

NATIONAL REPORT FOR FIJI
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1. Introduction

On March 2005, Cabinet had approved Fiji's accession to the Convention on Wetlands of International Importance. The formal accession was then forwarded to the Convention depository UNESCO and Fiji became a party to the Ramsar Convention in 2006.

The process of formally advancing Fiji's accession to the Convention was undertaken by a contingent of national government agencies, non-government organisations, local landowners, and a well-established eco-tourism venture, Rivers Fiji Ltd, which was later formed into a coordinating committee namely the Wetlands Working Group. Amongst its first tasks was to undertake field surveys, consultations and prepared the documentation for Fiji's first Ramsar Site.

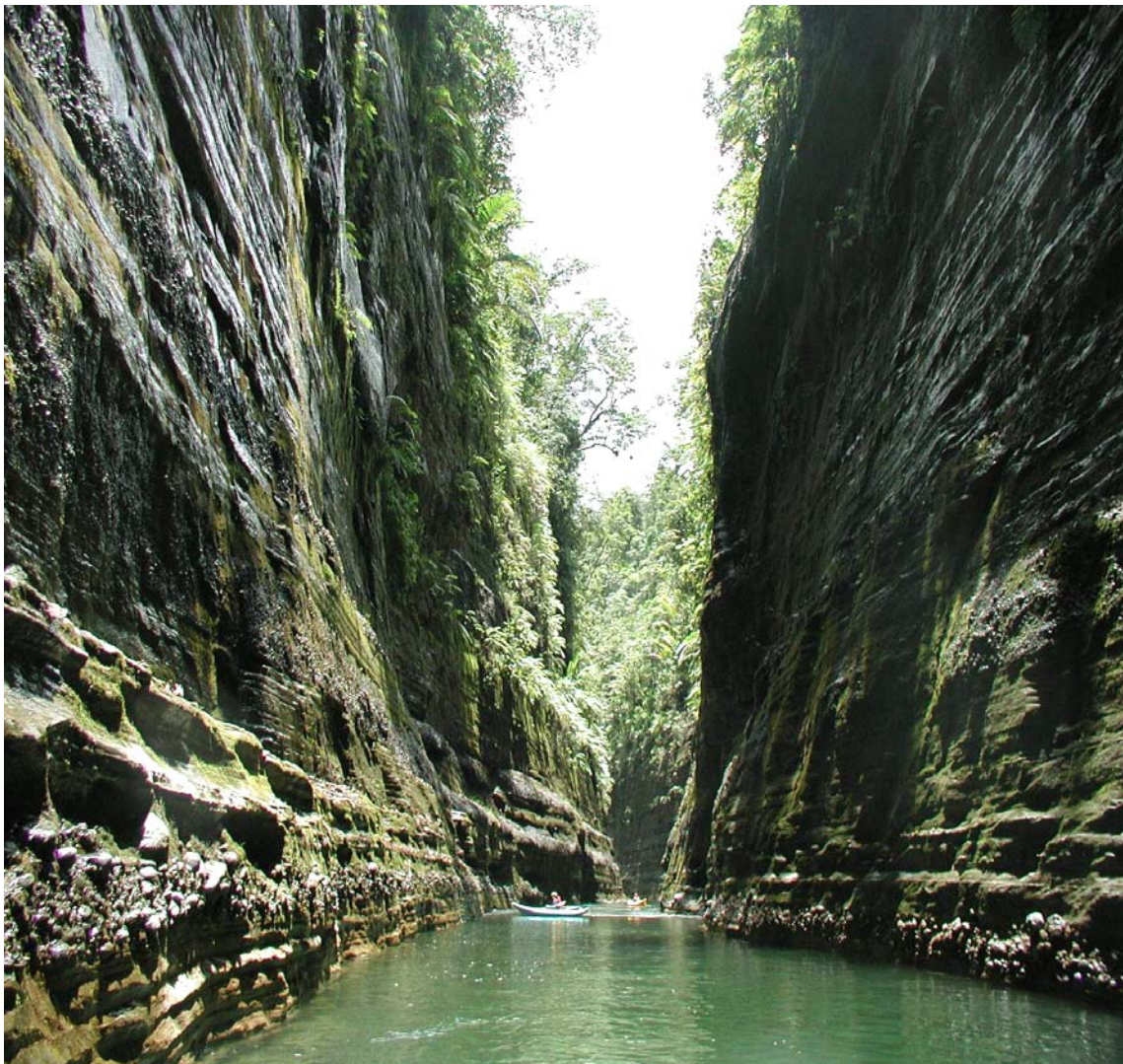
Since Fiji's accession in 2006, the appointment of Fiji's Wetland Steering Committee was undertaken to assist the Department of Environment in the implementation of the Convention. This paved the way for various scientific studies to be undertaken by NGOs and Institutions scientific team in identifying various fauna and flora found in many wetlands in Fiji. The outcomes of these studies were published and can be obtained from authors through the Department of Environment.

Upper Navua Conservation Area

Viti Levu, Fiji Islands

A

Wetland of International Importance



Contributors: Upper Navua Conservation Area local management committee, Department of Environment, Fijian Affairs Board, National Trust of Fiji, University of the South Pacific, Rivers Fiji Ltd, Wetlands International, Birdlife International, South Pacific Regional Herbarium, World Wildlife Fund, Wildlife Conservation Society, Environmental Consultants Ltd., Mainstream Environmental Consulting Pty Ltd.

Background Information on Fiji's Ramsar Site

2. Name of Site & Location

- 1.1 Name of wetland:** Upper Navua Gorge (Upper Navua Conservation Area - UNCA)
- 1.2 Country:** Fiji
- 1.3 Geographical coordinates:** Latitude 18 degrees 7 minutes .650 seconds (S)
Longitude 177 degrees 52 minutes .000 seconds (E)
Latitude 18 degrees 7 minutes .340 seconds (S)
Longitude 177 degrees 58 minutes .750 seconds (E)
- 1.4 Elevation:** Upper Reach 110 meters
Lower Reach 47 meters
- 1.5 Area:** 615 hectares including the river.
- 1.6 General location:** See Appendix 4. The Upper Navua Gorge and UNCA are located in the Province of Serua on the south-central side of Viti Levii. 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.

3. Overview

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 75 meters 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 (*Redigobius leverii* 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 (*Cytorhynchus nigrogularis*), Masked Shining Parrot (*Prosopeia personata*), 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 *Metroxylon vitiense*, which must be considered as endangered, as it is rapidly disappearing in its more accessible coastal habitats because of overutilisation. 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 Degeneriaceae 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.

4. Physical features

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 basalconglomerate. (*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.

5. 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 may be available for future flow description.

6. 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 biodiversity features are described in detail in Appendices and below in summary.

7. 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 (*Redigobius 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-faced Shrikebill (*Chytorhynchus nigrogularis*), Masked Shining Parrot (*Prosopeia personata*), 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*). Detailed lists of fauna including several additional endemic and noteworthy fauna are attached as Appendices 1 and 3.

8. 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 nerijfolius*. 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 overutilisation. The species is super-abundant in the gorge, having a population consisting of several thousands of individuals. In near future this population may constitute the last undisturbed natural populations of this endemic palm. A detailed account of vegetation of UNCA is in Appendix 2.

The site also contains the endemic family Degeneriaceae 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 pallidiflorum*, *Aglaiia parksii*, *Geissois superba*.

9. 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.

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. 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 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. Additionally 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.

10. Land tenure, jurisdiction and management arrangements

10.1 Land 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.

10.2 Jurisdiction

The land is managed on behalf of the native landowners known as (mataqali) by the Native Land Trust Board (NLTB). The NLTB issues leases on behalf of the landowners to interested parties such as Rivers Fiji. The land leased by Rivers Fiji was designated "Native Land Reserve" and required special consideration by the NTLB and members of its board to be re-designated so Rivers Fiji could establish the UNCA. Now with the lease in hand Rivers Fiji manages the land on behalf of the Native Land Owners and in conjunction with the NLTB for the purposes of conservation and tourism.

10.3 Management arrangements

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.

11 Current land use

11.1 On the site

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.

11.2 In the surrounding areas/catchments

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 vi-apple (**wi**)(*Spondias dulcis*), Malay apple (**kavika**)(*Syzygium malaccense*) and a wide range of other culturally useful 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 favoured 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 of 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 of the 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 modern cash economy. Of particular importance are a number of named varieties of wild yam (**tivoli, rauva and tikau**), birds (**manumanu vuka**), fruit bats (**bekwa**), edible cicadas (**nanai**) and the wild pig (**vuaka ni veikau** or **vore**).

12. Threats to the site

12.1 At the site

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 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 naturally disturbed through flooding. The common bamboo has already spread throughout the river and it is probably too late for any control measures.

12.2 Around the site

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.

13. Conservation measures

13.1 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."

A management and permit plan has been developed for the UNCA. This plan is currently being updated to incorporate recent biological survey information. Suggestions are being made to align the management plan with Ramsar Management Planning guidelines.

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.

13.2 Conservation measures proposed but not yet implemented

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.

Rivers Fiji also plans to demarcate the entire boundary of the UNCA with the assistance of the Department of Forestry, NLTB and other available resources. It was not done in previous years as it is such a large area to map and mark, though due to extreme circumstances, Rivers Fiji must mark the area to keep impeding logging companies out.

14. Scientific and education activities

14.1 Scientific activities

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.

The results of these surveys are summarized for the purposes of this Ramsar Information Sheet and presented in Appendices 1-3.

14.2 Education activities

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

15. Current recreation and 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 three 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.

16. Benefits to the Fijian Community and the Landowners

16.1 Donations & Building projects

Over the past 10 years whilst operating the number one day tour in the country, Rivers Fiji has taken the time to donate it's resources and help, whether monetary or otherwise to schools, police posts, churches, village projects or functions. Have handled the delivery and distribution of donated books and medical supplies, clothing, and shoes. We have built classrooms, dug water lines, constructed washrooms, installed village radios, and so much more on the grassroots level. These villages are our homes, these people are our family.

16.2 Sustainable Tourism as a viable income

Rivers Fiji has built a company that gives the local communities other viable business opportunities other than logging or mining. A sustainable option that allows landowners to lease their beautiful land for the benefit of those who come to view it as well as to the biodiversity of Fiji's interior. Over the past ten years, on both of our rivers, we have paid an approximate sum of 360,000FJD to the various landowning units and villages where we operate and lease for conservation. An amount that has helped countless families and several villages survive and live a more fruitfull life. Rivers Fiji continues to operate and shall benefit local communities for as long as the company exists.

16.3 Training & Employment

Rivers Fiji has trained an employed over twenty young men from the various mataqali along the river corridor where we operate. Currently, there are 10 guides from various villages along our two rivers. Through Rivers Fiji and our conservation area, they gain new and exciting skills, attain proper techniques for working on challenging rivers, the opportunity to meet people from all over the world and interact with them, and a chance to make something of themselves and become a productive member of society here in Fiji.

17. Recommendations regarding proposed protection of the

Gorge:

1. The area surveyed constitutes an ideal wetland protected area because it is an excellent example of Fiji's river flora (vegetation types 1, 2 and 3). As mentioned, this is, perhaps, the most well-developed example of these vegetation types seen by the authors. 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 overutilisation. The species is super-abundant in the gorge, having a population consisting of several thousand individuals. In near future this

population may constitute the last undisturbed natural populations of this palm.

2. Logging and the associated siltation of the river is a major concern. GTZ may be able to assist in this matter. Our lease states a lateral 200m must be kept free from logging or any other unauthorized development, though logging continues to happen within the conservation area with no assistance from the Forestry Department to stop it. The conservation area must be marked and demarcated immediately to ensure further encroachment doesn't continue.
3. In addition, as villagers are carrying out the logging themselves, it is our recommendation to conduct educational workshops ensuring that logging is more selective (less trees removed) and a greater buffer zone around rivers is enforced by villagers.

18. Background of damaged area

Over the past 7 years, since the inception of the Upper Navua Conservation Area, there has been relationships with various logging contractors to make them all aware of the Rivers Fiji lease and its boundary. We even had two of the local logging companies build our road and the footbridge along our trail. With all that said, in the past two years logging has commenced within our established and legally leased area. There are 9 mataqali involved within the conservation lease and each are paid the lease fees as well as a goodwill of \$2 per person on all trips within the conservation area.

In Mataqali Cawanisa, on river left, there has been an encroachment of 150m within the boundary. That means they are only 50m from the river. The mataqali owns 27% of the area within the total lease and is an integral part of the sustainability of the conservation area. This land was logged by Jamal Investments over the past year and a half. They were notified of their encroachment yet continued to log. NLTB suspended their lease, yet the mataqali is in the process of hiring another contractor. We are looking for compensation for the trees cut as well as serious charges brought against Jamal Investments.

In another mataqali of Sauturaga Nokorovou, Nur Ahmed Logging Company of Yarawa is currently logging two coops right next to the river. Currently, they are 100m from the boundary but they have plans on continuing further if the boundary is not marked. The issue here is that Forestry does not have the resources to monitor or deal with the issue. A recent meeting with Forestry has identified that in every logging licence it states that the logging company must mark their coop boundary. This would in hand mark the conservation boundary at the same time.

19. Immediate Actions

A recent meeting was initiated by the Department of Environment (National Secretariat for Ramsar) as a resolution of the Ramsar Working Group meeting on the 25th March 2008. The meeting brought together representatives from NLTB, Department of Forestry, and Rivers Fiji to discuss issues surrounding Fiji's Ramsar Site. The objective of the meeting was to identify immediate actions by stakeholders as a stepping stone to resolve the issue.

The meeting unanimously resolved that because it is a National Site of Importance in terms of conservation, the site should be protected as Fiji's Ramsar Site. Immediate actions were then identified by the various groups which included:

- Department of Environment to conduct a consultation round with NLTB Board members on the importance of the Ramsar Convention and the facilitation role of Rivers Fiji in Fiji's Ramsar Site,

- Rivers Fiji with the Ramsar Committee to secure funding and technical assistance for the demarcation of the areas by Rivers Fiji with Landowners,
- Forestry Department to visit the sites and ascertain the encroachment as claimed by Rivers Fiji, and review the logging licenses of companies who have already crossed the boundary, and
- Identification of rehabilitation options for the logged areas with the stakeholders concerned.

20. Brief Updates on Wetland Activities

1. Wetlands International-Oceania

Since 2001 Wetlands International has produced relevant publications that are contributing to understanding the values of wetlands in Fiji (Appendix . They have been primarily involved in the inventory of freshwater wetland of Fiji including every major catchment areas in the country. In addition, they have also been involved in the training of communitieis, NGO partners, USP students, FIT students, government officers and others in inventory and management of wetlands (particularly rivers and nearshore reefs). This has raised the knowledge of freshwater fishes in the country with the discovery of 7 new species endemic to Fiji and 10 species of new records. The most comprehensive listing of freshwater and estuarine fishes in Fiji has been published on the WI-O website (www.wetlands.org).

Wetlands International-Oceania has also been involved in public awareness through participation in public meetings and also the production of three sets of stamps with Post Fiji. WI-O is currently engaged in the Fiji EBM project that involves a large amount of inventory and awareness work in Vanua Levu in particular.

Wetlands International-Oceania is also looking at ways to get government and community-based protection on estuarine and mangrove areas, which is their next plan of work.

Wetlands International-Oceania is an active member of the National Wetlands Working Committee and was involved in the setting up of the Upper Navua Ramsar Site. Aaron Jenkins (WI-O) and Batiri Thaman did a review of the Management Plan and Permit Plan of the UNCA which suggested actions on a plan which conforms to the management planning for Rasar sites and other wetlands.

2. NatureFiji – Mareqeti Viti

NatureFiji-Mareqeti Viti with its partners, the national Trust of Fiji and the Department of Environment are undertaking a collaborative project which aims at identifying and then implementing sustainable and reasonable measure that will protect and conserve the endemic Fijian Sago Palm, and the same time provide an enhanced livelihood for landowners. The Sago Palm is currently being threatened by drainage and sub-division of the area for agricultural purposes, tourism industry who use the leaves for thatched 'bures', and a source of livelihood for the communities. The strategy is to involve stakeholders in trying to implement a complete, comprehensive and sustainable approach to conserving the species. The Fiji Sago Palm is an endemic species which survives best in wetland areas and is currently restricted to SE Viti Levu. A small population of Sago is protected up in the Navua River as part of a RAMSAR site.

3. WWF Fiji Country Programme

WWF has undertaken ecosystem based projects mainly on Vanua Levu facilitating community needs on how to manage their resources. WWF has initiated a reforestation program of logged areas at the Dreketi River and Naselevu and maintenance of buffer zone. They had also undertaken satellite tagging of turtles in conjunction with Dept. of Fisheries, Mamanuca Environment Group and IAS, USP.

4. Fiji Locally Managed Marine Area (FLMMA)

FLMMA network, formed in 2001, is a collaborative partnership between communities, government agencies, NGOs and institutions supporting locally managed marine areas. The network addresses some of the pressing environmental issues such as overfishing, cutting down of mangroves, overharvesting of corals, pollution, and lack of alternative livelihood options in the country. FLMMA activities over the years have included:

- Developing 'Qoliqoli' Management Plans & Monitoring Plans with communities
- Improving conservation tools and processes
- Skills development and Training
- Awareness raising

Work on LMMA begun in 1997 with the Veratavou project. By September 2007, 205 sites have been secured as LMMA sites, 116 of these are 'qoliqolis'. This has engaged 187 districts in Fiji compared to 2 in 1997. Some of the challenges faced by FLMMA include poaching and enforcement by trained fish warden, conflicts between conservation and community development needs, integrating the FLMMA work into existing national plans and activities, and the sustainability of the LMMA (qoliqoli) activities.

5 Birdlife International

The first successful rat eradication program has been declared in Fiji for the island of Vatu-i-ra. Rats were eradicated by a team led by BI and Pacific Invasive Initiative. BI's Seabird Island Project is ongoing. The project funded by Packard Foundation has already surveyed a total of 10 seabird islands. Rat eradication is planned for later this year 2008 where four(4) major seabird colonies are targeted. The eradication of rats for the other islands will depend on availability of funds upon completion of the 4 seabird areas.

6 IAS/USP

IAS's support on conservation activities with other groups has been ongoing. The latest saw the facilitation of a conservation lease for Sovi Basin. IAS is currently working with Conservation International in looking at a bigger area eg. Wabu Catchment Area in achieving something similar to Sovi Basin.

IAS/USP has been involved with NatureFiji in the Northern Lau Group undertaking surveys and assessments on areas that haven't been assessed thoroughly. Sites have been discovered during the trip which could be classified as Ramsar sites and could generate revenue for the community eg. Naqilaqila group of islands.

USP had also worked with Rivers Fiji on the background paper for the Ramsar Site.

21. Issues and challenges

- Lack of human resources to allow for full and effective implementation of the international environmental conventions that the country has joined, including now the Ramsar Convention
- Lack of assistance and capacity to conduct awareness and training on the Ramsar Convention and why wetlands should be protected to various government departments to enhance capacity building in the public service and communities and public at large.
- Identify appropriate ways to streamline implementation of the Ramsar Convention in Fiji with limited resources.
- No measures in place for the process of funding acquisition for particular projects within the project timeframe.

22. References

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

23. Compilation Details

This is an updated report compiled by Eleni Tokaduadua of Department of Environment and Jason Hart of Rivers Fiji Ltd. for the purpose of the 4th Oceania Regional meeting for Ramsar COP10 which is to be held in Samoa on 10-11th April, 2008.

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Appendix 1.

Fishes of the Upper Navua River Conservation Area (UNCA)

Researched and compiled by:
Aaron Jenkins, Wetlands International – Oceania
David Boseto, Institute of Applied Sciences, University of the South Pacific

The following list of fishes were collected and observed by the authors on the 10th and 11th August, 2003 within the Upper Navua River Conservation Area (UNCA). We currently recognize 13 species within UNCA; 12 native and one introduced species. Of these, 2 species are endemic to the Fiji islands and one is an undescribed species. This should be regarded as a preliminary list of ichthyofauna for the upper Navua river system.

The phylogenetic sequence of the families appearing in this list follow the system that is used by the major Australian museums and approximates proposed in Nelson's *Fishes of the World* (2nd edition, 1984, John Wiley and Sons). Genera and species are arranged alphabetically within each family.

Text for each species includes a series of annotations, each separated by a semicolon. These annotations pertain to general habitat, detailed habitat, known altitudinal range, general activity mode, social behavior, major feeding type, food items, reproductive mode, maximum size, general distributional range and additional comments pertinent to the present survey. The length is given as standard length (SL) for most species, which is the distance from the tip of the snout to the base of the caudal fin. Total length (TL) is given for a few fishes which do not have a clearly defined caudal fin (eels for example).

Anguillidae – Freshwater Eels

***Anguilla marmorata* (Quoy & Gaimard, 1824)- Giant mottled eel**

Fresh water; creeks and rivers; up to at least 1000m elevation; cryptic; solitary; carnivore; fishes, crustaceans; spawns pelagic eggs; 60 cm SL; Indo-west Pacific. Several seen during survey; probably more common than observations suggest due to its cryptic habits; an additional species reported by locals.

Muraenidae – Moray Eels

***Gymnothorax polyuranodon* (Bleeker, 1853) - Freshwater moray**

Lentic and lotic freshwater, estuary and marine habitats; creeks, rivers, inshore-reefs, mangroves; usually found within 20-30 km of the sea at a maximum elevation of about 30-40 m; cryptic; solitary; carnivore; fishes, crustaceans; spawns pelagic eggs; 92.5 cm TL; Indo-west Pacific. Only one seen during survey at an unusually high elevation at 58m.

Ophichthyidae – Snake Eels

***Lamnostoma kampeni* (Weber & de Beaufort, 1916) – Freshwater snake eel**

Fresh water; creeks and rivers; below 50m ; cryptic; usually buried in sand, solitary; carnivore; fishes, crustaceans; spawns pelagic eggs; 41 cm TL; Indo-west Pacific. Few seen during survey; probably more common than observations suggest due to its cryptic habits.

Kuhliidae – Flagtails

***Kuhlia marginata* (Cuvier, 1829) – Spotted Flagtail**

Fresh water; creeks and rivers; below about 150 m elevation; diurnal midwater; forms aggregations; carnivore; insects and larvae, crustaceans, fishes; spawns pelagic eggs; 40 cm SL; Western Pacific; commonly seen and collected in clear reaches.

Kuhlia rupestris (Lacepède, 1802) – Rock Flagtail

Fresh water; creeks and rivers; below about 150 m elevation; diurnal midwater; forms aggregations; carnivore; insects and larvae, crustaceans, fishes; spawns pelagic eggs; 45 cm SL; Western Pacific; very commonly seen and collected in clear reaches.

Gobiidae – Gobies

Awaous ocellaris (Broussonet, 1782) – Roman nose Goby

Fresh water; creeks and rivers; below about 150 m elevation; rests on bottom; solitary or in groups; omnivore; algae and small crustaceans; parental care of demersal eggs; 11 cm SL; Indo-Australian Archipelago. Uncommonly seen during survey.

Redigobius leveri (Fowler, 1943) – Lever’s Goby

Freshwaters; creeks and rivers; below about 100 m elevation; rests on bottom; solitary or in groups; carnivore; benthic invertebrates; parental care of demersal eggs; 4.5 cm SL; **Fiji islands endemic**. Common in clear reaches and sidestreams during survey.

Schismatogobius vitiensis (Jenkins and Boseto, 2003) – Orange-spotted Scaleless Goby

Fresh water; lowland creeks and rivers ; below about 50 m elevation; rests on bottom; often buried in sand and pebbles, solitary or in small groups; carnivore; insects, larvae; presumed amphidromous; 41 mm SL; **Fiji Islands endemic**.

Sicyopterus sp. – Orange-tailed Goby

Fresh water; lowland creeks and rivers; below about 50 m elevation; rests on bottom; solitary or in groups; herbivore; filamentous algae growing on rock surfaces; hatching and larval stage occur at sea, postlarval stage to adult in freshwater; 85 mm SL; **an undescribed species** likely to be a Fiji endemic, most closely resembles *S.lagocephalus* (Pallas, 1770) but with several meristic differences.

Stenogobius genivittatus (Valenciennes, 1837) – Chinstripe Goby

Fresh water and estuaries; mangrove estuaries, creeks and rivers; below about 30 m elevation; rests on bottom; solitary or in small groups; mainly carnivorous; benthic crustaceans, insect larvae; benthic spawner; parental care of demersal eggs; 18 cm SL; Indo-West Pacific. Uncommon in survey.

Eleotridae - Gudgeons

Eleotris fusca (Schneider & Forster, 1801) - Dusky sleeper

Fresh and brackish waters; mangroves, tidal creeks, and lowland streams below about 20 m elevation; rests on bottom; solitary or in groups; carnivore; insects, crustaceans, and small fishes; parental care of demersal eggs; 26 mm SL; Indo-Australian Archipelago. Common in slow shallow reaches.

Eleotris melanosoma (Bleeker, 1852) - Broadhead sleeper

Fresh and brackish waters; mangroves, tidal creeks, and lowland streams below about 20 m elevation; rests on bottom; solitary or in groups; carnivore; insects, crustaceans, and small fishes; parental care of demersal eggs; 26 cm SL; Indo-Australian Archipelago. Common in slow shallow reaches.

Introduced species

Cichlidae – Cichlids

Oreochromis mossambicus (Peters, 1852) – Mozambique tilapia

Fresh and brackish waters; blind estuaries, coastal lakes, warm, weedy pools of sluggish streams, canals, and ponds; below at least 58 m; mainly diurnal; may form schools; omnivorous, feeds on almost anything from algae to insects; can be reared under hypersaline conditions; juveniles are carnivorous, adults tend to be herbivorous; exhibits considerable plasticity in its feeding habits as well as in its reproductive biology; 39 cm SL; is the most widely introduced freshwater fish in the Pacific; used to control mosquitoes and aquatic weeds it is now considered a pest competing for food with native fish and birds; native to lower Zambezi in East Africa; Fijian population came from Malaysia in 1954 for aquaculture; well established pretty much everywhere in Fiji ; two juveniles 6 cm SL collected at 58 m well into the upper Navua catchment.

Appendix 2.

PRELIMINARY REPORT ON THE VEGETATION OF THE UPPER NAVUA CONSERVATION AREA (UNCA)

G. Keppel and R. R. Thaman

This report includes our preliminary observations on the vegetation in the Upper Navua Conservation Area (UNCA) along the Navua River Gorge between Nabukelevu and Wainadiro villages during our trip by inflatable rafts on Saturday, 6th April 2003. The results are limited in 2 major aspects. We are not very well versed with lower vascular plants and mosses and liverworts (species of *Marchantia*, common liverworts, and mosses are a common components of the riverside vegetation. The other limitation is related to the landscape. Because of the steep cliffs, the vegetation on top of the cliffs could not be studied and we had to rely solely on observations from the river. Also, this report deals with the upper and middle reaches of the Navua Gorge, and not with the lower reaches near Wainadiro were grazing areas, shifting agricultural gardens, extensive areas of disturbed weedy vegetation and other signs of human habitation are common.

The vegetation of the Navua Gorge can be divided into 4 major categories:

1. Ultimate Riparian Vegetation (adapted to fast-flowing rivers)

This consists of plants that share short stature, narrow leaves and flexible stems as adaptations to withstanding regular flooding in fast-flowing rivers. The assemblage includes all of the typical native river plants, including *Acalypha rivularis*, *Ficus bambusifolia*, *Syzygium seemanianum*, *Ophiorrhiza* cf. *laxa* and the water fern (Still have to find out what it is). This riparian vegetation this well developed and includes all of Fiji's reported river plants. In addition to these, the conifer *Podocarpus neriifolius* and the native reed *Miscanthus floribundus* are common native components. In addition the introduced *Piper aduncum*, *Vernonia cinera* and *Arundo donax* are locally common.

2. River Bank Vegetation

The lower slopes and banks of the river are areas that are presumably occasionally flooded during times of very high rainfall and river flow. These areas are dominated by the sago palm *Metroxylon vitiense*, *Dillenia biflora*, *Bischofia javanica*, *Trichospermum* sp., *Barringtonia edulis* and the introduced bamboo (*Bambusa vulgaris*). Occasionally the native bamboo (*Schizostachyum* sp.)

and *Pongamia pinnata* are also found. Along the lower slow-moving reaches of the river the beach hibiscus (*Hibiscus tiliaceus*) and *Dellinia biflora* are found along the river.

3. River Gorge and Cliff Face Vegetation

Along the deeper parts of the Navua River Gorge, the river is bounded by steep, almost vertical cliff faces. This vegetation, although including some of the same species, as 1 and 2 above, is dominated by hanging ferns, with occasional orchids, namely the Pacific ground orchid (*Spathoglottis pacifica*). A major feature of this formation are the stands of sago palms that are seen along the tops of the cliffs.

4. Lowland Rainforest

This is found on the upper slopes of the gorge cliffs and the adjacent areas, along both the main river and tributaries. It seemingly includes a rich assemblage of native forest plants, including terrestrial and epiphytic ferns, orchids, numerous high-climbing vines and lianas, other understory and subcanopy plants, many of Fiji's most important large trees and many of Fiji's endemic forest plants and animals. This vegetation needs further detailed investigation, preferably by access from Nabukelevu Village, as most of this area is inaccessible from the river because of the steepness of the cliffs/slopes. In many places the sago palm, *Metroxylon vitiense* is very common and *Endospermum macrophyllum* is the dominant emergent large tree. Other species observed include *Serianthes melanesica*, *Canarium* sp., *Geissois* sp. and *Alstonia* sp. A wide range of ferns, including tree ferns (*Cyathea* spp.) and bird's-nest ferns (*Asplenium* and *Drynaria* spp.), a common, very scenic components. There is also a rich epiphytic flora including a wide range of orchids and other attractive epiphytic plants, and a very large range of high-climbing vines and lianas, such as freycinetia (*Freycinetia storkii*), an attractive high-climbing vine in the pandanus family, and the taro vine (*Epipremnum pinnatum*). To adequately describe this vegetation type a detailed investigation is required.

Recommendations regarding proposed protection of the gorge:

1. The area surveyed constitutes an ideal wetland protected area because it is an excellent example of Fiji's river flora (vegetation types 1, 2 and 3). As mentioned, this is, perhaps, the most well-developed example of these vegetation types seen by the authors. 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 overutilisation. The species is super-abundant in the gorge, having a population consisting of several thousand individuals. In near future this population may constitute the last undisturbed natural populations of this palm.

2. Logging and the associated siltation of the river is a major concern. As villagers are carrying out the logging themselves, my recommendation is to conduct educational workshops ensuring that logging is more selective (less trees removed) and a greater buffer zone around rivers is enforced by villagers. GTZ may be able to assist in this matter.

3. 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. In addition, the species is an attractive site (good for ecotourism) and very useful to native Fijians (constant supply of new propagules), who use it for construction, handicrafts and for making bamboo rafts (**bilibili**).

Appendix 3

Relevant Publications on Wetlands in Fiji by the Wetland International-Oceania

- Jenkins, A.P. and Bennett G. 2007. Fiji's Freshwater Gobies. April stamp release by Post Fiji
- Jenkins, A.P., Boseto, D. and R. Watson. 2007. Freshwater fishes from Fiji of the subfamily Sicydiinae, with descriptions of three new species (Teleostei: Gobioidae) and notes on their ecology. Ichthyological Exploration of Freshwaters. (in press)
- 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, Vol 61 :1, 141-144.
- Jenkins, A. P., Mailautoka, K., Raikabula, A., Naisililil, W. 2007. Ichthyofauna and water quality of two Bua catchments. Wetlands international-Oceania. 19ppgs.
- Jenkins, A.P. and Bennett G. 2006. Anemonefishes. December stamp release by Post Fiji.
- Jenkins, A.P., Boseto, D. and K. Koto. 2006. Aquatic fauna and water quality of five river catchments in Macuata Province. Wetlands International. 21ppgs.
- Jenkins, A.P., Boseto, D. 2006. A checklist of freshwater and brackish water fishes of the Fiji Islands. www.wetlands.org/Oceania
- Jenkins, A.P. 2006. A review of seven freshwater ecoregions in Oceania based on diversity of freshwater ichthyofauna: Fiji, Solomon Islands, New Caledonia, Vanuatu-Santa Cruz, Lord Howe Island, Norfolk Island and the Hawaiian Islands Report to World Wildlife Fund -US. 12ppgs.
- 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
- 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

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. 2004. Freshwater fishes of Waisai Creek and allied hot springs systems. Wetlands International, Suva, Fiji Islands. 20pp.

Jenkins, A. 2003. The status of mangroves: Global, Asia-Pacific and the Pacific islands region. Proceedings of the Pacific Regional Workshop on Mangrove Wetlands Protection and Sustainable Use, the University of the South Pacific, Marine Studies Facility, Suva Fiji, June 12-16, 2001. Apia Samoa: SPREP, 2002. iv 221 pgs.

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., 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 Bennett G. 2002. Freshwater fishes of Fiji. April stamp release by Post Fiji

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 "Freshwater Fishes of Fiji: advanced taxonomy, identification and applications for wetland management." Wetlands International-Oceania, University of the South Pacific.