have since been under the jurisdiction of the Department of Lands and Survey as an integral part of the foreshore. There are some restrictions on cutting, but traditional exploitation is still permitted.

Conservation Measures Proposed: Watling (1985) has made some recommendations for management.

Existing scientific research with references: No information

Current communication / public education: No information

Current recreation / tourism: No information

Management Authority: The mangrove areas are under the jurisdiction of the Department of Lands and Survey.

References Cited: Baines (1979); Lal (1990); Watling (1985).

Lake Drano

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°09'S

Longitude: 180°00'E

Country: Fiji

General Location: near the extreme northeastern tip of Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea level.

AreaSize (ha): 5

General Overview of the Site: Brackish lake.

Physical Features of the Site: No information

Physical Features of the Catchment Area: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership \Tenure: Native reserve.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Lokia-Naulu Swamp

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership \ Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Lake Rovurovu

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°44'S,

Longitude: 178°40'E

Country: Fiji

General Location: near the west end of Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): 50

AreaSize (ha): 0

General Overview of the Site: Freshwater lake.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership /Tenure: Native Reserve.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Lake on Sogatiri River

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°42'S

Longitude: 179°16'E

Country: Fiji

General Location: near the mouth of the Songatiri River, east of Wailevu on the south coast of Vanua

Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea level.

AreaSize (ha): 20

General Overview of the Site: Freshwater pond.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership \ Tenure: Bordering native reserve and freehold land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Lake Taginoucia and surrounding swamp

Wetland Type: Inland Wetlands

Latitude: 16.49'S

Longitude: 179.56'W

Country: Fiji

General Location: Lake Tagimoucia is situated within Tagimoucia crater on the north eastern side of the central mountain ridge of Taveuni Island, a volcanic island located in the northeast part of Fiji. Taveuni is around 10 kilometers wide and 42 kilometers in length rising to more than 1,200 m in altitude. It is in the Province of Cakaudrove. Most of the villages are located on the gently sloping less rainy western side of the ridge. The nearest villages are Bouma to the east and Lovonivonu to the northwest. Waiyevo, the government station for the island is approximately 6 kilometers to the northwest.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m): 820

AreaSize (ha): 213

General Overview of the Site: Lake Tagimoucia is Fiji's largest natural freshwater lake. It is unique compared

to other lakes in Fiji and the South Pacific in that it has differing water chemistry, algal productivity and swamp flora including floating sedge peat islands. It is also still in its natural condition with very little disturbance. It is named after a rare flower that grows only in the vicinity of the lake.

It is a crater lake with about 16 ha of open water with the rest covered with floating aquatic vegetation. Sedges growing around the edge of the lake form a floating peat mat, which can break off forming floating islands. Alluvium and colluvium accumulate at the margins of the swamp and grade into sedge peat further from the edge. The central part of the peat swamp comprises a floating peat mat 2-3 m thick. The floating peat is dissected fissures to form a number of interlocking island enclosing several open water bodies, the largest known as Lake Tagimoucia. The lake is characterized by rapid flushing of lake and shallow water depth. On the well drained slopes which surround the swamp there is forest vegetation dominated by stunted trees, epiphytes, ferns and palms.

The fauna of the lake and swamp seems to be low in both diversity and abundance. The only aquatic vertebrates observed were the Freshwater eel *Anguilla spp*. And cane road Bufo (Southern et al. 1986). Coastal villages however report the presence of the Fiji ground frog *Playmantis vitianus* and a Pacific boa *Candoia bibroni* was found in the swamp. The almost inaccessible island in the centre of the lake wound provide an ideal breeding habitat for water birds and the scrublands probably provide habitats for fauna not represented elsewhere in Fiji which are yet to be investigated. The forests surrounding the lake are however, diverse in avifauna. Noteworthy birds observed in the area surrounding Lake Tagimoucia include the Taveuni silktail, spotted fantail, fiji shikeball, Scarlet robin subspecies, Red-brested musk parrot, all endemic to Fiji (check).

The lake and swamp are little affected by human disturbance. Sedges may have been harvested in the past but now visitors footprints are the only existing sign of human activity and form a track across the swamp. The crater is visited infrequently as it takes 5 to 8 hours walk along steep forest tracks.

The site and the surrounding forests are currently under Forest Reserve, Taveuni Forest Reserve thus no logging is permitted. Customary use of the forests surrounding the site is still permitted.

Physical Features of the Site:

Physical Features of the Catchment Areas:

Hydrological Values:

General Ecological Features: No information

Noteworthy Flora:

Noteworthy Fauna:

Social and Cultural Values:

Land Ownership \ Tenure:

Land Uses:

Factors affecting the site's ecological values:

Conservation Measures Taken:

Conservation Measures Proposed:

Existing scientific research with references:

Current communication / public education programs:

Current recreation / tourism:

Management Authority:

References Cited:

Monasavu Dam

Wetland Type: Inland Wetlands

Latitude: 17°45'S

Longitude: 178°02'E

Country: Fiji

General Location: 60 km northwest of Suva, in the headwaters of the Rewa River on the Nadrau Plateau, central highlands of Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m):

AreaSize (ha): 670

General Overview of the Site: A water storage reservoir.

Physical Features of the Site: The reservoir lies immediately upstream of the original Monosavu Falls where the Nanuku Creek drops off the edge of the Nadrau Plateau. The sides of the valley are very steep and hence the reservoir is long and narrow (18 km long but no more than one km wide). The reservoir has a volume of 142 million cubic meters, with a 625 meter head of water. The area receives approximately 3,600 mm of rainfall per year, distributed unevenly. The reservoir is on the wet side of the Monosavu catchment area.

Physical Features of the Catchment Areas: No information

Hydrological Values: The dam provides an important input into the electricity grid, with a generating capacity of 80 MW.

General Ecological Features: The catchment is covered by tropical rainforest, although most of this is forest. Dominant emergents are *Endospermum macrophyllum, Canarium sp., Parinari sp.* and *Agathis vitiensis*. The exposed pebbly shores of the reservoir are scantily covered with a native shrub, Acalypha rivularis, and a variety of reeds and sedges, notably *Cyperus brevifolius.* There is, however, no *Miscanthus*. Where the shore is muddy, the grass *Brachiaria mutica* is abundant.

Noteworthy Flora: No information

Noteworthy Fauna: No information is available on the wetland fauna. The forests of the catchment area support a varied bird life.

Social and Cultural Values: The reservoir supplies the local population with fish (tilapia), and is a popular recreation area.

Land Ownership \ Tenure: Native land and Fiji Electricity Authority.

Land Uses: Generation of hydro-electric power, fishing and some recreation.

Factors affecting the site's ecological values: None known.

Conservation Measures Taken: None

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: Native land owners and the Fiji Electricity Board.

References Cited: Brodie (1984); Brodie & Gibbons (1986); Brodie et al. (1987); Gibbons (1985); Institute of Natural Resources (undated); Raj et al. (1977).

Muanikau Foreshore

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership \ Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Mount Koroyanitu Range

Wetland Type: Inland Wetlands

Latitude: 177.40' E

Longitude: 17.40' S

Country: Fiji

General Location: The Koroyanitu range is located in the dry western zone of Viti Levu between Nadi and Lautoka

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
√				√	√			

Elevation (m): 1195

AreaSize (ha): 2984

General Overview of the Site: Scenically, the area is spectacular with waterfalls, towering cliffs of lava, and luxuriant forest growth. Within the range, the Sabeto, Teidamu, Varaciva and Veitogo Rivers gather their headwaters.

Physical Features of the Site: The Koroyanitu range devides the Nadi and Ba river catchments. It raises to a high point of 1,195 m (3921') at Mt.Koroyanitu, which is the fourth highest peak in Fiji. It raises sharply from the surrounding landscape forming steep slopes and precipitous cliff faces and waterfalls. In the context of Fiji, the

Koroyanitu landforms are quite unique and suitable for educational purposes. The range is formed mainly from undifferentiated andesitic lava flows and pyroclasts in combination with younger undifferentiated flows of olivine basalt. The Mount Koroyanitu range, is about two to five million years old. The range itself was a volcanic center from this time, accounting for its rugged appearance today. Along the top of the range to the windward side, the parent material has produced nigrescent soil, a shallow black soil rich in nutrients. The steep flanks are characterised by humid latosols formed from basic to intermediate parent materials which tends to be low in fertility. Cloud cover over Koroyanitu is "low". An average of 4 to 5 hours of sunshine per day is likely to be experienced in the CA. The average rainfall at the top of the range is 500cm per year, the higher slopes receive 250cm and the lower slopes receive 175 to 200cm annually. There is 5 months of dry season from May to September.

Physical Features of the Catchment Areas: No information

Hydrological Values: The area comprises the upper catchments of Sabeto, Vitogo, Varaqe, Teidamu, Varaciva and Nadrou river systems. In the past, the area was important catchment of water supply to Lautoka. With the construction of the Vaturu dam, its status changed. While the water resource is not severely threatened at present, the situation can become critical if population pressure and intensive agriculture is introduced within the bounds of the upper river catchment systems. Such developments will have potential impacts on down stream activities like coastal fisheries, tourism and urban / semi-urban.

General Ecological Features: No information

Noteworthy Flora: SPREP consultants, Peter Wood and Fanaura Kingston (1995) listed the following flora to be endemic to the Koroyanitu range.

1. *Peperomia nodusa*
2. *Litsea alleniana*
3. *Elatostema greenwoodii*
4. *Melochina roseiflora*
5. *Tapeinosperma greenwoodii*
6. *Syzygium minus*
7. *Melicope evansensis*
8. *Agleia evansensis*
9. *Ixora greenwoodiana*
10. *Psychotria leptantha*
11. *Psychotria stenantha*
12. *Syzygium minus*
13. *Melicope evansensis*
14. *Agleia evansensis*
15. *Ixora greenwoodiana*
16. *Psychotria leptantha*
17. *Psychotria stenantha*

The New Zealand based Mauria Society noted the following tree species during field work in 1989. The Fijian names for the trees are in brackets.

At the highest altitudes (up to 1,195m) corresponding with the highest rainfalls, the main emergent species is *Agathis vitiensis* (Dakua makadre) with the canopy comprising *Cleistocalyx spp*. (Yasiyasi), *Ficus obliqua* (Baka), Podocarpus neriifolius (Kuasi), Storckiella vitiensis (Marasa). This forest, merges with the seral fringe forest where the main species are *Metrosideros collina* (Vuga), *Alphitonia zizyphoides* (Doi), *Trichospermum spp.* (Mako), and *Macarangra harveyana* (Godoa) with poles of *Agathis vitiensis* (Dakua makadre)

In 1994, an extensive biodiversity survey of the Koroyanitu forests were undertaken by USP/Earthwatch/FPL/Forestry. Some 600 plant and animal species were identified, over 50% of which were of cultural use/significance to the Koroyanitu community [Thaman R. Baba J. 1994]

Noteworthy Fauna: The forest obligate species included the followings;

ENDEMIC SPECIES

1. Giant forest honeyeater (*Gymnomyze viridis*)
2. Fiji water warbler (*Vitia ruficapilla)*

3. Yellow breasted musk parrot (*Prosepeia personata)*
4. Golden dove (*Ptilinopus victor*)
5. Barking pigeon (*Ducula latrans*)

ENDEMIC RACES

1. Fiji Shrikebill (*Clytorhynchus vitiensis*)
2. Polynesion starling (*Aplonis tabuensis*)
3. Golden whistler *(Pachycephala Pectoralis)*

The non-obligate forest species includes the following;

ENDEMIC SPECIES

1. Slaty flycatcher (*Mayrornis lesson)*
2. Woodswallow (*Artamus mentalis)*

ENDEMIC RACES

1. Wattled honey eater (*Foulehio carunculata)*
2. Red headed parrot finch (*Erythrura kleinschmidti)*
3. White throated pegion (*Columba vitiensis*)
4. Fan tailed cuckoo (*Cacomantis pyrrophanus)*
5. Polynesian triller *(Lalage maculosa)*

Social and Cultural Values: Culturally the area has a high significance with an abundance of archaeological sites and cultural landscapes throughout the area and strong cultural association with the people who live there.

Land Ownership \ Tenure: Land tenure/ownership of Apart from 129 hectares of crown schedule A land, all of the CA at Koroyanitu is native land belonging to some 24 landowning units or mataqali who represent some 37 extended family units or tokatoka. Over 1,300 ha or approximately 50% of the core CA is owned jointly by 4 mataqali from the villages of Abaca, Nalotawa, Navilawa and Vakabuli.

The four mataqali are listed below with the area of land they own within the CA.

1. Mataqali "Natuwai" of Abaca village owns 389 ha in the CA.

2. Mataqali "Naisoro" of Navilawa village owns 303 ha in the CA.

3. Mataqali "Navunidamanu" of Nalotawa village owns 312 ha in the CA.

4. Mataqali "Cawanisa" of Vakabuli village owns 305 ha in the CA.

The 4 villages own 2,367 ha or approximately 83% of the core. CA and the distribution of land ownership on village basis is listed below;

1. Vakabuli Village owns 813 ha (28.5%)
2. Abaca Village owns 651 ha (22.9%)
3. Navilawa Village owns 591 ha (20.7%)
4. Nalotawa Village owns 312 ha (11%)
5. Naboutini Village owns 175 ha (6.1%)
6. Vitogo Village owns 112 ha (3.9%)
7. Yaloku Village owns 29 ha (1%)
8. Nailaga Village owns 17.4 ha (0.4%)
9. Koroiwaca Village owns 13 ha (0.5%)
10. Korobebe Village owns 4 ha (0.1%)

The Government holds 129 ha (4.5%).

Above figures was obtained from the "Koroyanitu National Park Project. Preparation Documents" of May 1995 and they do not add up if calculated.

Land Uses: There is no formal agricultural activity in the core conservation area (CA) although the area is used as the source of non-timber products such as traditional medicine and construction materials for village use.

Most of the area is under native forest cover, with a very small area of exotic pine plantation at the northern end.

An experimental agricultural plot has been established within phase one of the Koroyanitu Park project. It is located on an area of grassland above the Varaqe and Tunutunu creeks, with the view of determining the agricultural potential of such "talasiga" lands, and to encourage the landowners to utilise this lands as opposed to further clearing of native forests for cultivation purposes.

The villagers depend on the land for food, medicine and building resources.

Factors affecting the site's ecological values: No information

Conservation Measures Taken: FPL have been very successful in reducing unnecessary burning at Koroyanitu and aim to introduce fire prevention messages into the overall park interpretation programmes.

Conservation Measures Proposed: NLTB / SPREP New Zealand ODA funded.

Existing scientific research with references: SPREP / NLTB

Current communication / public education programs: USP - Randy Thaman NLTB / SPREP

Current recreation / tourism: Eco-tourism venture

Management Authority: SPREP / NLTB

References Cited: No information

Muanicula Mash

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°53'S

Longitude: 178°55'E

Country: Fiji

General Location: 16°53'S, 178°55'E; at the mouth of the Wainunu River southeast of Dada, on the South coast of Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea level.

AreaSize (ha): 0

General Overview of theSite: Saltmarsh.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Freehold land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Moturiki Swamp

Wetland Type: Marine/Coastal Wetlands

Latitude: 17°46'S

Longitude: 178°45'E

Country: Fiji

General Location: on the small island of Moturiki, off the southwest coast of Ovalau Island in the Lomaiviti Group.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Near sea level.

AreaSize (ha): 0

General Overview of the Site: An area of freshwater swamp forest and bog on the small volcanic high island of Moturiki (10 sq.km). Identified as an ecosystem of conservation interest and recommended for protection by Dahl (1980 & 1986) and TCSP (1990).

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Melimeli Swamp

Wetland Type: Marine/Coastal Wetlands

Latitude: 18 12'S

Longitude: 178 11'E

Country: Fiji

General Location: It is located about 3 km Northeast of Navua Town, Namosi, Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m): Sea Level

AreaSize (ha): 507

General Overview of the Site: This is a freshwater wetland, the second largest peat swamp in Fiji

Physical Features of the Site: The swamp is surrounded by hills to the northeast, by coastal and estuarine mangroves to the east and by levees of the former tributaries to the Navua River. Soil beneath the peat tend to be fine textured alluvium to the north and west and coarser coastal deposits tend to be common towards the southeast. The maximum depth of the peat is about 2m. Brackish salt water tends to extend 50 - 100m inland from the mangroves. Rainfall during the rainy season ranges from 2000 - 2400mm. During the dry season, it ranges from 1200 - 1600mm.

Physical Features of the Catchment Areas: No information

Hydrological Values: The main one tends to be Groundwater Recharge and Flood Control. When considering the fringing mangroves then Sediment Trapping and Shoreline Stabilization tend to be of importance also.

General Ecological Features: Previous studies show that vegetation types tend to vary a lot. For example;

* Peat - vegetation tend to be dominated by the fern *Dicranopteris linearis* and the sedges *Scleria polycarpa* and *Eleocharis dulcis*.
* Deeper peat - vegetation is dominated by patches of *Pandanus pyriformis*, and some shrubs like *Fagraea berteriana*, *Glochidion cordatum* and *Melastoma denticulatum.*
* Saline grey soils - *Eleocharis dulcis, E. ochrostachys, Nephrolepis biserrata, Spaerostephanos unitus, Acrostichum aureum, Pandanus pyriformis.*

Noteworthy Flora: Some noteworthy flora within this area would be;

* *Eleocharis spp. (*Kuta), endangered species, cultural/traditional values.
* *Fagraea berteroana* (Bua ni Viti), indigenous, cultural/traditional values.
* *Pandanus pyriformis* (Vadra), endemic

Noteworthy Fauna: *Anguilla spp*., etc (not enough data found)

Social and Cultural Values: Fisheries production. There are several ring ditch fortification sites. Also present are abandoned old garden sites

Land Ownership / Tenure: Part of it is Native Land and the other part is Freehold of which Ross Estate owns a large portion

Land Uses: Some parts are being drained for agriculture

Factors affecting the site's ecological values: Deforestation of the surrounding forests to the north, Agricultural development and expending Queen's Road Highway

Conservation Measures Taken: None

Conservation Measures Proposed: None. Peat swamps of the Navua Delta have been identified as sites of conservation interest meriting special protection (Dahl 1980, 1968)

Existing scientific research with references: None

Current communication / public education programs: None

Current recreation / tourism: None

Management Authority: None

References Cited: Gray, A.J. Fiji Wetlands in Scott, D.A. (edt.), 1993, A Directory of Wetlands in Oceania. International Waterfowl and Wetlands Research Bureau (IWRB), Slimdridge, United Kingdom.: 83-84

Mangroves of Nadi Bay

Wetland Type: Marine/Coastal Wetlands

Latitude: 17°41'S

Longitude: 177°29'E

Country: Fiji

General Location: between Yako and Nacilau Point on the west coast of Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m): Sea level

AreaSize (ha): 3068

General Overview of the Site: Extensive mangrove formations in the deltas of the Nadi, Sabeto and Vitogos Rivers, and stands of fringing mangroves along the intervening coasts.

Physical Features of the Site: The Nadi Bay mangroves, as described by Watling (1986), extend for about 70 km along the coast from the headland north of Yako village in the south to Nacilau Point in the north. The small offshore islands of Yakuilau (20 ha), Via (2 ha), Bekana (20 ha) and Yawalau (2 ha) are included. Three substantial rivers flow into the sea at the site, the Nadi, Sabeto and Vitogo. The protected situation of the coastline has resulted in the retention of alluvial sediments allowing the formation of extensive mangrove-dominated deltas at the mouths of all three rivers and the formation of extensive fringing mangroves, especially along the coast between Vuda Point and Lautoka. Hypersaline flats are a characteristic feature of the site; they are formed as a consequence of the very high evaporation rates during the severe dry season. The hinterland is an extensive alluvial plain. The site lies in Viti Levu's dry climatic zone and experiences strongly seasonal annual rainfall averaging 1,650 mm. Situated in a protected bay on Viti Levu's leeward coast, the site is sheltered from the Southeast Trades. However, it is exposed to cyclones which normally arrive from the northwest.

Physical Features of the Catchment Areas: No information

Hydrological Values: The mangroves help sustain the inshore fisheries of Nadi Bay which is very intensively fished. They also play an important role in coastal protection, particularly by dampening the effects of cyclones and storm surges.

General Ecological Features: Two principal mangrove communities have been identified: a closed shrub forest overwhelmingly dominated by *Rhizophora stylosa* (29% of the mangroves), and an open forest dominated by the hybrid *Rhizophora x selala* (71% of the mangroves). In the closed shrub forest, the canopy height varies from 2-4 m at the seaward edge to 5-7 m in the most vigorous stands. In poorly drained areas, stunted stands of *R. stylosa* down to 1 m in height occur alongside hypersaline mudflats. *Rhizophora samoensis* is associated with fine, soft sediments and fresh water, and is dominant along some creeks. In the open forest dominated by *R. x selala*, the canopy is uneven, varying between 4 m and 12 m. *R. samoensis* occurs commonly in these forests, and there is also some *Bruguiera gymnorrhiza*. In the more elevated areas, species such as *Xylocarpus granatum, Excoecaria agallocha, Scaevola taccada* and *Hibiscus tiliaceus* appear. In the Nadi and Sabeto deltas, extensive levees have been formed. Some of these are of considerable size and have been cultivated; others have a typically terrestrial flora with *Cocos nucifera, Leucaena leucocephala, Morinda citrifolia, Tamarindus indica, Cordia subcordata, Thespesia populnea, Calophyllum inophyllum,Samanea saman and Xylocarpus moluccensis* (Watling, 1986).

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information is available specifically for this site.

Land Ownership / Tenure: State (Crown Land).

Land Uses: Formerly the mangroves were used for fuelwood by light industry and bakeries in Nadi and Lautoka, and especially by the Cane Crushing Mill at Lautoka. This practice declined in the 1950s, and today there are no mangrove fuelwood concessions for industrial purposes. However, the mangroves continue to be heavily utilised for domestic fuelwood. Between 1983 and 1986, 23 Mangrove Cutting Licenses were issued by the Divisional Forestry Office Western for domestic fuelwood. All licensed sites were in remnant mangroves behind recently

rehabilitated sea walls (Watling, 1986). The mangroves of Nadi Bay border on a dense rural population of small-holder cane farmers and lie in close proximity to two major urban centres; Lautoka City (population 29,000) in the north, and Nadi/Nadi Airport (population 13,000) in the south.

Factors affecting the site's ecological values: The major threats are land-fill for industrial and tourist development, and reclamation for agriculture. There is also some illegal cutting of timber. In some areas the demand for fuelwood is exceeding the sustainable yield, and mangroves are being completely removed. At the turn of the century, the Colonial Sugar Refining Company constructed sea walls at several places in the bay, but most extensively north of Lautoka on the Lovu-Drasa-Vitogo flats. Some mangrove was lost (perhaps as much as 100 ha), but the sea walls eventually fell into disrepair and mangrove recolonized the original areas. Between 1976 and 1983, the old sea walls were rehabilitated and some new sea walls were constructed. This resulted in the loss of 233 ha of mangroves. A further 366 ha of mangrove had been lost by 1986 as a result of other reclamation projects: 234 ha for four tourist developments, 109 ha for three industrial developments, 10 ha for an urban sewerage system, 6 ha for a rubbish dump, 4 ha for urban development and 3 ha for agriculture (Watling, 1986). By 1986, reclamation (either developed or approved) had accounted for approximately 600 ha of mangroves or about 15% of the original resource. According to Lal (1984b), nine reclamation projects involving 813 ha of mangroves were approved between 1980 and 1984. Most were for agricultural purposes, although the largest (493 ha) was for tourist development and fiscal industries at Sawena Beach. Hydrological and biophysical values: The mangroves help sustain the inshore fisheries of Nadi Bay which is very intensively fished. They also play an important role in coastal protection particularly by dampening the effects of cyclones and storm surges.

Conservation Measures Taken: All mangroves in Fiji were designated as Reserved Forests and managed by the Forest Department from 1933 to 1975. These Reserved Forests were denotified in 1975, and the mangroves have since been under the jurisdiction of the Department of Lands and Survey as an integral part of the foreshore. There are some restrictions on cutting, but traditional exploitation is still permitted.

Conservation Measures Proposed: Watling (1986) has prepared a management plan for the mangroves of Nadi Bay. He recommends that the mangroves north of the Waibitu Creek and in the Vitogo mangrove complex be protected as a Resource Reserve to help sustain the fisheries of Nadi Bay. The mangrove overwash island of Yawalevu should also be included in the reserve. Elsewhere, the majority of the mangroves should be zoned for traditional uses. Small areas of mangrove which help to protect the FSC railway line in exposed situations should be retained and managed for this purpose. Watling (1986) does not consider the mangroves of this area to be suitable for the large-scale production of fuelwood.

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: Nadi Bay is an important focus of the tourist industry.

Management Authority: The coastline from the north of Lautoka to the south of Vuda Point lies within the Port of Lautoka-Vuda and is under the jurisdiction of the Ports Authority of Fiji. Mangroves elsewhere are under the jurisdiction of the Department of Lands and Survey.

References Cited: Gangaiya et al. (1988); Lal (1984b); Watling (1986).

Navesiwaka Lake

Wetland Type: Inland Wetlands

Latitude: 16°25'S

Longitude: 179°40'E

Country: Fiji

General Location: in the upper drainage of the Nasuvu River in the interior of eastern Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): 500 m.

AreaSize (ha): 10

General Overview of the Site: Freshwater lake.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Nasoata mangrove Islet (and adjacent

Wetland Type: Marine/Coastal Wetlands

Latitude: 18.8.S

Longitude: 178.39.E

Country: Fiji

General Location: Nasoata Islet is within the Rewa Delta which is located within the Province of Rewa is the southeast corner of Viti Levu. The main mouth of the Rewa River is located about 3 km to the west. The nearest town is Nausori which is … km to the north and Suva the capital is … km west of the island. Approximately … villagers are located within the Rewa Delta.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
√		√	√					

Elevation (m): Sea level

AreaSize (ha): 5130

General Overview of the Site: Nasoata is a small, predominantly mangrove, island located off the mouth of the Nasoata River, within the delta of the Rewa River, Fiji's largest and longest river. The Rewa Delta hosts the largest and most diverse area of mangroves in Fiji (5,100 ha). The islet is uninhabited and in a relatively pristine condition having a relatively rich flora, avifauna, and marine biodiversity, and rich mangrove-associated crustacan fauna. It is therefore a prototype coastal mangrove side of the Rewa Delta. It is accessed by boat via the Nausori River.

The site has a total of 121 species (74% indigenous) of vascular plants, and 8 vegetation types, mainly mangroves or mangrove associated vegetation, are reported. At least 14 bird species have been sighted on the island and its surrounding mudflats and is a nationally important habitat for waders which are present in great numbers. Skinks, geckos, crustaceans, molluses and finfish also bound.

The mangroves of Nasoata Islet and adjacent mainland mangrove also contribute significntly to the socio-economic well being of coastal communities of the Rewa Delta. Over 100 villagers are dispersed throughout the

delta, comprising the largest community in Fiji that is closely associated with mangrove. Around … villagers are situated within the mangroves many still relying heavily on othe mangrove resources (forestry and fisheries products) for subsistance use and to provide income. The delta supports an artisanal fishery that supplies much of the needs of greater Suva (Gray 1993).

Physical Features of the Site: Nasoata Islet and nearby mangrove areas are sea level thus are flat areas. Soil types include the dogo series, which are soils of mangrove swamps affected by repeated flooding with brackish or saline water. These soils are very dark grey and structure less with abundant partly decomposed plant remains. They are very saline with high sulphide content. Parent material of the soils is esturine deposits from marine coastal deposits and river alluvium. The Soso series is found on elevated parts within the mangroves. They are very dark grey soils, poorly drained, saline, have a crumb structure, and have high sulphide content. On the surface they are often acidic due to the oxidation of the sulphide (Purnell 1972).

The tidal waters surrounding the island rainge from a depth of … m at the mouth of the Nasoata River to m around the island. Mean tidal range is around 0.9 m during neap tides and 1.3 m during srping tides.

The island lies just off the windward southeastern portion of Viti Levu thus has a wet, tropical oceanic climate. The area has a dry season rainfall of around 1,200-1,600 mm and a wet season rainfall of around 2,000-2,400 mm. the average annual mean tempreture is 25 degrees Celcius. The tempreture seldom rises above 32 degrees or falls below 16 degrees Celcius (Smith 1979). During the warm, wet season between mid-November and mid-April gale force winds and destructive tropical cyclones, storm waves and associated heavy rainfall are common.
High seas, reinforced by the predominant tradewinds, have led to extensive deposits of pumice (soata in Fijian_ throughout the low-lying areas of the southeastern protion of the island. This is the origin of the island's name, Nasoata (literally "the pumice" or place of the pumice) (Thaman et al 2003).

Physical Features of the Catchment Areas: No information

Hydrological Values: The Rewa River is the largest river in Fiji, having a total catchment of more than a quarter of the total area of Viti Levu, approximately 2980 square km, and a discharge of the order of 7,897 million cubic meters of water a year, transporting around 1,200 tons of sediments to the mouth of the river each year (Watling 1985). In its lower reaches of the delta there are several interconnected distributaries, the Nasoata River being one of these. The mangrove of the delta is of importance in distributing the large volumes of water from the Rewa as well as filtering out sediments.

General Ecologcial Features: The Rewa delta host the largest and most diverse mangrove system in Fiji. Nasoata and nearby mainland mangrove areas are not only a good representation of the mangrove diversity of the delta but also include examples of other wetland types such as littoral forest, intertidal mudflats, estuarine areas, and seagrass beds. Ecological and environmental services that the site provide include providing a safe habitat for juvenile and adult marine fauna, the provisions of nutrients to marine food chains through the export or organic matter, protection of inland areas and settlements from storm damage, salt spray, coastal erosion and inundation due to sea-level rise and interception of sediment and nutrient rich runoff from the land, thus maintaining water quality of inshore water. Noteworthy biodiversity features are described below in summary.

Noteworthy Flora: The mangroves of the site are good representation of those of the Rewa delta, being the most floristically and structural diverse in the country. The vegetation is largely *Rhizophora-and Bruguiera-*dominated mangrove forest, with the latter covering almost half of the island. Mixed tidal forest, periodic swamp forest, inland forest or coconut woodland, littoral forest and strand vegetation, ruderal vegetation and seagrass beds are the other vegetation types.

All the eight mangrove species found in Fiji are present at the site including outstanding stands of large dogo (*Bruguiera gymnorrhiza)* and dabi *(xyloxarpus granatum)* within the central swampy portion of the island. The sterile hybrid, *Rhizophara X selala*, known in Fijian as selala (meaning "empty flower"), is also found, but common, on the island. The hybrid is only found in New Caledonia, Fiji, and Tonga. Lumnitzora, sagale is also present but was reportedly a more dominant component of the forest in the past, prior to its logging as its wood is one of the most durable and desirable species for houseposts for Fijians houses. Also present within the small areas of mixed tidal forest are *Excoccaria agalliocha, Heritiera littoralism and Intria bijuga.* Also of interest are the epiphytic ferms, *Davaliia fijitensis, Davallia solida, Pyrrosia lancrolata, and Stenochlaena palustris*, the small epiphytic ferns, V*aginularia angustissima and Villaria elongata,* and the epiphytic orchids *Taeniophyllum fasicola* and *Pberonia balophila*. There are also significant areas of inland coconut-dominated coastal forest.

Extensive areas of seagrass beds are located on the intertidal sand-mud flats and subtidal areas off the oceanside south coast of the island. The dominant species, which are in the densest concentrations on the south, seaward edge of the intertidal flat are *Halophila ovalus, Halodule pinifolia and Halodule uninervia.* The dominant species in the deeper, sandier subtidal areas off the intertidal flats is *Syringodium isoetifolium* mid-November and mid-April gale force winds and destructive tropical cyclones, storm waves and associated heavy rainfall are common.

High seas, reinforced by the predominant tradewinds, have led to extensive deposits of pumice (soata in Fijian) throughout the low-lying areas of the southeastern portion of the island. This is the origin for the island's name Nasoata (literally "the pumice" or place of the pumice). (Thaman et al 2003).

Noteworthy Fauna: The fauna of the island and surrounding mud flats is very rich given the small size of the island. Particularly important are the rick avifauna, a range of other vertebrates, the culturally important crustacean fauna, and a range of other intertidal marine invertebrates and fish? (not surveyed yet).

Preliminary estimates indicate that there are at least 14 species of land, freshwater, shore and sea birds resident or visiting the island. Of particular interest is the abundance of the Pacific Black Duck which is commonly seen in flocks feeding or resting on mudflats, including about 60 in three flocks counted from one spot in April 2001. This was the largest number ever seen at one time in Fiji by resident bird expert Dick Watling. Also common to occasional are the Collared Kingfisher, the Wattled Honeyeater and the Vanikoro Boradbill. In terms of Fiji's shore and seabird fauna, the mudflats adjacent to the island are extensive and of major interest with respect to Nasoata's possible selection for Ramsar nomination. Over 300 waders were observed on these mudflats in April 2001, the majority of which were migratory Wandering Tattlers. Also relatively abundant were the Whimbrel and the Crested Turn.

Reptiles of interest on the island include blud-tailed and copper skinks (*Emoia cyanara and Emoia impari*), which are common, the moth skink (*Lipinia nostua*), the oceanic gecko (*Gebyra oceania*) and the mourning gecko (*Lepidodastyluz huybris*. A juvenile Pacific boa (*Candoia hibroni*), one of Fiji's two native land snakes was also seen in a coastal tree after a major flood in 2001. It has not been seen since. The only indigenous terrestrial mammal is the non-resident fruit bat (Pteropus tonganna) that visits the island to feed.

The most immediately obvious marine fauna are the economically and culturally important crastaceans that abound on the island. Most notable are the mud lobster (*Thalassina anomaia*) with its conspicuous conical mounds, the red-clawed mangrove crab (*Searma crybrodactyla*), the black mangrove crab (*Metapograpsus messor*), the larger mub crab (*Srylla serrata*), all of which are common in the main mangrove area, and the land crab (*Cardisoma carnifex*) in more well-drained sites. Commonly caught prawns or shrimps include species of *Penacus, Macrobrachium equidens and Palaemonconsinnus*. All of these species are hunted in season and sold at local markets as an important source of cash income. Commonly found mangrove-associated shellfish include mangrove oysters (*Crassostrea mordax*), nerite snails (*Nerita sp.*), periwinkles (*Littorina seabra*), sponge finger oqster (*Vulsella outsella*), mangrove mussed (*Madiolus agripotus*) and saddle tree oyster (*Isognomou ephippium*). These are mainly used for subsistence. Other species found on the mud flats include the ark shell (*Anadara antiquata)*, the venus clam *Gafarium lumidum* and a species of beche-de-mer (*Metriatyla scabra*). Noteworthy finfish commonly caught include *Upernteus vittatus, Gazza minuta, Leiognathus equulas, Lutjanus fuloiflamma, Lutjanua hobor, eleotric melanosoma, Siganus, Lethrius barak, Alamugil sabeli,* and freshwater eels (*Angailla marmorata*) (Thaman 1998). The mudskipper (*Peropbtblamus argentimaculatus)* is also common.

Social and Cultural Values:

Social Information:

The districts within the proposed are (Nasoata plus mainland) include Noco (villages Matanimoli, Nabudrau, Nacuru, Naivilaca, Nakauwaru, Nakuriwai, Naqarani, Narocake, Navaka, Taci), Dreketi (villages Nabuli, Nadoria, Nakorovou, Nalase, Vunisinu), and Rewa (Drekena, Lokia, Lomanikoro, Nabua, Nadoi, Narociva, Nasigatoka, Nasilai, Nukui, Nukutubu, Tuyavu, Vunuku) all within the Province of Rewa.

The district of Dreketi, includes Nakorovou village, the traditional guardian of Nasoata Island, Nakorovou village is about … kilometers from Nasoata. It consists of 4 mataqali (landowning units?); Naikawaqa, Wainasue (chiefly mataqali), Naqali, and Cavula. The population in 1995 was 294. (Provincial Profile Central Division). There are a few traditional houses in the village but most are made of wood with corrugated iron. Most houses have electivity (FEA), tap water, and outdoor latrines. The village has both wet and dry land within the village boundary, the wet areas used to grow via or giant arum plant whilst the dry land is used for shifting cultivation. The economy used to be subsistence based but has now shifted to modern economy with many of the villagers earning a wage or

selling fisheries for income (Overall 1993).

Other villages located close to Nasoata Island Nukui and Nadoria. Some of the villages adjacent to the site can be accessed by road while other such as Nukui can only be accessed by boat via the many rivers.

In Dreketi Tikina housing is mainly wood followed by tin and then concrete. Toilets are largely water sealed. All villages had tap water and land fills for solid waste. Main economic activities include paid employment, livestock, farming, cash cropping. Large portions still subsistence based. (Provincial Profile Central Division).

Cultural Importance:
In pre-European times, 19th century, the Rewa Delta is believed to have supported one of the most densest human population in Fiji. The population declined since then and then steadily risen since. It is still one of the most densely populated areas in the country (140.7 people per square kilometer) and is by far the largest community closely associated with mangroves in Fiji. The villages associated with Nasoata and the adjacent mangroves areas have developed over centuries a wealth of knowledge of the mangroves, their ecology, biodiversity, use as well as cultural importance.

In the past, Nasoata Island wasa source of construction materials for traditional Fijian houses. It was also used during World War II by New Zealand and American troops as a training ground for jungle combat. The island is now used almost exclusively coconut palms as a fishing ground or "breadbasket" (ikanakana) and for the production of copra from the existing coconut palms on and around the old copra estate. The nearby village communities continue to utilize the mangrove flora for products Such as firewood, construction material, medicine, dyes, fishing equipment, cordage, and many other products and harvest mangrove-associated fisheries such as mangrove include mangrove crab, mud lobster, prawns, eels, and a number of mangrove-related fish species as an important source of protein for subsistence and cash needs. More recently, for a short period, the people of Nakorovou have utilized Nasoata, as a tourist picnic destination.

The Rewa delta was also known for local warfare during the 19th century. Settlements of this period display ring-ditch type of fortification, crude but effective defense consisting of outer bank and roughly circular ditch or moat enclosing a fenced habitation area, reached by causeways. These are now abandoned by traces of 605 ring-ditch site have been identified around the delta with around 11% being in back swamp or mangrove environments (Parry 1978).

Land Ownership / Tenure:

Land and Marine Tenure:
The island was formerly a freehold property run as a copra plantation, first as the Hedstrom Estate and subsequently by a Mr. Garner and most recently by Ram Singh. In the late 1970s the title to the island was transferred to the high chief of Rewa, Ro Lady Lala Mata, the Rokotui Dreketi, with the people of nearby Nakorovou Village acting as the custodians and main users. Maraqali that own the land include … from the villages of …

The customary user right to the fishing grounds surrounding Nasoata Island belong to the vanua of … villages.

Land Uses: Current use of the site is mainly by nearby villages as a source of mangrove forestry and fisheries products. Villagers of Nakorovou village also conduct trips to the island for tourism, scientific, or educational purposes.

In the past, the delta was an important source of mangrove fuel for industrial and domestic purposes. In recent years, approximately 5,000 cubic meters of firewood has been extracted annually for domestic needs by license holders, there are currently … coups active in the delta.

Factors affecting the site's ecological values:

At the site:
Much of the coastal mangroves of the Rewa Delta including those of Nasoata Island have largely escaped human impact sue to their inaccessibility.

The island however has a number of introduced plant and animal species that have shown to have been highly invasive in other areas of Fiji. These include, the trailing daisy (*Wedelia trolabata*), which could lead to serious ecological disturbance, particularly on small offshore inlands and has the ability to out complete native species, forming almost monodonimant stands in Fiji's wetlands and on mangrove edges. Also of concern is the hooked pepper bush, *Yiper adanum*, which is present, although presently uncommon and the paragrass (*Brachiaria tititica*). In terms of mammals, the introduced mongose (*Herpestes auropunclatus*) and the jungle mynah bird, could lead to the collapse of population of some native vertebrate and inveriebrate animals. Concerned attempts should be made to eradicate or control these pests so that they do not become ecologically dominant or destructive on the island.

Around the site:
The high population density and anticipated community development in the area will increase the pressure on the mangroves with traditional uses evolving to non-sustainable activities (Watling, 1985). Illegal felling is a local problem by both license holders and the public within the mangroves of the delta. Illegal fishers coming into the customary fishing grounds from areas such as Suva are also a threat.

There is also the possible impact of the current flood mitigation dredging of the Rewa River on downstream mangrove areas (Watling, 1985).

Conservation Measures Taken: Since 1975, all mangroves have been under the jurisdiction of the Department of Lands and Survey as an integral part of the foreshore. There are also some restrictions on the cutting of mangroves. Watling (1985) had put forward recommendation on the zoning of these mangroves.

Conservation Measures Proposed: As part of the International Waters Programme (IWP), a village in the Rewa Delta has been chosen as a polite site to carry out our community-based mangrove management activities.

Nasoata has also been selected as a focal site of the Pacific Asia Biodiversity Transect Network (PABTRA), a vertical and horizontal mountain to sea transect originating at Mt. Tomanuvi in central Vui Levu and extending, along the Rewa River system to the coral reefs and nearshore ecosystems of southeastern Viti Levu (Keppel, this volume).

Existing scientific research with references: A number of studies have been carried out on the mangroves of the area. Studies on the flora and fauna have been carried out by Raj et al 1982, Thaman et al 2003, and Nating 2002, on mangrove slage by Prasad and South 1992 and on socio-economic of mangrove use by Thaman 1998.

The University of the South Pacific Marine Studies Facility is located … thus students and staff of UPS often carry out field trips and studies in the area. As part of Ramsar work and the establishment of Nasoata as part of the PABITRA transect field visit have been made to the island as well as preliminary work on the terrestrial flora and fauna. In-depth studies have not yet been conducted on the marine fauna and flora, especially in the subtidal and riverine areas around the island, which contain a rich finfish fauna. Studies focusing on the relatively diverse arthropod fauna have also not been conducted.

Current communication / public education programs: Nasoata Island offers a wide range of opportunities to conduct controlled studies of the mangrove ecosystem and other associated terrestial, riverine and marine ecosystems surrounding the island. The island constitutes a very good example of "classical" Rewa Delta mangrove ecosystem with fringing species of *Rhizophaea* and very extensive mature stands of *Bruqiera gymnarrhiza* intertidal swamp forest. Scattered throughout the island, mostly on southern margins of Bolavou Swamp are slightly raised areas with unpresiive stands of *Xyhocarpus granatum and Heriitiera littorali.*

Since the site was chosen to be submitted to the Ramsar convention, a number of groups have visited Nasoata. Field trips to the island have been undertaken as part of geography courses at the University of the South Pacific and as awareness raising on wetlands and mangroves as part of the island, local guildes could provide information to visitors on cultural importance of species and sites on the island.
Current recreation / tourism: The site has the potential to become an education and cultural visit for visiting mangrove researchers or tourists wanting to experience the mangrove areas and Fijian culture. The boat ride on the Nasoata River through the mangroves to Nasoata is an enjoyable and scenic tranquil experience.

Management Authority: Current management of the Nasoata and adjacent mangrove area undertaken by the local landowners (chief). They are responsible for giving permission for outsiders to either use the islands resources or fish in the adjacent waters. For a commercial cutting of mangrove, a license has to be obtained from

the Department of Forestry.

References Cited: Armstrong, J. 1993. Seismic stratigraphy and holocene evolution of Rewa estuary, Fiji. Thesei for MapSc with Honours in Geology. Queensland University of Technology.

Overall, R. 1993. Bativia. Responses to land shortage in a Fijian village community. Thesis University of Nijmegen.

Parry, J. 1978. Ring-ditch fortification in the Rewa delta: Fiji. Arhcaeology from the air using panchomatic infrared and colour photography, Mcgill University, Montreal.

Purnell, M. 1972. Development of rice growing in Rewa River Basin soil survey. UNDP FAO, Rome 1972. Development of rice growing in Rewa River Basin soil-Hydrology. UNDP FAO, Rome.

Smith, A.C 1979. Flora Vitiensis Nova. A new flora of Fiji (spermatophytes only). Vol 1. Pacific Tropical Botanical Garden, Lawai, Kauai, Hawaii.

Thaman, B. 1998. Community utilisation and valuation of mangrove resources in Fiji: Case studies of Sawa, Daku and Nadoria Villages and Kinoya and Tamavua-i-wai urban settlements, Viti Levu, Fiji. Unpublished M.Sc. Thesis, James Cook University of North Queensland, Townsville.

Thaman, R., Keppel, G., Watling, D., Thaman, B., Naikatini, A., Bolaqace, B., Sekinoco, E. and Masere, M. 2003. Masoata Island PABITRA Mangrove and Coastal Study Site, Rewa Delta, Rew Province Viti Levu, Fiji. Unpublished paper.

Watling, R. 1985. Mangrove Management Plan for Fiji. Government of Fiji.

Nadrau Swamp

Wetland Type: Inland Wetlands

Latitude: 17°42'S

Longitude: 177°58'E

Country: Fiji

General Location: In the upper drainage of the Rewa River, close to the watershed of the Sigatoka River, central highlands of Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
			√		√			

Elevation (m): 2,500

AreaSize (ha): 114

General Overview of the Site: Peat bog.

Physical Features of the Site: A montane peat bog in a side valley of the Nanuku Creek in the headwaters of the Rewa River. The Nanuku Creek passes along the downstream edge of the swamp, which receives water from several short streams and also by flooding from the creek. In the deeper parts of the valley, the peat is several meters deep. Colluvium is found along the valley sides, and there is a major alluvial levee along Nanuku Creek. A small pond is located at the western end of the swamp within 50 meters of the Sigatoka River catchment. It appears- that the Sigatoka River has captured the headwaters of the valley in which the swamp is situated, but the drainage patterns including the direction of flow are complicated by tectonic tilting.

The region has a Wet Eastern climate with a dry season rainfall of 800-1,200 mm and a wet season rainfall of 2,000-2,400 mm.

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: The wetland vegetation is herbaceous and differs in several respects from that of lowland peat swamps. The dominant upland peat species are *Urena lobata, Adenostemma lavenia, Cuphea carthagensis, Desmodium heterophyllum and Polygala paniculata.* Typical lowland species such as *Pandanus pyriformis, Sphagnum cuspidatum and Eleocharis ochrostachys* are absent. The pond contains aquatic plants notably *Limnanthemum indicum, Eleocharis dulcis and Nymphaea capensis.*

Noteworthy Flora: No information

Noteworthy Fauna: There is an unconfirmed report of the endangered Barred-wing Rail *(Nesoclopeus poecilopterus)* in swamps on the Nadrau Plateau in 1973 (Holyoak, 1979).

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: Cattle graze the margins of the swamp, but avoid those areas dominated by sedges and ferns.

Factors affecting the site's ecological values: The slopes around the swamp are being cleared and

Conservation Measures Taken: None

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: Ash & Ash (1984); Holyoak (1979).

Nairirileka Swamp

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°34'S

Longitude: 178°53'E

Country: Fiji

General Location: near the mouth of the Ndreketi River on the north coast of Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea level.

AreaSize (ha): 250

General Overview of the Site: A brackish swamp.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Freehold land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Ponds along Dreketi River

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: 16°31'S, 179°07'E; 16°31'S, 179°08'E; and 16°30'S, 179°09'E; in the upper drainage of the Ndreketi River in north-central Vanua Levu, southwest of Naduri.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): 100

AreaSize (ha): 20

General Overview of the Site: A series of freshwater ponds along creeks close to the Ndreketi River.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Rewa Delta Mangroves

Wetland Type: Marine/Coastal Wetlands

Latitude:

Longitude:

Country: Fiji

General Location: Southeast corner of Viti Levu and east of the Suva Peninsula

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea Level

AreaSize (ha): 5130

General Overview of the Site: A large area of rich and diverse mangroves is the delta of the Rewa River. It is also the single largest mangrove swamp in Fiji.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: The Rewa River is the largest river in Fiji. It is estimated that about 1,600 tones of suspended sediment are transported to the mouth of the river each year forming Fiji's most fertile and productive delta with over 5,100 ha of mangrove forest. The mangrove communities are the most diverse in Fiji. The delta is on the windward side of Viit Levu thus exposed to the fill force of the Southeast Trades. As a consequence, much of the mangrove is in the backwater locations. The mean tidal range is about 0.9 m during neap tides and 1.3 m during spring tides. The delta has a Wet Eastern climate with a dry season rainfall of 1,200-1 600 mm and a wet season rainfall of 2,000-2,400 mm.

General Ecological Features: Six alliances have been distinguished; the seaward alliance, Rewa tiri alliance, dogo forest, mixed alliance, landward alliance, boreti alliance.

Noteworthy Flora: The mangrove forests are foristically the most diverse mangrove communities in Fiji. All the mangrove species are represented.

Noteworthy Fauna: No information

Social and Cultural Values: Culturally the area has a high significance with an abundance of archaeological sites and cultural landscapes throughout the area and strong cultural association with the people whole live there.

Land Ownership / Tenure: In re-European contact times the Rewa Delta is believed to have supported one of the densest human populations in the Pacific. The population has declined since then. This is still by far the largest community closely associated with mangroves in Fiji.

Land Uses: The mangrove flora provides a variety of products and services to the local people including firewood, construction material, fishing devices, dyes, fish poison, food and medicine (Pillai 1987). Many of molluscs and crustaceans are edible. In the past (1945) the area was an important source of mangrove fuel (firewood) for industrial and domestic purposes. In recent years, approximately 5,000 cubic meters of firewood have been extracted annually for domestic needs by license holders (Walting 1985).

Factors affecting the site's ecological values: Factors (past, present pr potential) adversely affecting the site's ecologcial character, including changes in land use development projects. The high population density and anticipated community development in the area will increase pressure on the mangrove with traditional uses evolving to non-sustainable activities (Watling 1985). A long-term threat is reclamation for agriculture. Illegal felling is also a problem locally.

Conservation Measures Taken: These mangroves since 1975 have been under the jurisdiction of the Department of Lands and Survey as an integral part of the foreshore. There are some restrictions on cutting. Walting (1985) has recommendations on zoning of the mangroves

Conservation Measures Proposed: Department of Forestry

Existing scientific research with references: None

Current communication / public education programs: None

Current recreation / tourism: No information

Management Authority: Department of Lands and Survey

References Cited: No information

Rewa River Watershed

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Saweni Mangroves

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: No information

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: No information

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership /Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Tuvuca Lakes

Wetland Type: Not Available

Latitude: 17°41'S

Longitude: 178°49'W

Country: Fiji

General Location: on the island on Tuvuca in the Lau Group.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Unknown.

AreaSize (ha): 0

General Overview of the Site: A group of four or five small brackish lakes in a depression in the interior of Tuvuca Island, a raised coral island with an area of 13 sq.km (Dahl, 1986).

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Taketakelo Pond

Wetland Type: Marine/Coastal Wetlands

Latitude: 16°35'S

Longitude: 179°06'E

Country: Fiji

General Location: near Naravuka in the north-central interior of Vanua Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): 50 m.

AreaSize (ha): 20

General Overview of the Site: Freshwater pond.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Upper Dreketi River Swamp

WetlandType: Marine/Coastal Wetlands

Latitude:

Longitude:

Country: Fiji

General Location: In the upper drainage of the Ndreketi River in the north- central hills of Vanua Levu, 15 km east of Navidamu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): 100

AreaSize (ha): 500

General Overview of the Site: Six freshwater swamps: Korowaiwai Swamp, duriwailevu Swamp, Ndranowakalevu Swamp, Narualango Swamp, Vunimolau Swamp and Ndangau Swamp.

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Upper Navua Gouge (Upper Navua Conservation Area – UNCA)

Wetland Type: Inland

Latitude: 18.07'S

Longitude: 177.52'E

Country: Fiji

General Location: The Upper Navua Gorge and UNCA are located in the Province of Serua on the south central side of Viti Levu. The nearest towns are Pacific Harbour, located about 40 kilometers away and Navua Town, located along the lower reaches of the Navua River. Approximately 15 villages/settlements are located along the Navua River including the larger town of Navua (Navua Town) located near the mouth of the river.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
√	√	√					√	

Elevation (m): 110

AreaSize (ha): 615

General Overview of the Site: The upper Navua River cuts a narrow gorge through the province of Serua in the central highlands of Viti Levu. The Navua River represents Fiji's third largest freshwater drainage. The gorge is approximately 75meters deep and varies in width from 5 to 25 meters. The Upper Navua Conservation Area (UNCA) encompasses this river gorge and approximately 58% of the entire catchment area. Lush highland rainforest surrounds the entire drainage and provides a host of botanical cures that are utilized by the indigenous peoples of the area. The forest, river and associated biodiversity provide the necessary supplies and food required for daily living and a wide range of ecosystem services to the entire catchment area including flood control for lower areas. The site is nationally and internationally exceptional in terms of both fauna and flora.

The waters of the site contain breeding populations of at least two endemic freshwater fish species (*Redigibius leveri* and *Schismatogobius chrysonotus*) which should be considered as vulnerable due to their limited range and one undescribed new taxa. These taxa represent at least a quarter of the endemic freshwater fish species in the country. The forests surrounding the gorge contain 17 endemic species of birds, 15 of which are endemic to the island of Viti Levu. Notable are the globally endangered Pink-billed Parrot Finch (*Erythrura kleinschmidt*)and the vulnerable Black-faced Shrikebill (*Clytorhynchus nigrogularis*), Masked Shining Parrot (*Prosopeiapersonata)*, Kadavu Parrot (*Prosopeia splendens*) and Giant Forest Honeyeater (*Gymnomyza viridis*). Also notably are the endangered Fiji Banded Iguana (*Brachylophus fasciatus*) and the vulnerable Samoan Flying-Fox (*Pteropus samoensis*). A highly significant component of the vegetation is the endemic sago palm *Metroxylonvitiense*, which must be considered as endangered, as it is rapidly disappearing in its more accessible coastal habitats because of over-utilisation. The species is super-abundant in the gorge, having a population consisting of several thousands of regenerating individuals. In the near future this population may constitute the last undisturbed natural populations of this palm. The site is also notable as having the most well developed examples known from Fiji of ultimate riparian vegetation (adapted to fast-flowing rivers), river bank and gorge and cliff-face vegetation. The site contains at least five globally threatened plants including the endemic family Degeneriacae containing the single species *Degeneria vitiensis* thought to be an ancestor to all flowering plants.

Only one village (Nabukelevu) is located within the Upper Navua Conservation Area, however in earlier times the area hosted a number of village sites that have since been abandoned. There are also a number of burial grounds and other sacred sites protected by local custom and by the UNCA where appropriate. These ancient village sites are now protected by local custom and are well known by the indigenous community. Today, logging is perhaps the greatest income provider for the landowners followed by agriculture and now by a recently established eco-tourism industry (Rivers Fiji Ltd.) that runs river trips through the gorge. The numerous villages located downstream of the Upper Navua Conservation Area depend in a large part on the bounty of protein provided by the fish, prawns and molluscs found in the waters of the Navua River.

Physical Features of the Site: The Upper Navua River gorge is approximately 75 meters deep and varies in width from 5 to 25 meters. The geology is described as navua mudstone, which is further defined as well-bedded mudstone and fine-grained sandstone, minor limestone and basal conglomerate. *(Geology of Northern and Central Viti Levu ~Navua River Map GS 429 - Viti Levu Sheet 18).* A small deposit of andesitic flows and pyroclastics is located near the village of Nabukelevu. The age of the mudstone is dated to the Mio-Pliocene. Pieces of fossilized coral and petrified wood can be seen within the layers of mudstone.

Physical Features of the Catchment Areas: see physical features of the site

Hydrological Values: The Navua River represents Fiji's third largest freshwater drainage with only the Rewa and Sigatoka Rivers draining larger areas. The Upper Navua River has approximately 50 waterfalls in the dry season and easily 100+ during the wettest times of the year. There are approximately 53 mapped major side streams that feed into the river within the UNCA. Hydrologically, the Upper Navua is unique in that the upper reaches of the Navua river are channelled into a narrow and sheer-walled canyon near Managaqe Creek creating a funnel effect that sees water fluctuations of 30 feet and greater during severe weather. This gorge is likely to play a role in flood control for lower lying areas of the catchment. Gauges were installed in the canyon some years ago indicating CFS data maybe available for future flow description.

General Ecological Features: The Upper Navua Conservation Area is one of the very few relatively untouched major drainages remaining in Fiji. From an ecological perspective this feature alone makes it especially significant. Maintaining the ecological character of the site is crucial in maintaining ongoing ecosystem services in the entire catchment.

Noteworthy Flora: The site is notable as having the most well developed examples known from Fiji of ultimate riparian vegetation (adapted to fast-flowing rivers), river gorge and cliff-face vegetation. Although the near-river flora is relatively impoverished compared with the relatively species-rich tropical lowland rainforest, it consists of native species (many of which are endemic) that are restricted to fast-flowing river habitats. Surprisingly, this ultimate riparian vegetation also included the conifer *Podocarpus neriifolius*. While this species is also found in lowland rainforest and high-altitude forest in Fiji and other countries, it has never been reported as a riparian plant. Possibly the most significant component of the vegetation is the endemic sago palm *Metroxylon vitiense*, which must be considered as endangered, as it is rapidly disappearing in its more accessible coastal habitats because of over utilisation. The species is super-abundant in the gorge, having a population consisting of several thousands of individuals. In the near future this population may constitute the last undisturbed natural populations of this endemic palm.The site also contains the endemic family Degeneriacae with the monotypic *Degeneria vitiensis.* This family is thought to be a Gondwanaland relic and an ancestor to all flowering plants. It is listed as Vulnerable but is widespread in Fiji. Also present in the site are at very least four globally threatened plants identified as *Gulubia microcarpa, Astronidium pallidoflorum, Aglaia parksii, Geissois superba.*

Noteworthy Fauna: To date preliminary surveys have been done of ichthyofauna, avifauna and vegetation within the UNCA. These surveys have revealed several noteworthy fauna. The most notable of the aquatic fauna are at least two endemic freshwater fish species (*Redigibius leveri* and *Schismatogobius chrysonotus*) which should be considered as vulnerable due to their limited range and one undescribed new taxa. These taxa represent at least a quarter of the endemic freshwater fish species known in the country. The forests surrounding the gorge contain 17 endemic species of birds, 15 of which are endemic to the island of Viti Levu. Notable are the globally endangered Pink-billed Parrot Finch (*Erythrura kleinschmidt*) and the vulnerable Black-facedShrikebill (*Clytorhynchus nigrogularis*), Masked Shining Parrot (*Prosopeia personata)*, Kadavu Parrot (*Prosopeiasplendens*) and Giant Forest Honeyeater (*Gymnomyza viridis*). Also noteably are the endangered Fiji Banded Iguana (*Brachylophus fasciatus*) and the vulnerable Samoan Flying-Fox (*Pteropus samoensis*).

Social and Cultural Values: The only village located on the upper reaches of the UNCA is Nabukelevu. The village is very traditional, in a modern sense. Most homes are framed with milled timbers and finished with corrugated siding, although a few structures are still designed and built in a traditional manner. Electricity from generators, flush toilets and other modern conveniences are available but not many families have them. The village is still presided over by the village chief or headman and the elders.

The Upper Navua is a primary source of protein for the village as is the surrounding rainforest where plants are collected and pigs hunted. Gardens/plantations are still tended in a relatively traditional manner with some produce being sold in the markets but most being kept for personal use. Dalo and kasava are the primary food crops, with some fruit, and other vegetables being grown in less quantity. Some livestock are kept; mostly cows, pigs and chickens.

The local community is very aware of their existence and assures any land use around these areas is done with great care and concern. Logging provides the greatest influx of employment opportunities. The only other outside employment opportunity comes from Rivers Fiji Ltd in the form of guides, porters and trail maintenance. The village itself, their cultural practices, their rituals and their openness and hospitality offer a great resource, both for ecotourism but for also the cultural exchange, education and participatory action that will ensure that the ideals of the Ramsar Convention are achieved.

The main villages associated directly with the UNCA, Nabukelevu and Wainadiro, constitute cultural resources that have for centuries been associated with the river. They are riverine societies that have developed, over decades and centuries an intimate knowledge of the river, its ecology, its biodiversity and the economic, social and ecological value of the river and its resources to their cultural continuity. This knowledge has served, and will continue to serve as the foundation for the long-term preservation and sustainable use of the river and near-river resources within the UNCA.

There are a number of cultural sites (abandoned villages, burial caves, etc.) located in or near the UNCA. Traditional customs seem to provide adequate protection for the sites at present.

Land Ownership / Tenure: All the land within and surrounding the Ramsar site of Upper Navua Gorge is owned by the traditional land owning families - hereafter called mataqali. There are eight mataqali that lay claim to the land and the elders of these families live in several different villages in the region. They are the mataqali Navau, Sauturaga-Nabukelevu, Sauturaga-Nakorovou, Ketenatukani, Vunimoli, Vunitavola, Cawanisa, and Naviaraki-

Korovisilo. The land is currently under conservation lease to a private enterprise, Rivers Fiji Ltd of Pacific Harbour which operates commercial rafting trips on the Navua River and is an eco-tourism venture working with the land owners and the Native Land Trust Board to preserve the Upper Navua Gorge.

Land Uses: Current land use reflects the work of Rivers Fiji Ltd. to set aside the Upper Navua Gorge as a conservation area. In November of 2000, Rivers Fiji successfully acquired a conservation lease covering 16 kilometers and 200 meters to either side of the river. The Upper Navua Conservation Area is the first of its kind in Fiji and an attempt to protect this section of river from logging and mineral interests while providing tourist dollars to the NLTB, and the local villages and mataqali for setting their land aside for conservation. Rivers Fiji currently operates between 2 and 4 commercial white-water rafting trips per week through the UNCA and a percentage of the income from each trip goes directly to two villages and eight mataqali.

The surrounding area is either under logging lease or, in select areas, used for subsistence farming by the local villagers. The rich cultural landscapes, which are confined mainly to the lower portions of the river near Wainadiro, include shifting agricultural gardens, grazing lands, trails and tracks, fishing grounds, traditional camping or refuge sites, secondary forests and agroforests, and Nabukelevu and Wainadiro Villages. All of these landscapes offer considerable potential for ecotourism development and include culturally significant biodiversity and associated history that needs to be preserved.

The shifting agricultural gardens and associated agroforestry systems are a prominent feature of the Fijian cultural landscape. They include major staple food plants, such as taro (**dalo**), cassava (**tavioka**), yam (**uvi**)and sweet potato (**kumala**) and associated plants, such as bananas and plantains (**jaina** and **vudi**), coconut palms (**niu**), breadfruit (**uto**), mango (**maqo**), papaya (**weleti**), a range of citrus trees (**moli**), Polynesian viapple(**wi**)(*Spondias dulcis*), Malay apple (**kavika**)(*Syzygium malaccense*) and a wide range of other culturallyuseful multipurpose trees and plants, such as sugarcane (**dovu**), Fiji asparagus (**duruka**)(*Saccharum edule*)pineapple (vainaviu), pandanus (**voivoi**) and kava (**yaqona**)(*Piper methysticum*), the culturally important plant that yields the socially and spiritually important beverage known by the same name. Open grazing areas, with cattle and horses (a major means of mountain and river valley transport) are increasingly common closer to Wainadiro Village, and, although constituting relatively degraded landscapes, offer cultural landscape diversity and have become an important component of the Fijian cultural landscape.

The river constitutes part of the traditional fishing grounds or **iqoliqoli** of the Fijians landowners. Along the river are countless named locations known to be good fishing sites or “holes”, many of which have traditional names, or which are only known to the best fishers (both men and women). Different types of sites (e.g., deep holes, areas of rapids, slow-flowing section, particular tributaries, etc.) are favored habitats for different food species, such as freshwater eels (**duna**), prawns (**ura**), crabs (**sarakali**), shellfish (**sici**) or the wide range of freshwater finfish (**ika**) found in the river system. There are also a number of traditional camping sites, caves or safe havens, again, most of which have names that have been used for centuries by fishers, travelers or, in the past warriors, for temporary stays or to take refuge. The names and histories or these places need to be preserved and serve as both a cultural and potential ecotourism resource.

The secondary forests and agroforests, which are most common between Nabukelevu and the upper part ofthe UNCA and near Wainadiro, are perhaps one of the most culturally and economically important resources and of considerable ecotouristic interest, with most of the plants and animals being of some cultural importance to the Fijian people. These secondary (disturbed or modified) forests contain many useful wild or semi-wild food trees, an incredibly wide range of medicinal plants, are a main source of firewood, construction materials, dyes, perfumes, fragrances and body ornamentation, a wide range of handicrafts and many other products and services that could not be reproduced or replaced by the moderncash economy. Of particular importance are a number of named varieties of wild yam (**tivoli, rauva andtikau**), birds (**manumanu vuka**), fruit bats (**bekwa**), edible cicadas (**nanai**) and the wild pig (**vuaka niveikau** or **vore**).

Factors affecting the site's ecological values: The site's ecological character has remained relatively untouched because of its remoteness and inaccessibility. The Upper Navua Gorge is currently under lease for 25 years with the option for renewal. This lease restricts access and prevents extractive interests from damaging the ecology of the area. Rivers Fiji is seeking extension of the lease to 99 years. The introduced Cichlid (*Oreochromis mossambicus*) was found in the UNCA. This is the most widely introduced freshwater fish in the Pacific and is a serious a pest competing for food with native fish and birds. This species may contribute to a decline in water quality and may threaten the endemic species fishes present. Several weedy species may compete with the native vegetation and eventually significantly reduce their abundance. The major threats are common bamboo

(*Bambusa vulgaris*), hooked pepper bush (*Piper aduncum*), trailing daisy (*Wedelia trilobata*), and African tulip tree (*Spathodea campanulata*). The latter two are presently restricted to the lower reaches of the gorge but will inevitably move upstream (unless actively controlled), as both are weeds of disturbed sites and the river is a naturally disturbed through flooding. The common bamboo has already spread throughout the river and it is probably too late for any control measures.

The ecological character around the site is particularly vulnerable to extractive interests, primarily logging, that have run-off implications for the Upper Navua Gorge and beyond. Logging increases erosion and subsequently the siltation into the streams and creeks that feed the Upper Navua River and ultimately flow onto the barrier reefs of Beqa Lagoon downstream. Increased siltation will most likely have adverse effects on the freshwater fauna in the gorge as well. Run-off from the logging roads has started to discolour some of the side streams flowing into the UNCA. Other potential risks might come from hydroelectric development in the future. Previous studies to determine the viability of such a project were abandoned for another site in Fiji.

Conservation Measures Taken: In November 2000, Rivers Fiji received permission from Fiji's NLTB, the relevant mataqali and Fenning Pacific (logging company) to re-designate the Upper Navua Canyon from a logging lease to a conservation area lease. To help Rivers Fiji support management of the conservation area they have also been involved in establishing an eco-tourism focused company that among other things ascribes to the following guiding principle.

"To enhance visitors and indigenous peoples awareness of, and appreciation for the culture and environment by providing activities that promote conservation and preservation through socially responsible and environmentally sensitive interaction with the people, landscape and ecosystems that make the Fijian Highlands so distinct and unique."

Rivers Fiji Ltd. won the 1999, Fiji Visitors Bureau "Best Activities" award and has been recognized for its sustainable nature by winning the Environmental Tourism award in 2001 for Fiji granted by the Ministry of Tourism.

Conservation Measures Proposed: Rivers Fiji Ltd is seeking the extension of the UNCA lease from 25 to 99 years. Rivers Fiji is also seeking outside interest in setting aside more land along the UNCA corridor aside for conservation. As the business becomes more successful Rivers Fiji hopes to increase the size of the conservation area both in length and width. It is hoped that site will eventually gain National Park status and complete protection of the area. Perhaps one of the greatest steps to be taken in the conservation of this area is a proper boundary survey and marking of the borders to prevent accidental and deliberate encroachment. A European Union funded, South Pacific Applied Geoscience Commission (SOPAC)/ Mineral Resources Department implemented project is being planned to examine the entire Navua watershed focusing on water resource management and natural hazards.

Existing scientific research with references: Throughout 2003 a number of scientific expeditions have been made within the gorge and surrounding areas to ascertain the biodiversity and ecological character of the site. These are among the first to systematically document the biodiversity of the gorge. A series of four surveys were undertaken by Wetlands International – Oceania (ichthyofauna), Birdlife International, Environmental Consultants Ltd (Avifauna), South Pacific Regional Herbarium (flora), University of the South Pacific. All of the inner gorge surveys were heavily subsidised and made logistically possible by Rivers Fiji Ltd.

Current communication / public education programs: Conservation education is carried out by Rivers Fiji Ltd. in conjunction with its commercial rafting operation. In addition to developing the conservation area and river management plan for the Upper Navua Gorge Conservation Area, Rivers Fiji has been responsible for training guides in the minimum impact strategies necessary for the conservation of this unique waterway. Employees at Rivers Fiji have been busy developing interpretive materials for their guests and the local communities surrounding the canyon. It is their hope this will help both native landowners and visitors alike appreciate the river canyon as a resource critical to the health of an entire ecosystem that stretches all the way from some of Fiji's highest mountains to the depths of the surrounding sea.

Wetlands International –Oceania pulled together a team from the University of the South Pacific, Birdlife International – Fiji Programme, Environmental Consultants Ltd, Department of Environment, Fijian Affairs Board and National Trust that visited the site and village of Nabukelevu in April, 2003. This team carried out a multidisciplinary survey activities and also discussed Ramsar and wetland conservation with elders and community members. Subsets of this initial team have re-visited the site and village three times throughout the

year to continue discussions on the wise use of the site and to continue survey activities. Birdlife International prepared awareness pamphlets which were given to the villagers with a copy of the Fijian-translated version of the survey report done by the team from the initial visit.

Efforts are also planned by Rivers Fiji Ltd that will take teachers and students from the surrounding villages and mataqali on river trips with members of the Department of Environment and Forestry. These trips would have a strong conservation message and the teachers/students will then become the ambassadors for Rivers Fiji's conservation area movement for the UNCA. Other trips will be planned with local administrators from the Fiji Visitors Bureau, Department of Environment, Department of Forestry, Ministry of Lands and Minerals etc. The focus of these trips will be to cultivate stronger cooperation between Rivers Fiji Ltd. and the various land management agencies involved in long-term conservation and protected/reserved land designation. The non-government organizations Live and Learn and World Wildlife Fund are in the process of producing environmental educational materials for distribution to schools and villages in the area

Current recreation / tourism: Tourism to Fiji's highlands is a relatively new development since most of the tourism focus is based around the coastal areas of Viti Levu and surrounding islands. However, in 2002 the UNCA gained international exposure through the televised international race called “Eco-challenge”. Logistics for this race were assisted by Rivers Fiji who hosted a section of the race. Whitewater rafting and kayaking continue to take place five days a week within the Upper Navua Conservation Area led by Rivers Fiji (see previous section). There is considerable additional potential for trekking and camping/lodging to be developed in this area as infrastructure improves with time. Other possible tourism attractions might include canyoning along approved streams, day-hikes to waterfalls and mountain biking on the abandoned logging tracks. Recent communication between Birdlife International and Rivers Fiji Ltd indicate a strong possibility of birdwatching tours being done in the area. It should be noted that Rivers Fiji Ltd. won the 1999, Fiji Visitors Bureau “Best Activities” award and has been recognized for its sustainable nature by winning the Environmental Tourism award in 2001 granted by the Ministry of Tourism.

Management Authority: The land and waters within the UNCA are under the direct management of Rivers Fiji as per the terms and conditions of their lease with the NLTB. A Management and Permit Plan for UNCA has been prepared by Rivers Fiji as part of their lease requirements. The plan currently primarily deals with the issuing of permits, management of tourism activities and distribution of benefits to landowning groups. Government entities involved with the potential long-term conservation issues in the UNCA would include the Department of Forestry/Commissioner of Forests, Department for Environment, and Department of Lands and Mineral Resources.

References Cited:

Dutson, G., Masibalavu, V., Salusalu, B.,Watling, D. 2003. Birdlife International Fieldwork Report 8: Bird Survey of Navua Gorge. Birdlife International Fiji. 3pgs

Jenkins, A. and Boseto, D. 2003. Fishes of the Upper Navua Conservation Area, Viti Levu, Fiji. Technical Report. Wetlands International – Oceania. 4 pgs.

Keppel, G. and Thaman, R. 2003. Preliminary report on the vegetation of Upper Navua Conservation Area (UNCA). Technical report. University of the South Pacific. 4pgs

Masibalavu, V., Gaunavinaka, T., Liley, D. and Lake, S. 2003. Birdlife International Fieldwork Report 10: Bird Survey of Nabukelevu Forest. Birdlife International Fiji. 4pgs

Geology of Northern And Central Viti Levu - Navua River Map GS 429 - Viti Levu Sheet 18

Vunivia Catchment Area

Wetland Type: Marine/Coastal Wetlands

Latitude: 15.16'S

Longitude: 179.47'E

Country: Fiji

General Location: It is located at the extreme north-eastern end of Vanua Levu at the base of Udu Peninsula. The nearest major point of access is Labasa, aproximately 2 hours driving time distance (4 hours by boat)

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m): 0 to 10

AreaSize (ha): 4250

General Overview of the Site: This area extends from the coast where extensive mangroves stands occupy the tidal fringes of the Vunivia and Bourewa River mouths to the forested steeplands of the hinterland. It encompasses both wet and dry zone forests communities and the imported forested ecolines between these two ecosystems.

Physical Features of the Site: The entire area is underlain by volcanic rocks of the Udu series (Berry and Howard, 1973). Toward the coast, and in particular on the Naqaralevu peninsula and the offshore island of Bekana and Tilagica, the predominant rocks are soft pumice sediments which have been eroded to produce a striking coastal fringe of white scalloped formations. This soft material has been weathered down to create allow rolling landscape immediately inland from the coast.

Further inland, coarse *rhyolite breccia* has presented a greater resistance to erosion. These rocks have formed dramatic steel lands with deep valley systems, high narrow ridges and volcanic plugs forming peaks with their associated precipices. These steep lands extends southward to the middle reaches of the Vunivia catchment where they culminate in a high traverse ridge system which is penetrated by the major rivers in steep valleys and gorges. This ridge system forms part of the southern boundary of the area. Beyond it to the south the topography changes to the easier slopes of the central basin of the catchment. This area is currently being utilised for timber production.

Again in the eastern sector of the area the steep lands give way to less deeply dissected country which forms the valley of the Kedra river. Along the lower reaches of the river valleys, small areas of low lying alluvial deposits occur, covered by forests or swampland subject to inundation during periods of flooding. The proposed reserve is divided into two distinctive climatic zones in the upper catchments. To the east where the passage of the weather system from the windward side is not obstructed by major ridges, the land receives heavy rainfall and thus supports wet zone soils and forests. Dry zone soils and vegetation occur on the low rolling lands adjoining the leeward northern coast and on steep lands in the rain shadow produced by the major traverse central ridge.

The climate ranges from that of a strong dry season. Close to the coast, to an increasingly moderate or weak dry season at the furthermost points inland and in the eastern sector in the catchment area of Kedra River. This coincides with a variation of annual rainfall from approximately 2300mm in zones of strongest dry season (six months of the year) to approximately 3200mm in zones of moderate to weak dry season. Thus the area is located across a zone of climatic transition and this is reflected in the presence within its boundaries of a mixture of wet and dry zone forest communities.

The soils are red - yellow podsols derived from the acidic volcanic rocks and are strongly weathered and leached. The steep lands of the interior supports a stonny sandy clay of the Rauriko series whilst on the rolling hills close to the coast there is a fine sandy of the Dogotuki series. Both soil types have developed in the presence of a moderate dry season. Nearest the coast, and in particular on the Naqaralevu peninsula, a strong dry season has produced sandy clay loams of the Nukusa and Nukudamu series. Swampland pockets adjacent to the coast and to the lower river reaches support gley soils of the Kedra sandy clay loam series.

Physical Features of the Catchment Areas:

Hydrological Values: The proposed site is within a major watershed area comprising several creeks and 3 major rivers.

General Ecological Features: Thick strands of mangrove forest cover the entire estuarine location and up the river reaches. Forest / literal forest still in pristine condition grading into forest

Noteworthy Flora: Strands of all species of mangroves (*Dabi / Selala / sagale / Tiri* and etc.) mangrove associates. Extensive forest species in / along esturine location.)

Noteworthy Fauna: Crabs and other mangrove species / fish species / (pers. comm)

Social and Cultural Values: The Kedra - Vunivia - Bourewa forest catchments, shore and adjoining marine reef systems have been used by generations of Mataqali as an intergal part of their culture providing a myriad of items for daily living. Evidence of old settlements is plentiful, particularly along the coast where there are generating old gardens, terraced hills and fort sites.

Land Ownership / Tenure: Mataqali Namako owns 12,845 acres of the Vunivia catchment. This area stretch from the village of Kedra and along the western side of the Kedra creek to the eastern banks of the Bourewa river. Almost all of the middle to the upper parts of the Vunivia River flows within Namako land. Mataqali Naduru owns 43.5 acres of the Vunivia catchment. This area covers a portion of the Vunivia River, north of the Namako land and east of the Tagiituba land. Tokatoka Tagiituba owns 1,609 acres streching from east of the Nasavu River mouth to the western banks of the Vunivia river, about 3 kilometers from its mouth. Mataqali Nautuutu owns 2,175 acres mostly on the north eastern portion of the Vunivia catchment.

The northern shore of the Vunivia Catchment is divided into a few lots of Freehold Lands

Land Uses: The area is known intimately by the villagers as it continues to feed them and provide them with housing and other materials. It is also currently being utilised for timber production.

Factors affecting the site's ecological values: All of the dry forest in the upper catchments is zoned as "Protection forest" although there are at present several logging coupes planned for this land. Land resource study on this area warns that the protection forest should not be logged because of the dangers of erosion and excessive run-off. Berry and Howard (1973) state that "Most of this forest is too steep and inaccessible for economic login. Selective felling for valuable species such as Dakua Makadre and Yaka is not recommended because it is the logging skids and tracks that do the damage and because the rock is deeply weathered and crumbling and would erode all too easily if exposed."

Erosion in these upper catchments would affect the water supply for the downstream, the mangrove and wetland areas and the extensive and productive reef system offshore.

Conservation Measures Taken: Currently an agreement stands with the Forestry Dept. (Proposed Forest Reserve)

Conservation Measures Proposed: As above: Total conservation of watershed / mangroves / reefs.

Existing scientific research with references: Forestry Department. Sean Weaver to find out.

Current communication / public education programs: Department of Forestry has done some of these

Current recreation / tourism: The area is within a few hours drive of Labasa and is already visited by yachts. Provision of guided day walks, boat trips and village-like accommodation in this remote area could provide a visitor with a uniquely "Fijian" experience.

Management Authority: Native owners / Govt. Depts

References Cited: Gray, A.J. Fiji Wetlands in Scott, D.A. (edt.), 1993, A Directory of Wetlands in Oceania., International Waterfowl and Wetlands Research Bureau (IWRB), Slimdridge, United Kingdom.: 83-84

Vaturu Dam

Wetland Type: Inland Wetlands

Latitude: 17°44'S

Longitude: 177°40'E

Country: Fiji

General Location: In the valley of the Nadi River, 25 km southeast of Lautoka and 25 km north-northeast of Nadi, Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m): 510

AreaSize (ha): 160

General Overview of the Site: Freshwater reservoir.

Physical Features of the Site: A water storage reservoir approximately 5 km long and up to 1.5 km wide on the edge of a plateau in the upper drainage of the Nadi River. The catchment area rises to about 800 meters above sea level. The dam has a maximum depth of 37 meters and a total storage volume of 27 million cubic meters. The average water flow into the reservoir is 2.4 cubic meters per second. Access is very difficult except along the ridge routes, the plateau falling away steeply on all sides.

The region has a Dry Western climate with an average annual rainfall of about 3,600 mm and a mean temperature of 19.7°C. Sunshine hours total 157, and a wind speed of 2.6 knots is average. Most of the precipitation falls during storms and cyclones.

Physical Features of the Catchment Areas: No information

Hydrological Values: The reservoir supplies Nadi and Lautoka with water and is thus of considerable economic importance.

General Ecological Features: The water catchment is covered in dense closed montane tropical rainforest. No detailed botanical description of the forest is available.

Noteworthy Flora: No information

Noteworthy Fauna: At least 42 species of birds have been recorded in the vicinity of the reservoir, including the Long-tailed Cuckoo (*Eudynamis taitensis*), a non-breeding migrant from New Zealand. Giant geckoes and skinks are found in the area as well as the Pacific Boa (*Camdoia bibronii*). Amphibians such as the cane toad (*Bufo marinus)* are present, as well as the Pacific Fruit Bat (*Pteropus tonganus*). The Indian Mongoose (*Herpestes semipunctatus*), mice, rats and the domestic pig are present.

Social and Cultural Values: No information.

Land Ownership / Tenure: The reservoir and its catchment are on Native land, ownership being shared by the Mataqali, Qoqa and Nasaucoke from Nagado, and the Naivua and Navunito from Yaloku.

Land Uses: Vaturu Dam supplies water to Nadi and Lautoka. There is some fishing by local people.

Factors affecting the site's ecological values: None known.

Conservation Measures Taken: None.

Conservation Measures Proposed: The reservoir and forests of its catchment area were proposed as an Amenity Reserve (Vaturu Forest) in the Ninth Development Plan (Anon, 1989).

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: Recreational-based activities have potential on the reservoir, but at present there is insufficient local utilisation to make it financially viable. It is in both the landowners' interest and the government's interest to make Vaturu a viable tourist attraction.

Management Authority: The Native Lands Trust Board and the Public Works Department are the authorities concerned with development.

References Cited: Anon (1989); Fawcett, Wilton and Bell Ltd (1983).

Vatulele Pools

Wetland Type: Marine/Coastal Wetlands

Latitude: 18°32'S

Longitude: 177°38'E

Country: Fiji

General Location: on Vatulele Island, 33 km off the south coast of Viti Levu, almost due south of Korolevu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea level.

AreaSize (ha): 0

General Overview of the Site: Two brackish tidal ponds on rocky shores, with an endemic red prawn (*Crustacea*). The prawn is strictly protected by traditional taboos. The site was recommended for protection in the 1980 Parks Plan (Dahl, 1986; TCSP, 1990).

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: Native land.

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Vuaguava Salt Lake (Kabara, Lau)

Wetland Type: Marine/Coastal Wetlands

Latitude: 18°52'S

Longitude: 178°54'W

Country: Fiji

General Location: on the island of Vuaqava (Vuanggava) in the Lau Group.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m): Sea level.

AreaSize (ha): 0

General Overview of the Site: A tidal saltwater lagoon (marine lake) in the central basin of Vuaqava Island, a raised coral atoll with an area of 7.7 sq.km. The lagoon is used as a turtle pen by Kambara Islanders. The site

was recommended for protection in the 1980 Parks Plan (Dahl, 1980 & 1986).

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information

Vunimoli Swamp

Wetland Type: Inland Wetlands

Latitude: 18 12'S

Longitude: 178 11'E

Country: Fiji

General Location: It is located about 3 km Northeast of Navua Town, Namosi, Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9
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Elevation (m): Sea Level

AreaSize (ha): 507

General Overview of the Site: This is a freshwater wetland, the second largest peat swamp in Fiji

Physical Features of the Site: The swamp is surrounded by hills to the northeast, by coastal and estuarine mangroves to the east and by levees of the former tributaries to the Navua River. Soil beneath the peat tends to be fine textured alluvium to the north and west and coarser coastal deposits tend to be common towards the southeast. The maximum depth of the peat is about 2m. Brackish salt water tends to extend 50 - 100m inland from the mangroves. Rainfall during the rainy season ranges from 2000 - 2400mm. During the dry season, it ranges from 1200 - 1600mm.

Physical Features of the Catchment Areas: No information

Hydrological Values: The main one tends to be Groundwater Recharge and Flood Control. When considering the fringing mangroves then Sediment Trapping and Shoreline Stabilization tend to be of importance also

General Ecological Features: Previous studies show that vegetation types tend to vary a lot. For example;

* Peat - vegetation tend to be dominated by the fern *Dicranopteris linearis* and the sedges *Scleria polycarpa* and *Eleocharis dulcis.*

* Deeper peat - vegetation is dominated by patches of *Pandanus pyriformis,* and some shrubs like F*agraea berteriana, Glochidion cordatum and Melastoma denticulatum.*

* Saline grey soils - *Eleocharis dulcis, E. ochrostachys, Nephrolepis biserrata, Spaerostephanos unitus, Acrostichum aureum, Pandanus pyriformis.*

Noteworthy Flora: Some noteworthy flora within this area would be;

* *Eleocharis spp*. (Kuta), endangered species, cultural/traditional values.

* *Fagraea berteroana* (Bua ni Viti), indigenous, cultural/traditional values.

* *Pandanus pyriformis* (Vadra), endemic

Noteworthy Fauna: *Anguilla spp*., etc (not enough data found)

Social and Cultural Values: Fisheries production. There are several ring ditch fortification sites. Also present are abandoned old garden sites

Land Ownership / Tenure: Part of it is Native Land and the other part is Freehold of which Ross Estate owns a large portion

Land Uses: Some parts are being drained for agriculture

Factors affecting the site's ecological values: Deforestation of the surrounding forests to the north, Agricultural development and expending Queen's Road Highway

Conservation Measures Taken: None

Conservation Measures Proposed: None. Peat swamps of the Navua Delta have been identified as sites of conservation interest meriting special protection (Dahl 1980, 1968)

Existing scientific research with references: None

Current communication / public education programs: None

Current recreation / tourism: None

Management Authority: None

References Cited: Gray, A.J. Fiji Wetlands in Scott, D.A. (edt.), 1993, A Directory of Wetlands in Oceania., International Waterfowl and Wetlands Research Bureau (IWRB), Slimdridge, United Kingdom.: 83-84

Waidradra Palms

Wetland Type: Not Available

Latitude:

Longitude:

Country: Fiji

General Location: at the Waindrandra Agricultural Research Station at Nanggali on Viti Levu.

Ramsar Criteria for Inclusion:

Group A Criteria 1	Group A Criteria 2	Group A Criteria 3	Group A Criteria 4	Group B Criteria 5	Group B Criteria 6	Group B Criteria 7	Group B Criteria 8	Group B Criteria 9

Elevation (m):

AreaSize (ha): 0

General Overview of the Site: A unique stand of riverine forest with the only known population of the endemic palm *Neoveitchia storckii* (an endemic genus). This population numbered less than 200 trees in 1972, and continues to decline as a result of clearing (Gorman & Siwatibau, 1975; Dahl, 1980). Recommended for protection in the 1980 Parks and Reserves Plan (Dunlap & Singh, 1980) and by Dahl (1980, 1986)

Physical Features of the Site: No information

Physical Features of the Catchment Areas: No information

Hydrological Values: No information

General Ecological Features: No information

Noteworthy Flora: No information

Noteworthy Fauna: No information

Social and Cultural Values: No information

Land Ownership / Tenure: No information

Land Uses: No information

Factors affecting the site's ecological values: No information

Conservation Measures Taken: No information

Conservation Measures Proposed: No information

Existing scientific research with references: No information

Current communication / public education programs: No information

Current recreation / tourism: No information

Management Authority: No information

References Cited: No information