ECOSYSTEM-BASED MANAGEMENT PLAN

WAINUNU DISTRICT

VANUA LEVU, FIJI

Citation: WCS (2012) *Ecosystem-Based Management Plan: Wainunu district, Vanua Levu, Fiji*, Wildlife Conservation Society, Suva, Fiji.

NOTE: This management plan may be amended from time to time. To obtain a copy of the current management plan, please contact:

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ENDORSEMENT

On this day, , at in the District of Wainunu, Bua Province, Vanua Levu, in the Republic of Fiji Islands, we, the traditional leaders of Wainunu, endorse this management plan, and urge the people of Wainunu to make every effort to ensure its effective implementation.

Tui Wainunu, Ratu Orisi Baleitavea

Vunivalu Nakorolevu

Turaga ni Yavusa Nalomate

Turaga ni Yavusa Tanidamu

Turaga ni Yavusa Namuana i Cake

Turaga ni Yavusa Maururu

Turaga ni Yavusa Volivoli

Turaga ni Yavusa Nabutubutu

Turaga ni Yavusa Nukudamu

Turaga ni Yavusa Dawacumu

Turaga ni Yavusa Dawadigo

Chairman WRMC, Mosese Ratagau

Turaga ni Yavusa Naniudrau

Turaga ni Yavusa Nakawakawa

ACKNOWLEDGMENTS

The Wainunu Resource Management Committee wishes to recognise the vision and leadership of the chiefs of Wainunu district and celebrate their commitment to sustainable management of Wainunu's precious ecosystems for the benefit of present and future generations.

The people of Wainunu have given freely of their time and expertise to support the conservation and sustainable use of the district's natural resources. They continue to ensure that management decisions are informed by the best available knowledge and their ongoing support is gratefully acknowledged.

The adoption of this management plan is a significant milestone for ecosystem-based management at a local, national and regional level. It is made possible by the contributions of a diverse range of stakeholders, including:

- Wildlife Conservation Society
- Kubulau Resource Management Committee
- Fiji Locally Managed Marine Area Network
- Bua Provincial Office
- Department of Environment
- Department of Fisheries
- Department of Forestry
- Ministry of Agriculture (Land Use Department)
- Ministry of Health
- Environmental Law Association
- iTaukei Land Trust Board
- iTaukei Lands and Fisheries Commission
- Wetlands International-Oceania
- Peace Corps
- Bureau of Statistics
- David and Lucile Packard Foundation
- U.S. National Oceanic and Atmospheric Administration Coral Reef Conservation Program
- John D. and Catherine T. MacArthur Foundation
- Walt Disney Friends for Change Program

The continuation and further expansion of partnerships is essential to achieving our aims. The Wainunu Resource Management Committee is committed to leading this process and would like to thank its leaders, communities and wider partners for efforts towards shared goals.

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1 INTRODUCTION

This management plan seeks to enhance the ecological value and resilience of terrestrial, freshwater, estuarine, coastal and marine ecosystems in Wainunu district and adjacent coastal waters. Local communities are central to the sustainable management of these ecosystems and the plan aims to help them to address forthcoming challenges, including those related to climate change impacts. The planning process has been informed by extensive scientific assessments, as well as incorporation of local and traditional ecological knowledge. It is anticipated that the plan will be reviewed and amended periodically to reflect monitoring results and evolving management priorities (**Figure 1.1**).

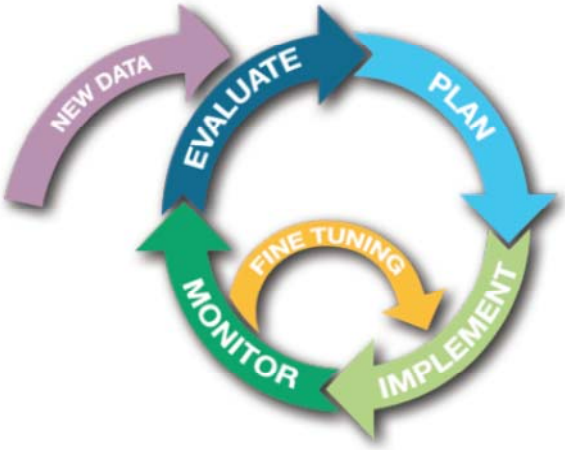


Figure 1.1 The cycle of adaptive management.

The management plan has been prepared on behalf of the Wainunu Resource Management Committee (WRMC), based on community and stakeholder consultations undertaken between November 2010 and February 2012. In particular, the management plan largely reflects the outcomes of the *Wainunu Ecosystem-Based Management Planning Workshop* (Daria village, 24-26 November 2011), the *Wainunu Management Support Workshop* (Nakawakawa village, 28-29 February 2012) and community consultations in between.

Above: Participants at the Wainunu EBM Planning Workshop in Daria, 26 November 2011

The key components of this management plan are:

- a **description of the management area**, including district and qoliqoli boundaries, demographics, habitat descriptions, resource tenure, resource use and protected area boundaries;

- discussion on **habitat management issues** for terrestrial, freshwater, estuarine, coastal and marine ecosystems, including habitat descriptions covering flora and fauna, endemic and endangered species and species of cultural and economic significance;

- a management **implementation plan**, including:
    - a discussion of **key threats** and **underlying causes** of those threats for each habitat;
    - **management rules** for each habitat, including national laws and community rules;
    - proposed **management activities** for each habitat; and
    - **best practice** management recommendations for each habitat.

- a description of key **management institutions** and **external stakeholders**;

- an explanation of **management roles and processes**, including preparation, implementation, amendment and review of the management plan; and

- an overview of **compliance and enforcement issues**.

Above: Workshop participants identify priority issues and areas for conservation, 26 November 2011

2 ECOSYSTEM-BASED MANAGEMENT

2.1 ECOSYSTEM-BASED MANAGEMENT PRINCIPLES

This management plan seeks to promote an integrated approach to management of terrestrial, freshwater, estuarine, coastal and marine ecosystems. In particular, the plan reflects a community-driven, ecosystem-based management approach.

Ecosystem-based management is 'an integrated approach to management that considers the entire ecosystem, including humans'[1]. This aims to maintain ecosystems in a healthy, productive and resilient condition so that they can meet human needs into the future. For island communities, ecosystem resilience is particularly important for recovery from strong impacts related to climate change.

What is an ecosystem?

An ecosystem includes all of the plants, animals, microbes, soil, air and water within a physical space and the interactions between them. Humans are a central part of both marine and terrestrial ecosystems.

The linkages within and between ecosystems arise from biological interactions (for example, seabirds hunting for marine fish to feed their offspring) and physical processes (for example, sediments transported downstream by river networks).

In particular, ecosystem-based management:

- emphasises connectivity within and between systems, such as between land and sea (**Figure 2.1**);
- emphasises the protection and restoration of ecosystem structure, function and key processes;
- focuses on a specific ecosystem and the range of activities affecting it; and
- integrates ecological, social, economic, and institutional perspectives.[2]

Use of land and resources by humans may result in significant alteration of ecosystem structure, function and processes, including connectivity within and between ecosystems (**Figure 2.2**). Modification of ecosystems may reduce their health, productivity and resilience, and must be managed to ensure ongoing availability of ecosystem services.

Ecosystem-based management has objectives and targets that:

- focus on maintaining the natural structure of ecosystems and their productivity;
- incorporate human use and values of ecosystems in management of resources;
- recognise that ecosystems are dynamic and constantly changing;
- are based on a shared vision of stakeholders; and
- are based on scientific and local knowledge, adapted by continual learning and monitoring.[3]

[1] *Scientific Consensus Statement on Marine Ecosystem-Based Management*
[2] *Scientific Consensus Statement on Marine Ecosystem-Based Management*
[3] Grieve and Short, WWF EBM Toolkit

Ecosystem-Based Management emphasises connectivity within and between systems, such as between land and sea, with humans as a key component.

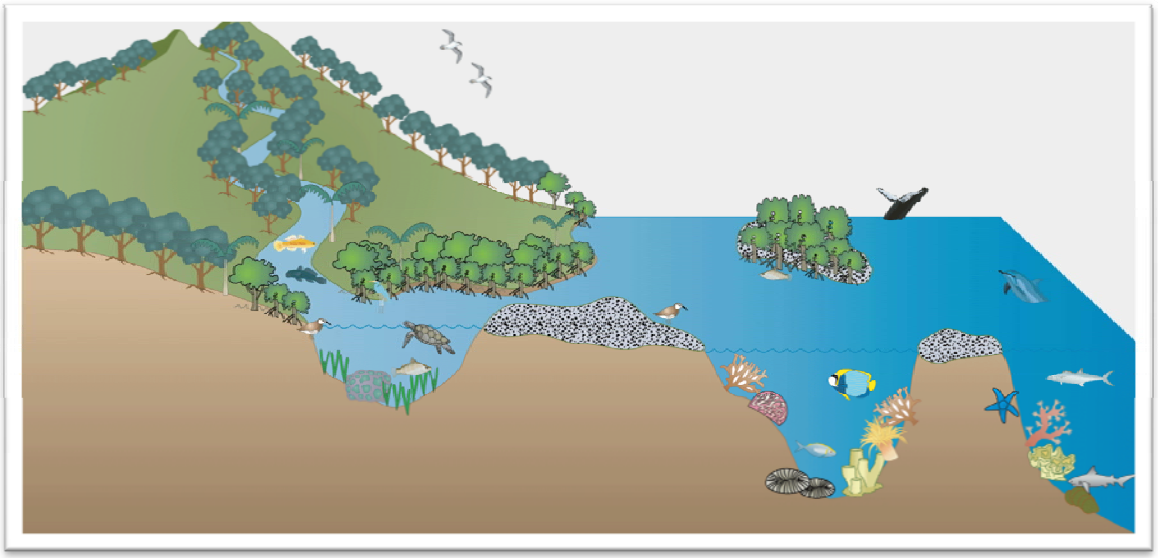


Figure 2.1. Schematic diagram of healthy connectivity between adjacent terrestrial, freshwater, coastal and marine ecosystems[4]

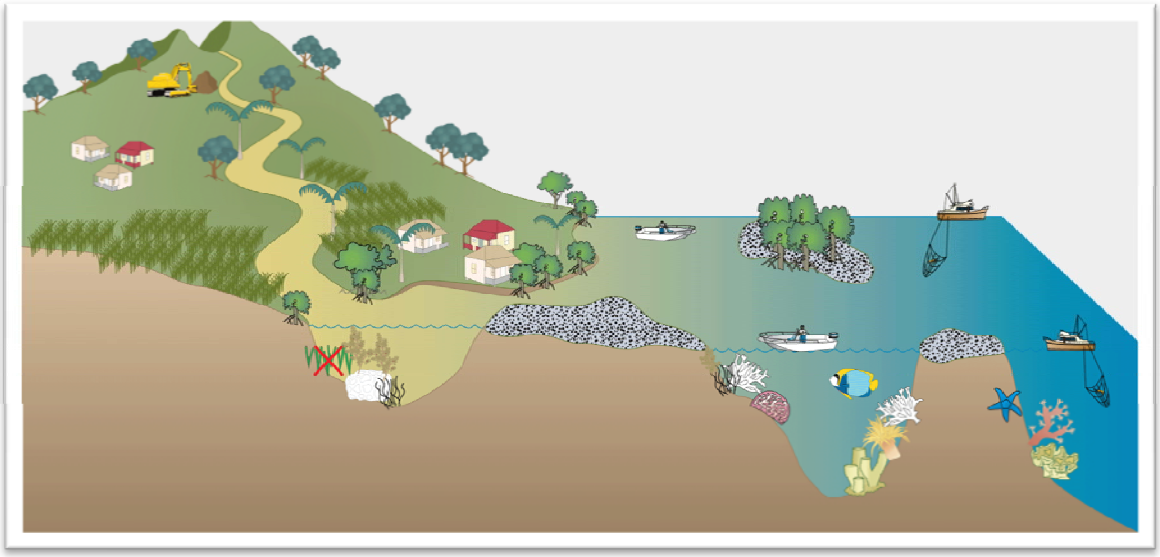


Figure 2.2. Schematic diagram depicting interruption to ecosystem connectivity due to human activity

[4] Symbols courtesy of the Integration and Application Network (http://ian.umces.edu/symbols).

2.2 ECOSYSTEM-BASED MANAGEMENT IN WAINUNU

Ecosystem-based management in Wainunu is community-driven and centres around a shared vision of ***'healthy people, processes and systems'***. The overarching goal of ecosystem-based management in Wainunu is 'preservation of the functional integrity of Wainunu's ecosystems, from ridge to the reef, through community-based management'.

The process of developing this plan has involved representatives from across the district. Participants have outlined their shared aspirations for the ecosystem-based management process to:

'*Maintain or increase biodiversity and natural resources and stop practices that damage the environment*'; and

'Care for the environment through good local stewardship, generating income sustainably whilst ensuring a plentiful supply of food and water'.

The following key messages have been identified for ecosystem-based management in Wainunu:

- ***Inland and coastal communities need to manage their actions and resources together.***
  Connectivity between ecosystems makes each biome susceptible to degradation from factors arising in adjacent areas. For example, the health and resilience of coral reef ecosystems may be affected by clearing and burning in coastal catchments. Cooperation between inland and coastal communities is a central feature of ecosystem-based management in Wainunu.

- ***Ridge to reef management protects habitats for all stages of life.***
  Many organisms move between habitats during phases of their lives. For example, key food fish species in Wainunu move between marine, estuarine and freshwater ecosystems throughout their life cycle. Preserving ecosystem connectivity and the integrity of adjacent ecosystems has been identified as a priority for ecosystem-based management in Wainunu.

- ***Public health and livelihoods depend on environmental health.***
  Ecosystem-based management enhances the long-term productivity of local ecosystems, providing a strong foundation for local livelihoods, food security and nutrition. Managing environmental threats (such as contamination of fresh water) promotes positive public health outcomes, including prevention of communicable disease.

- ***Successful ridge-to-reef management depends on broad stakeholder input.***
  The effectiveness of government interventions in natural resource management issues is often undermined by fragmentation of responsibilities and jurisdiction between government agencies. Ecosystem-based management seeks to integrate management activities across sectoral boundaries and promote synergies between agencies, partner organisations and communities. This ensures that the concerns and priorities of a broad range of stakeholders are taken into account in management decisions, at the same time improving the quality of decision-making.

- ***Healthy ecosystems are the best defense against climate change impacts to livelihoods.***
  Only intact, healthy ecosystems can provide the full range of benefits that humans want and need over long periods of time. By maintaining and restoring 'natural infrastructure' such as mangroves, coral reefs and watershed vegetation, communities in Wainunu may reduce their vulnerability to the predicted effects of climate change such as extreme weather events, storm surges, rising sea levels and changing precipitation patterns.

3 SITE DESCRIPTION

3.1 MANAGEMENT AREA BOUNDARIES

This management plan covers Wainunu district and the adjacent customary fishing ground (*qoliqoli*).

Wainunu is an administrative unit (*tikina*) of Bua Province, in southwest Vanua Levu. Vanua Levu is the second largest island in the Republic of Fiji (see **Figure 3.1** below). The seaward boundary of the *tikina* is the high water mark. The landward boundaries of the *tikina* are contiguous with the traditional boundaries of indigenous land-owning clans (*mataqali*), as recorded by the *iTaukei* Lands and Fisheries Commission. The total area of *tikina* land is 277.6 square kilometres.

The boundaries of the Wainunu *qoliqoli*, as recorded by the *iTaukei* Lands and Fisheries Commission, extend from the high water mark to the outer edge of the barrier reef adjacent to the boundaries from the adjacent Nadi (west) and Kubulau (east) *qoliqoli* (see **Figure 3.2** over page). The total area of the *qoliqoli* is 136 square kilometres.

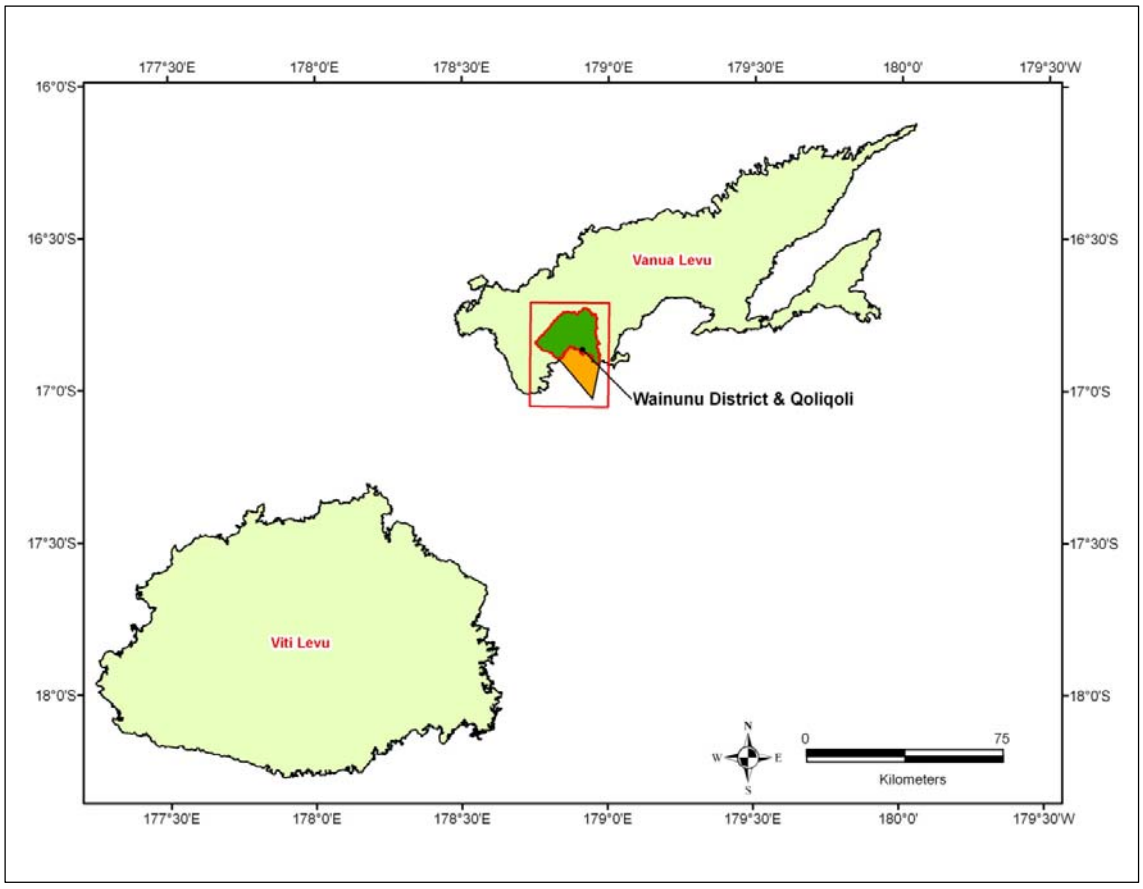


Figure 3.1. Wainunu district and fishing grounds on Fiji's second largest island of Vanua Levu

An extensive network of creeks and rivers flow from Wainunu's mountainous forests (**Figure 3.2**). Wainunu adjoins the districts of Kubulau to the east, Wailevu West to the northeast, Dreketi and Lekutu to the north and Nadi to the west.

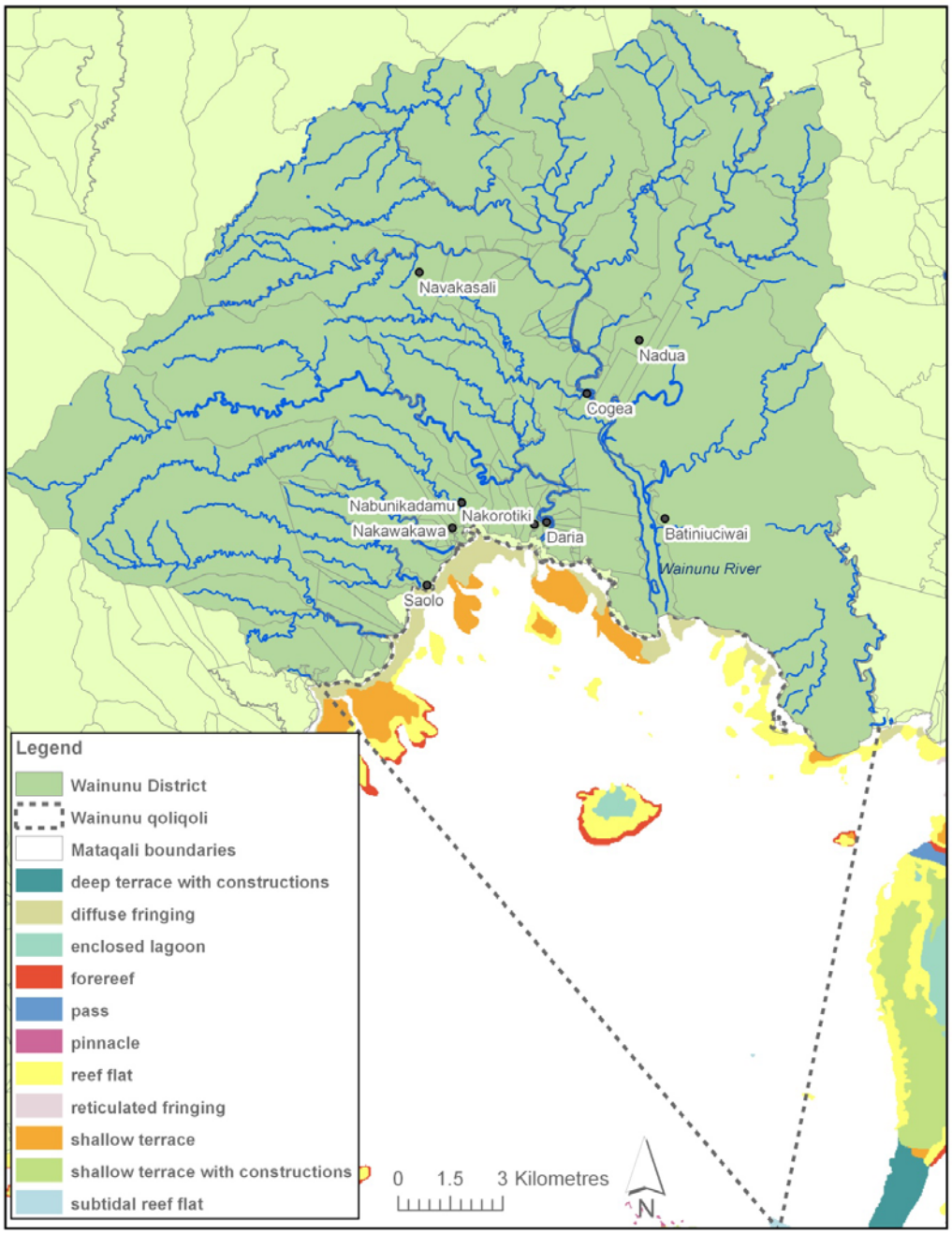


Figure 3.2. Wainunu district (*tikina*) and customary fishing ground (*qoliqoli*)[5]

[5] Prepared by Wildlife Conservation Society, based on GIS data provided by Department of Lands and Millenium Coral Reef Mapping Program coral reef habitat classes provided by Dr. Serge Andréfouët.

3.2 PEOPLE AND RESOURCES

The total population of Wainunu district is approximately 1,000 people, almost all of whom are indigenous Fijian (over 98%).[6] Wainunu has eight villages and two significant informal settlements, which range from approximately 50 to 400 people.

3.2.1 Demographics

Children and young adults make up a large proportion of the population, with 44% of people in the 0-19 year age range.[7] This is consistent with data from the 2007 census,[8] which showed that 43% of Wainunu's population were under the age of 21. The percentage of the population in each age range is as follows:[9]

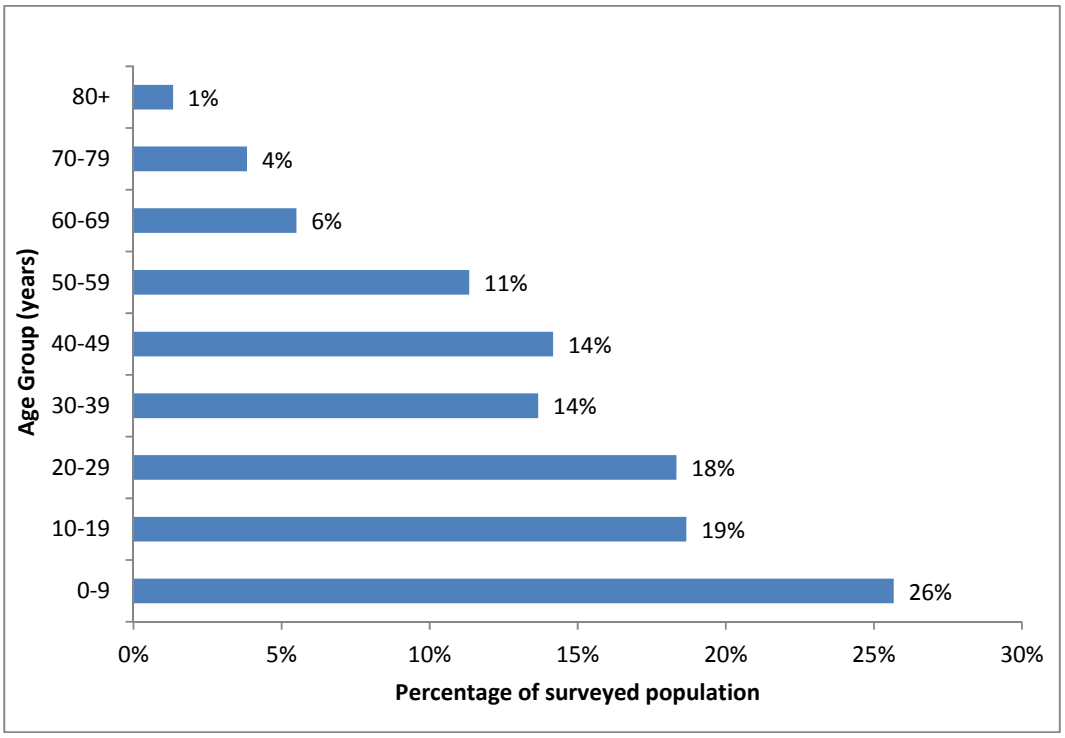


Figure 3.3. Wainunu population (%) by age group, based on WCS socio-economic survey (sample: 674 people) in February and March 2011

[6] Fiji National Census 2007 data, provided by Fiji Bureau of Statistics
[7] WCS (2011) *Socioeconomic Survey: Wainunu district*
[8] Fiji National Census 2007 data, provided by Fiji Bureau of Statistics
[9] WCS (2011) *Socioeconomic Survey: Wainunu district*

3.2.2 Resource tenure

A) TERRESTRIAL RESOURCES

Wainunu district has a total land area of 20,899 ha, of which 93% (19,368 ha) is iTaukei (native) land owned mostly by Wainunu's 50 landowning clans (*mataqali*)[10]. Land ownership boundaries for each *mataqali,* mapped by the iTaukei Lands and Fisheries Commission, are marked on **Figure 3.4**. The remaining 1,531ha (7%) is crown land.

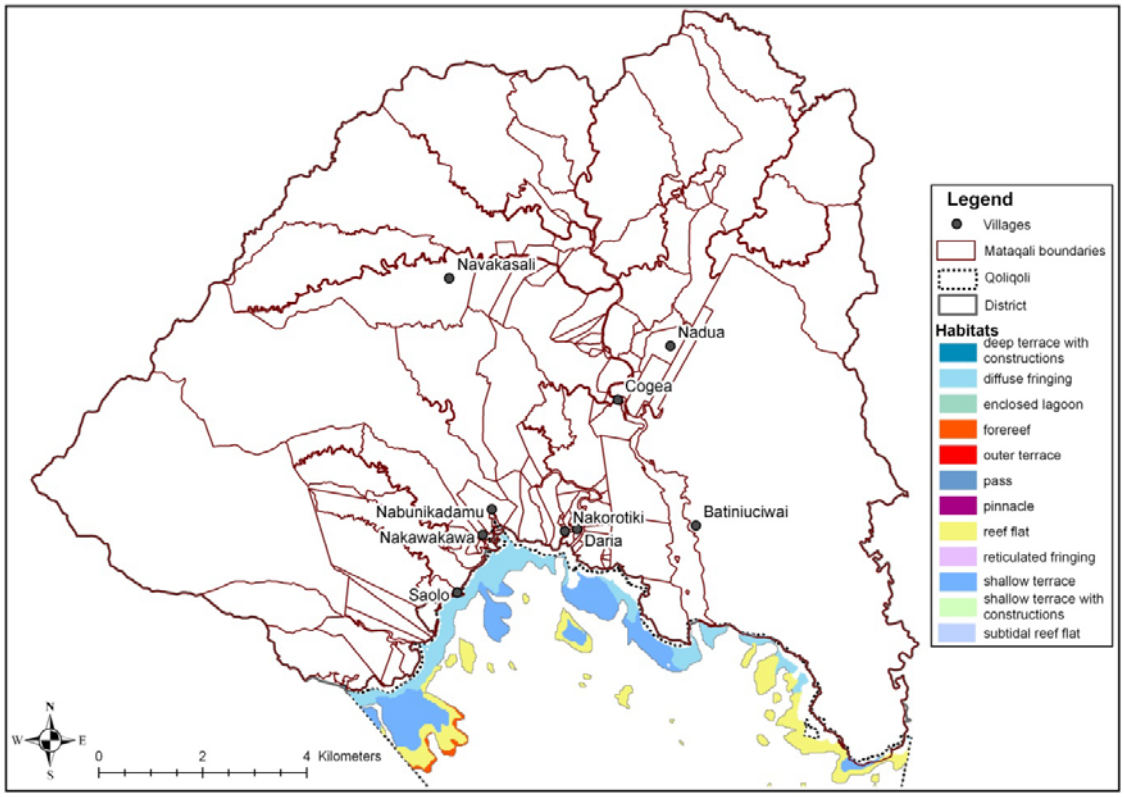


Figure 3.4. Mataqali land ownership boundaries in Wainunu district

The *iTaukei Lands Act* recognises and maintains customary ownership of *iTaukei* lands, and provides a legal basis for traditional communal decision-making about land use and management of terrestrial resources.[11] Decisions about occupation, use and management of land are made primarily at the *mataqali* level, within traditional decision-making structures and processes.

The *iTaukei Lands Trust Act* establishes the *iTaukei* Lands Trust Board (TLTB) and allows the TLTB to enter into leases and licences on behalf of *iTaukei* landowners. Leases and licences must only be granted with the consent of the majority of landowners.

The use and management of *iTaukei*, freehold and crown land is subject to the national laws of Fiji, including legislation such as the *Forest Decree 1992* and the *Environment Management Act 2005*.

[10] 2.9% of native land in Wainunu is officially owned by local tribes (*yavusa*), which consist of several clans (*mataqali*) and generally follow village boundaries.
[11] *ITaukei Lands Act* [Cap 133], s.3.

B) FRESHWATER RESOURCES

Under Fijian law, rivers and streams, and the land underneath them, belong to the government.[12] Extraction of streambed resources, such as gravel, requires approval from the Department of Lands.[13]

The *Fisheries Act* recognises subsistence fishing rights for traditional resource owners within their customary freshwater fishing grounds (*qoliqoli*). [14] The Minister for Fisheries may declare restricted fishing areas within freshwater qoliqoli by publishing a notice in the government gazette.[15] There are currently no gazetted freshwater restricted areas in Wainunu district.

C) COASTAL, ESTUARINE AND MARINE RESOURCES

Coastal land above the high tide mark may be *iTaukei* land, freehold land or crown land. Estuaries and coastal waters, and land below the high tide mark, belong to the government.[16] Extraction of resources from land below the high tide mark requires approval from the Department of Lands. [17]The *iTaukei Lands Act* recognises communities' rights of traditional access to resources, which includes their right to use mangroves for subsistence purposes.

The *Fisheries Act* recognises subsistence fishing rights for traditional resource owners within their customary estuarine and coastal fishing grounds (*qoliqoli*), including mangrove areas.[18] The boundaries of the Wainunu *qoliqoli*, as mapped by the *iTaukei* Fisheries Commission, are marked on **Figure 3.2**. The *Fisheries Act*, as currently administered, does not recognise the traditional right of resource owners to control access to their *qoliqoli* and to establish and enforce restricted fishing areas (*tabu*). The Minister for Fisheries may declare a restricted fishing area ('marine reserve') by making or amending regulations and publishing them in the Government Gazette.[19] There are currently no gazetted restricted areas in Wainunu district.

Any person wishing to fish for 'trade or business' must obtain a fishing licence from the Department of Fisheries. Licences are only granted with the written permission of the relevant chief, and may be granted subject to conditions, including conditions prohibiting fishing in *tabu* areas.

Resource owners in Wainunu recognise the customary authority of the Wainunu Resource Management Committe to make decisions, which must be approved by the distrist Hierachy Council (*Bose Vanua*), about use and management of marine resources at the *qoliqoli* level, including the establishment of district Marine Protected Areas (MPAs). Decisions about additional management measures for village fishing grounds (*i kanakana*) can be made at the village level, including the establishment of a village *tabu* or MPA.

[12] *Deed of Cession 1874*, *Rivers and Streams Act* [Cap 136], s.2.
[13] *Crown Lands Act* [Cap 132], s.10.
[14] *Fisheries Act* [Cap 158], s.13.
[15] *Fisheries Act* [Cap 158], s.9.
[16] *Deed of Cession 1874*.
[17] *Crown Lands Act* [Cap 132], s.10.
[18] *Fisheries Act* [Cap 158], s.13.
[19] *Fisheries Act* [Cap 158], s.9.

3.2.3 Resource use

D) INCOME GENERATING ACTIVITIES

Households in Wainunu are highly dependent on farming to meet their subsistence needs. They rely heavily on taro (*dalo*) and kava (*yaqona*) sales to generate cash income, as highlighted in the survey of households undertaken by WCS in 2011 (see **Figure 3.5** below).

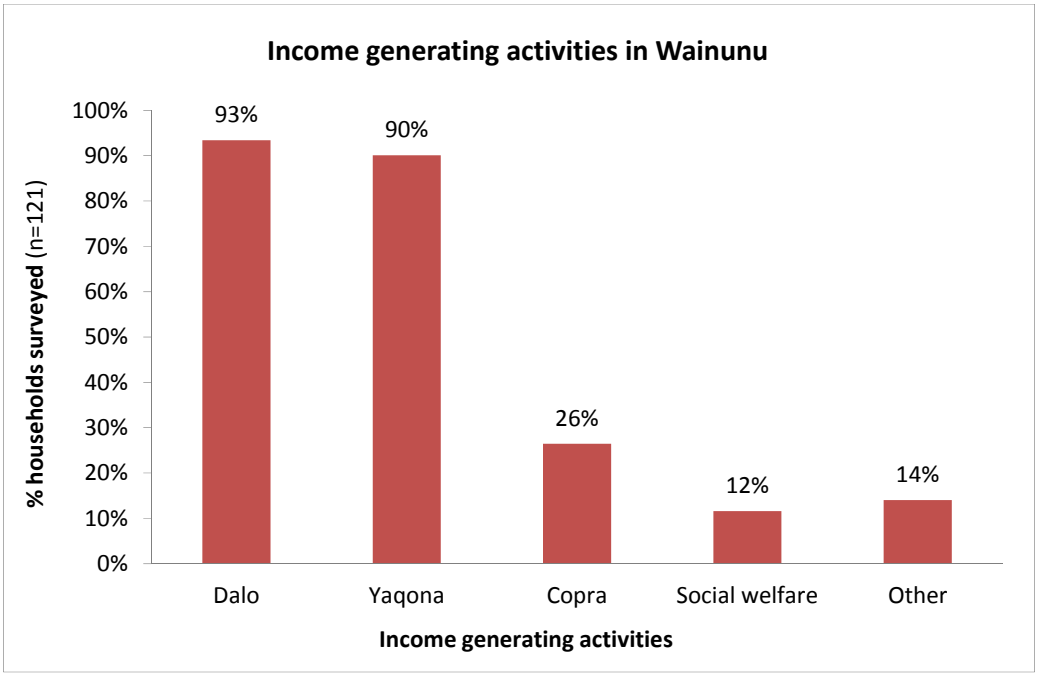


Figure 3.5. Percent of households listing income obtained various resources: Wainunu district, 2011

Very few households derive any income from freshwater, coastal/estuarine or marine resources. However, these are important at the subsistence level as a significant source of protein in the local diet. Freshwater prawns, fish and small black mud crabs (*kuka)* are consumed by more households than any other food sources except taro (*dalo*) and cassava (*tavioka*). The 121 households surveyed provided no evidence of livestock being raised for sale, although pigs are commonly kept for consumption.[20]

E) Fishing Methods

The most common types of fishing gear employed are nets, fishing lines, spear and snorkel. Targeted fishing areas include river tributaries, estuaries, intertidal zones (at low tide) and reefs (high tide and at night).

Tilapia (*maleya*) are being bred in ponds by some villages. This presents a risk that they will be accidentally introduced to rivers and streams, where the speed with which they establish, grow and breed, as well as their high tolerance to saline water conditions, can potentially impact on aquatic plants and other fish species to damage local ecosystems.

[20] WCS (2011) *Socioeconomic Survey: Wainunu district*

A) Farming Methods

The most commonly farmed crops are cassava (*tavioka*), taro (*dalo*) and kava (*yaqona*). Common farming implements are hand tools such as shovels, forks and cane knives. Slash and burn shifting agriculture and the use of fertilisers and pesticides is common throughout the district.

B) Copra Production

Copra production involves establishment and maintenance of coconut plantations, harvesting of mature coconuts and drying of coconut flesh (using the sun and/or wood fired dryers). Firewood for copra dryers is harvested locally. Because the drying of copra is a commercial activity, the use of mangroves for this purpose requires approval from the Department of Lands.[21]

Local farmers will generally focus on harvesting for copra when its market value rises or that of taro falls.

C) Other Resource Use

Local households do not appear to derive any income from lease payments for commercial land use activities and no household surveyed reported income from (or related to) native forest logging or plantation forestry.[22]

Wainunu is known to have significant bauxite deposits, the current exploration of which will determine commercial viability of extraction. Proposals for extraction are thought to be in development and recent announcements indicating that Wainunu has been earmarked for mining operations[23] have caused some concerns amongst local communities. The *Environmental Management Act* stipulates that Environmental Impact Assessment and further consultation would be required before any mining proposals could be considered for approval.

3.3 HABITATS

3.3.1 Terrestrial habitat description

The terrestrial habitats of Wainunu include a mix of natural vegetation types – rain forest, mesic forest, wetlands and coastal vegetation, and human-modified vegetation types including: gardens and plantations, pasture (grasslands maintained by grazing), talasiga (grasslands maintained by burning) and secondary forest (at various stages of recovery following logging, clearing or burning). Overall, the district is heavily forested, with 36% under primary forest, 50% under secondary forest, and 14% under plantations dominated by taro, kava and cassava crops.

[21] *Crown Lands Act* [Cap 132], s.10.
[22] WCS (2011) *Socioeconomic Survey: Wainunu district*
[23] http://www.fijitimes.com/story.aspx?id=198975

A) Terrestrial flora

Floristics surveys within riparian zones of Wainunu streams conducted in October 2010 found the following dominant species: *Atuna racemosa* (*makita*); *Gironniera celtidifolia* (*sisisi*); *Pometia pinnata* (*dawa*); *Ficus vitiensis* (*lolo*); *Cyathea* spp. (*balabala*); *Miscanthus floridulus* (*gasau*); *Inocarpus fagifer* (*ivi*); *Myristica castaneifolia* (*kaudamu*); and *Intsia bijuga* (*vesi*). Other large trees noted included: *Garcinia pseudoguttifera* (*bulu m*); *Bischofia javanica* (*koka*); *Dysoxylum lenticellare* (*malamala*); *Endospermum macrophyllum* (*kaukula*); *Serianthes melanesica* (*vaivai ni veikau*); and *Dillenia biflora* (*kuluva*). There was additionally a sighting of the now rare indigenous hardwood *Fagraea gracilipes* (*buabua*). Tree sizes were skewed towards saplings and, on average, trees were present along each transect in every size class, suggesting minimal recent forest disturbance.[24]

B) Threatenedand endemic species[25]

Three known endemic trees were specifically recorded during the October 2010 surveys: *F. vitiensis* (*lolo*); *M. castaneifolia* (*kaudamu*); and *E. macrophyllum* (*kaukula*). However, this was not a comprehensive forest survey and the numbers of endemics and threatened forest species are likely to be much greater, particularly given the extent of primary forest and since the adjacent primary forests of Kubulau District are characterised by a high degree of endemism.[26]

C) Economically and culturally important resources

I. bijuga (*vesi*) and *F. gracilipes* (*buabua*), found in Wainunu's forests, are both important hardwood species. Local households surveyed in 2011 identified the following as key subsistence resources harvested from the land: cassava (*tavioka*), taro (*dalo*), taro leaves (*rourou*), bananas (*jaina*), plantains (*vudi*), kava (*yaqona*), *Xanthosoma sagittifolium* (*dalo ni tana),* yams (*uvi*), edible hibiscus (*bele*), coconuts (*niu*), breadfruit (*uto*), pumpkin (*papukeni*), eggplant (*baigan*), and corn (*sila*). These resources are largely cultivated in village gardens and plantations (**Figure 3.6**). Wainunu is known as a farming district and terrestrial resources harvested for sale include coconuts (*niu*), kava *(yaqona*), and taro (*dalo*).

[24] Jupiter S, Jenkins A, Koto K, Ah Tong J, Bwebe T, Cakacaka A, Dulunaqio S, Fox M, Kuritani L, Mario S, Naisilisili W, Nand Y, Tukana A, Weeks R, Yakub N (2012) *Effects of alteration to catchments and streams on freshwater fish communities of Vanua Levu, Fiji.* Wildlife Conservation Society Fiji Country Program, Suva, Fiji

[25] See Appendix 1 for a full list of protected species in Fiji.

[26] Keppel, G. (2005) *Summary Report on Forests of the Mataqali Nadicake Kilaka, Kubulau District, Vanua Levu.* Prepared for the Wildlife Conservation Society, Suva, Fiji, 15 pp

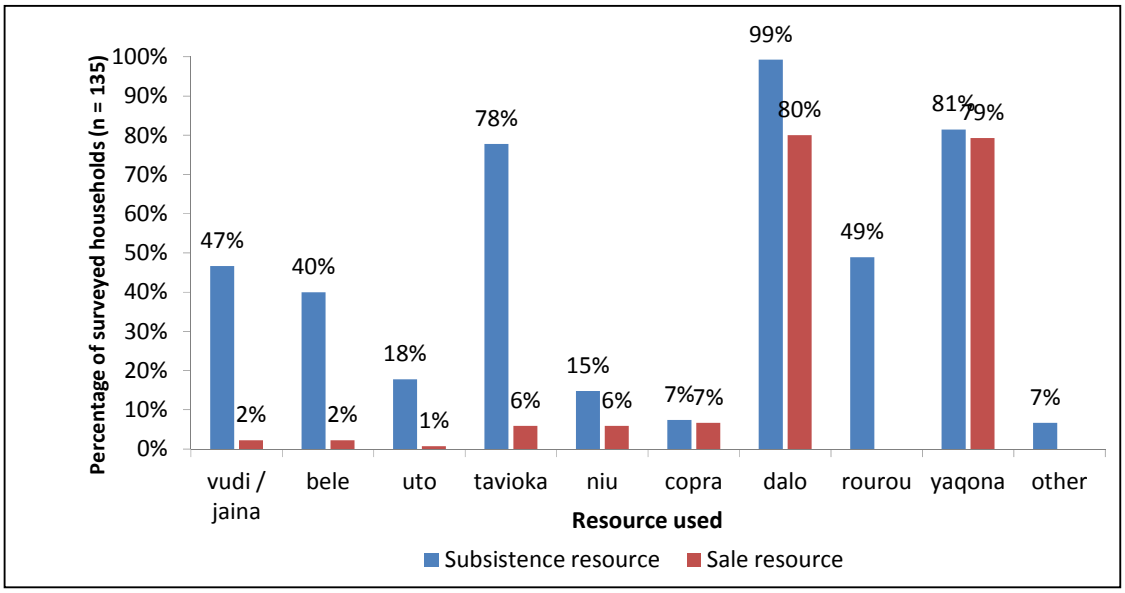


Figure 3.6. Percentage of surveyed households engaged in planting various terrestrial resources for subsistence and sale: Wainunu district, 2011

3.3.2 Freshwater habitat description

The Wainunu River is the largest freshwater river in the district, but also contains the lesser rivers Nalomate and Suetabu (adjacent to Kubulau district), and extensive stream networks. Surveys of riparian zones in 2010 found there to be tree species present throughout all size classes at most sites, suggesting minimal disturbance.[27] Small streams in Wainunu have a high amount of overhanging canopy cover (80-100%), which keep streams cool and provides shade for in-stream communities. The streams sampled had hard bottoms and good water quality (as indicated by low temperatures, low conductivity, and high dissolved oxygen concentrations).[28]

A) Freshwater fauna

To date, 60 species of freshwater fish have been found in Wainunu's rivers and streams and Wainunu is one of the only districts on Vanua Levu where no invasive freshwater fish have been recorded in flowing waterways.[29] The assemblages include important food fish, like the large gudgeons that are sensitive to sedimentation, and a high diversity of gobies, pipefish, eels, flagtails, cardinalfish, ponyfish, trevally, tarpon, mullet, goatfish, barracuda, and halfbeaks. These highly diverse communities composed of many species that are sensitive to catchment and stream alteration suggest that most of Wainunu's freshwater ways are in very good condition. However, in the 2010 survey, there were sites with good catchment and riparian forest cover where downstream overhanging culverts blocked the movements of species back upstream. In these sites, species richness and abundance were substantially lower than would have been otherwise predicted. The fish communities only included climbing species (*Anguila marmorata*); hardy

[27] Jupiter S, Jenkins A, Koto K, Ah Tong J, Bwebe T, Cakacaka A, Dulunaqio S, Fox M, Kuritani L, Mario S, Naisilisili W, Nand Y, Tukana A, Weeks R, Yakub N (2012) *Effects of alteration to catchments and streams on freshwater fish communities of Vanua Levu, Fiji.* Wildlife Conservation Society, Suva, Fiji, 17 pp

[28] Ibid

[29] Jenkins AP, Jupiter SD, Qauqau I, Atherton J (2010) *The importance of ecosystem-based management for conserving aquatic migratory pathways on tropical high islands: A case study from Fiji.* Aquatic Conservation: Marine and Freshwater Ecology 20:224-238

species that may have been trapped and survived upstream (*Eleotris fusca*) and one of Fiji's two endemic freshwater residents (*Redigobius leveri*).[30]

B) Threatened and endemic species

Six endemic freshwater fishes have been found in Wainunu freshwaters, including *Glossogobius* sp., *Redogobius leveri*, *Stenogobius* sp. 1, *Stiphodon* sp. 1, *Stiphodon* sp. 2, and *Schismatogobius vitiensis*. The "sp" plus a number refers to the fact that these species are new in Fiji and have not yet been officially named. This represents 55% of all of the known endemic freshwater fish species in Fiji.

C) Economically and culturally important resources

In Wainunu, a number of key food fish species spend part of their life in the lower freshwater reaches, including snappers (*Lutjanus argentimaculatus, L. fulvus*), ponyfishes (*Leiognathus equllus, L. splendens*) and goatfishes (*Upeneus sulphureus, U. vittatus*). Other key food fish species range from nearshore marine waters to the mid-reaches of freshwater, including trevally (*Caranx papuensis*), mullet (*Liza melinoptera*, *L. subviridis*, *L. vaigiensis*) and tarpon (*Megalops cyprinoids*). Mid-water reaches also support important food fish, such as the gudgeons (*Butis amboinensis*, *Giurus hoedti*, *Ophiocara porocephala*), flagtails (*Kuhlia munda*, *K. rupestris*, *K. marginata*), as well as populations of gobies that exhibit seasonally important migrations which have great economic value in Fiji (such as *Redigobius bikolanus*). All of these fish are likely to decline if non-native tilapia are introduced.

Local households surveyed in 2011 identified freshwater prawns (*ura*), shellfish (*sici*), mussels (*kai*), and fish (*ika* – flagtails, eels, gudgeons, gobies) as subsistence resources harvested from the freshwater habitats. A few respondents reported harvesting prawns for sale. One respondent reported harvesting tilapia once a week, which is likely from a pond.[31] Caution should be undertaken during harvests that no tilapia escape into waterways.

3.3.3 Coastal and estuarine habitat description

The coastline of the district of Wainunu extends approximately 31 kilometres in length along Bua's southwestern coast, including 672 ha of mangroves. Coastal and estuarine habitats play an important role in maintaining keys function, such as: trapping and filtering land-based pollutants; acting as nursery, breeding and feeding grounds for many marine and freshwater species; and providing protection to inland and watersheds from unexpected events such as cyclones, tidal waves, and tsunami.

[30] Jupiter S et al. supra n.27.
[31] WCS (2011) *Socioeconomic Survey: Wainunu district.*

A) Flora and fauna

The mangrove and seagrass systems of Wainunu have not yet been intensively surveyed, but they are likely to be similar to those in the adjacent district of Kubulau. In Kubulau, three mangrove species have been recorded. Kubualu District has a large dominant *Bruguiera gymnorhiza* zone with a small a very narrow *Rhizophora stylosa* and *R. x selala* zone. Preliminary assessment of seagrass beds in Kubulau identified *Syringodium isoetifolium* as the dominant species in intertidal and shallow subtidal areas, with *Halodule* sp. found in certain areas.[32] There were 108 fish species observed (out of the fish families surveyed by WCS) along coastal fringing reefs in Wainunu in 2011. Fringing reef flats were dominated by *Acropora*, *Montipora*, *Pavona*, and *Porites* corals, with considerable amounts of *Favia*, *Leptastrea*, *Goniastrea*, *Pocillopora*, and *Psammocora* corals. Fringing shallow reef slopes were dominated by *Acropora*, *Montipora*, *Pavona*, *Pocillopora*, and *Porites*, with considerable amounts of *Coscinaraea*, *Ctenactis*, *Echinopora*, *Favia, Favites, Fungia, Galaxea, Goniastrea, Leptastrea, Millepora, Platygyra,* and *Psammacora.*[33]

B) Threatened and endemic species

The information on the diversity and abundance of threatened flora and fauna is limited for Wainunu. The endemic rabbitfish (*Siganus uspi*) was sighted in coastal habitats during marine surveys in 2011. The Wainunu River mouth is known to be a breeding ground for bull sharks.

C) Economic and culturally important species

Eels and freshwater gudgeons are occasionally sold, although coastal fisheries in Wainunu are used mainly for subsistence. Fishery resources from coastal and estuarine habitats include reef fish, mud crab (*qari*), land crab (*lairo*), mangrove crab (*kuka*), mud lobster (*mana*), shrimps (*moci*), and other freshwater fish. The most frequently consumed resources from coastal and estuarine habitats are mangrove crab (*kuka*), followed by mud crab (*qari*) and land crab (*lairo*), while shrimps (*moci*) are the least consumed resource. Reef fishes such as snappers and groupers (mainly *kanace, kake* and *kabatia*) are occasionally consumed by the communities. Villagers within the district of Wainunu also stated that there was an observed decrease in mangrove crab (*kuka*) consumption since 2009 while others reported that resources stayed mostly unchanged. Mangroves are important as a source of fuel, either charcoal or firewood, and have often been used as primary materials for building boats, houses and furniture.[34]

D) Threats to coastal and estuarine habitats

Mangroves and seagrass meadows are directly threatened from inland activities. Threats to mangroves habitats include mangrove cutting, sedimentation, use of chemicals, deforestation, and littering. Sedimentation is considered the biggest threat to seagrass meadows, followed by cyclones, storms, and hurricanes and the use of chemicals. These threats equally affect coastal fringing reefs.

[32] WCS (2009) *Ecosystem-Based Management Plan: Kubulau District, Vanua Levu, Fiji*. Wildlife Conservation Society, Suva, Fiji, 121 pp
[33] WCS (2011) *Reef Resilience Assessment Data*
[34] WCS (2011) *Socioeconomic Survey: Wainunu district*

3.3.4 Marine habitat description

The 135.88 square kilometres within the Wainunu *qoliqoli* covers a diverse array of habitats (**Figure 3.7**), including reef flats dominated by macroalgae, seagrass beds, coastal fringing reefs, soft bottomed lagoons, patch reefs and mangrove area supporting fish nurseries.

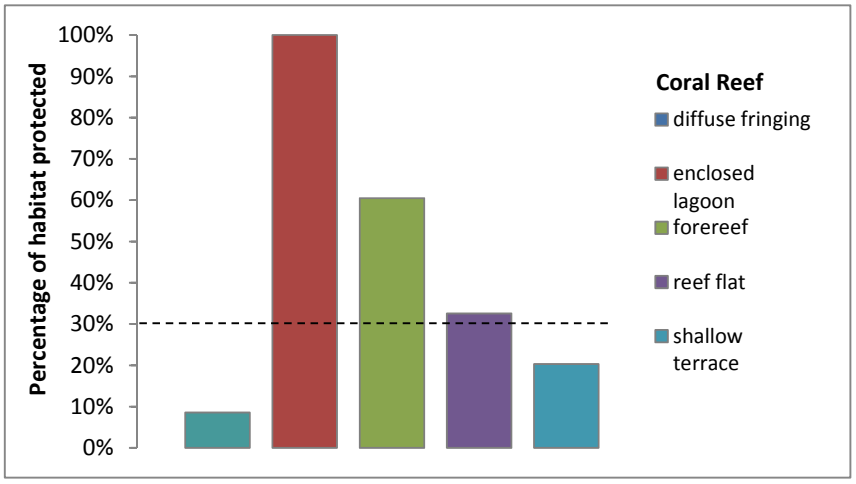


Figure 3.7. Representation of coral reef habitat types within the MPA network in Wainunu (dashed line indicates a representation target of 30%)

A) Flora and fauna

Of the 31 sites surveyed in the *qoliqoli*, fish diversity within families monitored was greatest within the Caniqe reef. Fish biomass and sizes of targeted food fish species were highest at the Kabatiko reef outside Saolo village. Although complete biodiversity assessments were not done for Wainunu, staff from the WCS counted 133 species from their target species list on fringing and patch reefs. The most abundant of these include grazers and detritivores (*Chlorurus bleekeri*, *Acanthurus auranticavus*, *Siganus doliatus*, *Zebrasoma scopas*, *Scarus ghobban*, *Scarus rivulatus*), butterflyfish (*Chaetodon baronessa*, *Chaetodon lunulatus*, *Chaetodon rafflesi*, *Chaetodon vagabundus*), the emperor *Lethrinus harak* and the goatfish *Parapeneus barberinus*. Other schooling species were also observed in high numbers together, including fusiliers (*Pterocaesio pisang, Pterocaesio tile*), snapper (*Lutjanus ehrenbergii, Lutjanus argentimaculatus, Lutjanus fulvus, Litjanus gibbus*), trevally (*Caranx papuensis*), surgeonfish (*Ctenochaetus striatus*) and rabbitfish (*Siganus spinus*). Patch reefs were dominated by *Acropora*, *Millepora*, *Pavona, Pocillopora* and *Porites,* with considerable amounts of *Astreopora, Ctenactis, Diploastrea, Echinopora, Favia, Favites, Fungia, Galaxea, Goniastrea, Merulina, Montipora, Pachyseris, Platygyra, Psammocora, Stylophora* and *Turbinaria*. [35]

[35] WCS (2009) *WCS-Fiji scientific monitoring protocol handbook.* Version 3.1. Wildlife Conservation Society, Suva, Fiji, 42 pp.

B) Threatened and endemic species

Siganus uspi, a Fijian endemic rabbitfish, was the only endemic fish species recorded, however as noted above, the WCS survey protocols only target certain fish groups and these groups do not contain many endemic species in general. Therefore, there are likely to be considerably more endemic fish found in Wainunu's qoliqoli. Blacktip (*Carcharhinus melanopterus*) and whitetip (*Triaenodon obesus*) reef sharks were spotted during dive surveys, as well as several turtles (likely green or hawksbills).

C) Economically and culturally important species

Wainunu residents surveyed identified the following as preferred food resources: trevally (*saqa, dole*), Spanish mackerel (*walu*), parrotfish (*ulavi, rawarawa*), emperor (*sabatu, dokonivudi, kabatia*), surgeonfish (*dridri, ikaloa*), mullet (*kanace*), large grouper (*kawakawa*), snapper (*kake*), sweetlips (*drekeni*), rabbitfish (*nuqa*), triggerfish (*cumu*), porcupine fish (*sokisoki*), bivalves (*seila, qeqe, kaikoso*), silver biddy (*matu*), grunter (*dreve, qitawa*), ray (*vai*), bivalves (*voce, riva*), gastropods (*yaga*), mackeral (*salala*), needlefish (*busa*), mud crabs (*qari*), lobster (*urau*), sea cucumber (*dri loli*), goatfish (*mokorau*), and seaweed (*lumi*).[36] Giant clams and sea cucumbers were likely once plentiful in Wainunu, but their populations have been severely affected by commercial extraction.

Biological monitoring surveys that were conducted in March 2011 highlighted specific areas within the *qoliqoli* that have high fish biomass and high coral cover, which are ideal areas to be protected (**Figure 3.8** over the page).[37]

[36] WCS (2011) *Socioeconomic Survey: Wainunu district*
[37] WCS (2011) *Reef Resilience Assessment Data: Wainunu district*

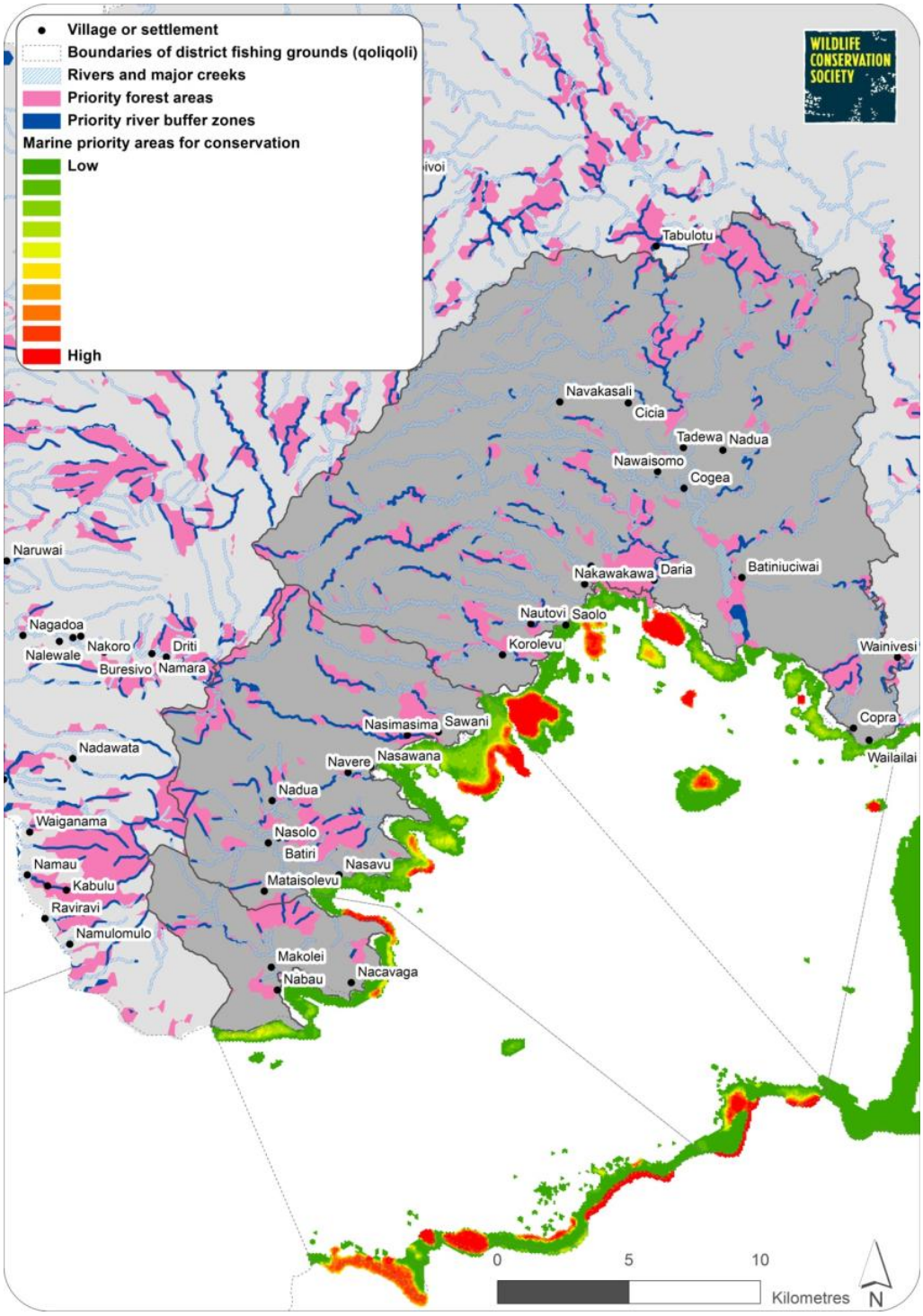


Figure 3.8. Map of ecosystem vulnerability and conservation value to inform prioritizing of protected areas

4 IMPLEMENTATION PLAN

4.1 OVERVIEW

Through a range of consultation, planning and conceptual modelling activities, the communities of Wainunu have established targets, identified threats to local ecosystems and outlined strategies through which these threats can be mitigated. They have established protected areas and management rules as key elements of implementation. Communities of Wainunu have established a total of ten protected areas, as outlined in **Figure 4.1** below.

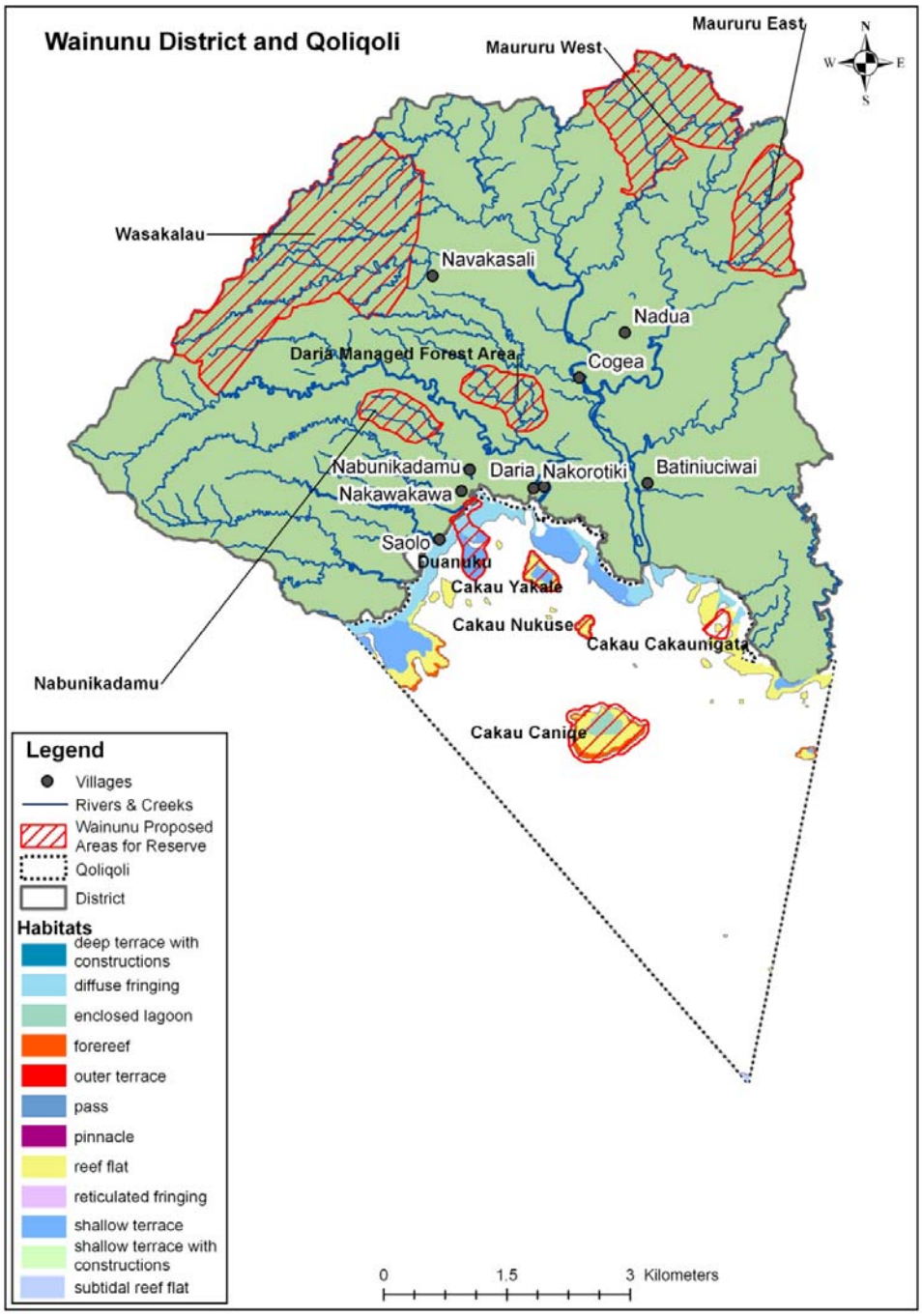


Figure 4.1 Map highlighting the protected areas identified in Wainunu district

The size and management responsibility for each of the protected areas is outlined in **Table 4.1** below.

Table 4.1. Community declared protected areas, Wainunu district [38]

PROTECTED AREA NAME	HABITAT	MANAGEMENT RESPONSIBILITY	AREA (KM^2)
Wasakalau	Terrestrial / Freshwater	Navakasali	21.5
Maururu West	Terrestrial / Freshwater	Nadua	11.9
Maururu East	Terrestrial / Freshwater	Nadua	6.5
Nabunikadamu	Terrestrial / Freshwater	Nabunikadamu	2.7
Daria Managed Forest	Terrestrial / Freshwater	Daria/Naorotiki	5.8
Duanuku	Coastal / Marine	Saolo	1.6
Cakau Cakaunigata	Marine (nearshore reef)	District	0.5
Cakau Yakale	Marine (nearshore reef)	District	0.8
Cakau Nukuse	Marine (nearshore reef)	District	0.3
Cakau Caniqe	Marine (offshore reef)	District	3.4
		TOTAL:	**55 KM^2**

This section summarises the targets, threats, management rules, management activities and best practice considerations for terrestrial and freshwater, coastal and estuarine and marine ecosystems.

[38] Community Consultation on protected area conditions within Wainunu, January 2012. Modified at Management Support Workshop, February 2012 and approved by the Wainunu Hierarchy Council (*Bose Vanua*) in March 2012 .

4.2 MANAGEMENT OF TERRESTRIAL AND FRESHWATER ECOSYSTEMS

4.2.1 Management Targets for Terrestrial and Freshwater Ecosystems

Due to overlapping threats and integrated strategies, terrestrial and freshwater ecosystems have been brought together in the following section of the management plan. The following management targets were identified for terrestrial and freshwater ecosystems in Wainunu:[39]

Terrestrial targets	Freshwater targets
Maintain or restore **healthy riparian vegetation**	
Maintain or restore the diversity and abundance of **native trees** Maintain or restore the abundance and diversity of **forest fauna**	Maintain or enhance water quality Maintain abundance and biomass of **freshwater food species** (*ikadroka, duna, ura, sici, vo*) Maintain or enhance the biomass and diversity of **native fish**

4.2.2 Threats to Terrestrial and Freshwater Ecosystems

Participants identified the following key threats to the health and productivity of terrestrial and freshwater ecosystems in Wainunu:

Threats to terrestrial ecosystems	Threats to freshwater ecosystems
Unsustainable logging Unsustainable farming (burning, spraying of chemicals and farming/livestock in riparian zones) Soil erosion Extreme weather and flooding	
Invasive species Mining Clearing land for agriculture	Inappropriate disposal of domestic and human waste Overhanging culverts Non-native(invasive) species Loss of river habitats Destructive fishing methods

Links between threats were identified, with unsustainable farming and logging highlighted as key drivers of soil erosion, resulting in nutrification and sedimentation of streams, rivers, estuaries and coastal marine waters.

Contributing factors and underlying causes for these threats were also identified. These included:

- a lack of understanding, particularly about the impacts of unsustainable practices;
- lack of planning, particularly in relation to farming, fishing, use of trees and waste disposal;
- lack of awareness and/or enforcement of existing management rules;
- increasing financial pressures and farming as the only source of income; and
- laziness, exacerbated by *yaqona* abuse.

These targets and threats are illustrated graphically in **Appendix 4** (terrestrial threat diagram) and **Appendix 5** (freshwater threat diagram) and provided a reference when drafting the following management rules and activities.

[39] Adopted at the WRMC Management Support Workshop in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (*Bose Vanua*) in March 2012.

4.2.3 Terrestrial and Freshwater Protected Areas

Figure 4.2 below outlines protected areas covering land and rivers in Wainunu[40].

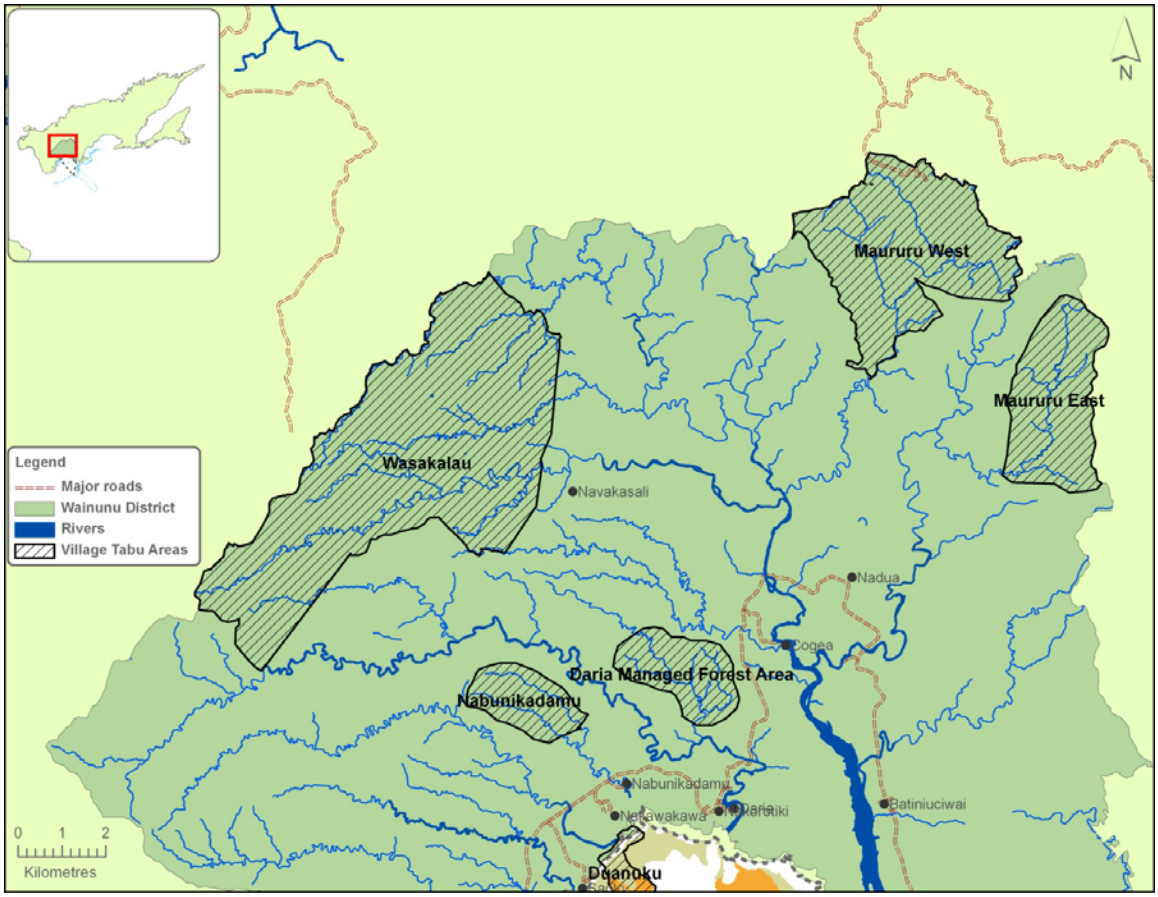


Figure 4.2. Terrestrial and freshwater protected areas in Wainunu.

A single set of district-level management rules will apply to terrestrial and freshwater protected areas in Wainunu. These are outlined in **Table 4.2** below. Table 4.1 on page 21 identifies which villages are responsible for implementation of management rules within each of these areas.

Table 4.2. Management rules for terrestrial and freshwater protected areas[41].

Rules for terrestrial and freshwater protected areas	Exception
All mining, logging, farming and fishing is prohibited.	Fish and prawns can be harvested for a village or church function (maximum one time per year).
Mining, logging and clearing for farming are prohibited within 100 m of the protected area boundary.	None.
Planting of non-native trees is prohibited.	None

[40] Adopted by the WRMC in Nakawakawa, Feb 2012. Approved by the Hierarchy Council (Bose Vanua) in March 2012
[41] Adopted by the WRMC in Nakawakawa, Feb 2012, and approved by the Bose Vanua in March 2012

4.2.4 Management Rules for Terrestrial and Freshwater Ecosystems

Table 4.3 below outlines management rules that apply generally to all land, rivers and streams in Wainunu.

Table 4.3. Terrestrial and freshwater management rules

Management Rule	Exception	National	District	Management Action[42]
LOGGING				
Logging is prohibited within 50 m of river banks.	Bridges and stream crossings approved by Forest Department.		✗[43]	Turaga ni-mataqali to ensure this rule is included in native land lease and/or forest license as a condition of consent. Monitor compliance and report breaches to WRMC
Logging operations must leave buffer strips beside rivers and streams: • **20m stream width: 30m buffer** • **10-20m stream width: 20m buffer** • **0-10m stream width: 10m buffer**	Bridges and stream crossings approved by Forest Department.	✗[44]		Monitor compliance with *Forest Harvesting Code of Practice* and notify Forest Department of breaches. ***Note:*** *Stream width is measured from bank to bank. Buffer width is horizontal distance measured from stream bank.*
Commercial logging operations must not be commenced without environmental impact assessment (EIA) and approval from the Department of Environment.		✗[45]		Monitor new logging operations and report breaches to the Department of Environment and Forest Department.
Commercial logging operations must not be commenced without the consent of landowners and approval from the iTaukei Land Trust Board and Department of Forestry		✗[46]		Monitor new logging operations and report breaches to the iTaukei Land Trust Board and Forest Department.

[42] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.
[43] Adopted by the WRMC in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (Bose Vanua) in March 2012.
[44] *Forest Decree 1992, Fiji Forest Harvesting Code of Practice 2008.*
[45] *Environment Management Act 2005*, Schedule 2, Part 1.
[46] *Native Lands Trust Act, Forest Decree 1992.*

Management Rule	Exception	National	District[47]	Management Action[48]
Logging operations must comply with logging licence conditions and the *Forest Harvesting Code of Practice.*		✗[49]		Monitor compliance with *Forest Harvesting Code of Practice* and notify Forest Department of breaches.
Rare or protected tree species must not be felled or taken.		✗[50]		Monitor compliance with *Forest Harvesting Code of Practice* and notify Forest Department of breaches.
FARMING AND LIVESTOCK				
Clearing, burning and farming are prohibited within 10 m of river banks.			✗	Raise awareness of rule. Monitor compliance. Report breaches to WRMC.
Agricultural leaseholders must not clear, burn or cultivate any land within 24 feet (7.2m) of a river or stream.	Harvesting of crops planted on or before 1 June 2012	✗[51]		Monitor compliance with lease conditions. Notify the **iTaukei** Land Trust Board of breaches.
Livestock and piggeries are prohibited within 30 m of river banks.			✗	Raise awareness of rule. Monitor compliance. Report breaches to WRMC.
FISHING				
Introduction or farming of invasive fish species is prohibited.	Where tilapia are already kept in ponds that are sufficient distance from rivers/streams (outside the floodplain).		✗	Raise awareness of rule. Monitor compliance. Report breaches to WRMC.
Destructive fishing methods are prohibited: - **Chemicals and poisons** - **Nets with mesh less than 50mm** - **Night Fishing**	Hand nets with a mesh of 40 mm can be used for freshwater prawns.	✗[52]		Raise awareness of rule. Monitor compliance. Report breaches to WRMC.

[47] All district rules adopted by the WRMC in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (Bose Vanua) in March 2012
[48] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.
[49] *Forest Decree 1992, Fiji Forest Harvesting Code of Practice 2008.*
[50] *Fiji Forest Harvesting Code of Practice 2008 (see Appendix 1 for list of protected species).*
[51] *Native Land Trust (Leases and Licences) Regulations 1984*, *r.23*, Fourth Schedule, cl.25. *Conditions of lease for agricultural purposes*.
[52] *Fisheries Regulations* r8 bans use of any *derris* or *duva* extract. *Fisheries Regulations* r16

Management Rule	Exception	National	District	Management Action[53]
DEVELOPMENT				
Industrial or commercial development must not be undertaken without Environmental Impact Assessment.		✗[54]		Report breaches to Department of Environment.
Houses and village structures must not be built within 30m of any stream without environmental impact assessment.		✗[55]		Report breaches to Department of Environment.

[53] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.
[54] *Environment Management Act 2005*.
[55] *Environment Management Act 2005*, Schedule 2, Part 3.

4.2.5 Management Activities for Terrestrial and Freshwater Ecosystems

Table 4.4 below outlines management activities to be undertaken in relation to terrestrial and freshwater ecosystems in Wainunu district.[56]

Table 4.4. Management activities for terrestrial and freshwater ecosystems.

ISSUE	ACTIVITY	IMPLEMENTATION	TO BE COMPLETED BY
SHORT TERM			
Protected areas haven't been officially established and blessed	Present plans to Tui Wainunu and Bose Vanua for endorsement. Arrange blessing/ launching ceremony and notify communities when rules/tabus active	WRMC	Jun 2012
Lack of awareness of sustainable farming practices	Education/training on sustainable farming practices, including alternatives to burning and shifting cultivation and the intensive use of chemicals	WCS engage a training provider and organise training through WRMC	Dec 2012
Communities and stakeholders need to be aware of protected area boundaries and understand rules	Update villages through village meetings. Ensure they understand rules and protected area boundaries	WRMC Communication sub-group	Mar-Apr 2012
	Identify key stakeholders and provide them with updated rules and maps of protected areas	WRMC Communication sub-group	May 2012
Lack of awareness of the impacts of logging and failure to comply with rules and laws	Education/training to build understanding and help apply principles of forest conservation	WCS engage a training provider and organise training through WRMC	Dec 2012
	Circulate copies of the Fiji Forest Harvesting Code of Practice to those monitoring forest areas	WRMC	May 2012
Need effective monitoring and enforcement to implement the plan	Identify and put in place local mechanisms for monitoring terrestrial and freshwater rules, recording any breaches and feeding back to WRMC. Confirm this with villages through village meetings	WRMC	Sept 2012

[56] Identified at the WRMC Management Support Workshop, Nakawakawa, 28 February 2012.

ISSUE	ACTIVITY	IMPLEMENTATION	TIMEFRAME
MEDIUM / LONG TERM			
Need effective monitoring and enforcement to implement the plan[57]	Record and report breaches of the rules and the logging code of practice.	WRMC	Jun 2012 onwards
	Review how breaches are acted upon when reported	WRMC	Oct 2012
	Review potential to formalise Protected Area status if required	WCS and Dept Forestry can provide options for protected area status for WRMC consideration	Apr 2013
Need to change attitudes and practices in local communities	WRMC undertake leadership training and community facilitator training. WCS will seek to identify funding and support WRMC to apply their training to influence attitudes and behaviours and realise changes in local practices	WCS and WRMC	Dec 2012
Potential introduction of new mining activities	Monitor mining proposals in and near Wainunu to ensure that environmental impacts are fully assessed	WRMC	May 2012 onwards
Introduction of tilapia	Increase awareness of the impacts of invasive fish species. Support communities to minimise risk of invasive species being accidentally introduced from ponds into streams/rivers	WCS can provide information for WRMC to disseminate to villages	Jun 2012 onwards
Lack of alternative income puts pressure on villages to utilise natural resource unsustainably	Villages to develop proposals for local sustainable enterprises	WRMC and partners with relevant remit, funding and skills	Feb 2013
	Investigate the potential for forest based ecotourism and develop plans and proposals as appropriate	Landowners, CORAL, Department of Tourism	Apr 2013

[57] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.

4.2.6 Best Practice Considerations for Terrestrial and Freshwater Ecosystems

To maintain and restore the health, productivity and resilience of terrestrial ecosystems, the following practices are recommended:

RECOMMENDATION	RATIONALE
FARMING	
Do not use fire to clear land for farming.	Burning reduces soil fertility, increases soil erosion and reduces downstream water quality.
Do not clear, burn or farm within 100 metres of stream and river banks	Broad riparian buffers reduce soil erosion and improve downstream water quality.
Do not allow clearing, burning, farming or grazing in drinking water catchments.	Clearing, burning and grazing reduces the quality and quantity of drinking water.
Use fertilisers and pesticides only as necessary, and always follow manufacturer's instructions.	Fertilisers cause algal growth and eutrophication. Many pesticides are toxic to people and animals.
Do not farm steep slopes. Use terrace and contour planting to control soil erosion.	Farming steep slopes increases soil erosion and reduces downstream water quality.
FORESTS AND WATER CATCHMENTS	
Do not allow clearing, burning, logging or grazing in old growth forests.	Old growth forests are home to many unique species, and may take centuries to fully recover.
Do not allow clearing, burning, logging or grazing within 100 metres of old growth forests.	Logging and grazing near old growth forest increases the risk of invasive species.
Do not allow logging within 100 metres of a river of stream.	Broad riparian buffers reduce soil erosion and improve downstream water quality.
Do not allow logging in drinking water catchments.	Logging reduces the quality and quantity of drinking water.
Monitor logging operations and report breaches of logging code of practice or licence conditions.	Community monitoring ensures compliance with environmental protection rules.
Replant logged areas using local native species.	Restoring forests after logging helps to maintain water catchment health and biological diversity.
RIVERS AND RIPARIAN ZONES	
Restore degraded river banks and riparian zones by planting native trees and shrubs.	Riparian vegetation reduces erosion and provides food and shade for freshwater fauna.
Do not build crossings, weirs or other structures in a manner that prevents fish migration.	Migration up and down rivers is a vital part of the life cycle of many fishes, including food fish.
INVASIVE SPECIES	
Do not introduce invasive species.	Invasive species reduce agricultural productivity and threaten native plants and animals.

4.3 MANAGEMENT OF COASTAL AND ESTUARINE ECOSYSTEMS

4.3.1 Management Targets for Coastal and Estuarine Ecosystems

The following management targets were identified for coastal and estuarine ecosystems in Wainunu[58]:

Targets for coastal and estuarine ecosystems
• Maintain or increase total **area of mangroves**. • Maintain or increase abundance and biomass of **crabs**. • Maintain or increase abundance and biomass of **fish**. • Maintain or increase abundance and biomass of **invertebrates**. • Maintain **beaches** as habitat and coastal **buffer zone**. • Maintain or increase abundance and biomass of **seagrass**.

4.3.2 Threats to Coastal and Estuarine Ecosystems

Participants also identified the following key threats to the health and productivity of estuarine and coastal ecosystems in Wainunu:

Threats to coastal/estuarine ecosystems	Contributing factors
Mangrove cutting	• Lack of awareness of the importance of mangrove ecosystems • Harvesting firewood for copra driers • Harvesting firewood for commercial sale • Timber harvesting for construction
Poor waste management	• Lack of rubbish disposal pits • Livestock waste (pigs and cattle) • Lack of awareness of health impacts • Lack of awareness of environmental impacts • Lack of community waste management rules
Over-exploitation of mangrove fisheries	• Use of fine mesh nets • Over-harvesting of invertebrates • Lack of awareness of importance of mangrove fisheries
Digging out crab holes	• Longing for certain foods • The need for crabs for special occasions
Excessive use of chemicals	• Lack of understanding about the impacts • Laziness and poor time management • Increased need for money
Commercial sale of fish and sand	• Increased demand with influx of new development (particularly new roads) • Increased need for money (linked to growth in population and paid-for goods and services)
Flooding and natural disasters	• Increased development • Cutting down trees on the riverbank

These targets and threats are illustrated graphically in **Appendix 6 (**coastal and estuarine threats diagram).

[58]Adopted at the WRMC Management Support Workshop in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (*Bose Vanua*) in March 2012.

4.3.3 Coastal and Estuarine Protected Areas

Although predominantly marine, the Duanuku protected area (see **Figure 4.1** and **Table 4.1**) includes coastal and estuarine habitats. Fishing, taking crabs and cutting mangroves are prohibited in this protected area, with an exception for taking fish and crabs for a village or church function (no more than once in any twelve month period.)

4.3.4 Management Rules for Coastal and Estuarine Ecosystems

The following management rules apply to all coastal and estuarine areas in Wainunu, as shown in **Table 4.5** below.

Table 4.5. Coastal and estuarine management rules (continued over the page)

Management Rule	Exception	National	District	Management Action[59]
FISHING AND CRABS				
Using a net in an estuary or within 100 m of the mouth of any river or stream is prohibited.	Fishing with a hand net, wading net or cast net.	✗[60]		Monitoring by fish wardens. Report breaches to Department of Fisheries.
'Digging up' crabs and mud crabs (and destroying their holes) is prohibited.			✗[61]	Raise awareness.[62] Monitor. Report breaches to WRMC.
Harvesting undersized fish and crabs is prohibited.		✗[63]		Raise awareness of size limits (distribute tables and rulers). Monitoring by fish wardens.
Taking any of the protected species listed in Appendix 1 is prohibited.		✗[64]		Report breaches to the Department of Environment.

[59] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.
[60] *Fisheries Regulations* r.7 (refer to Appendix 2 for definitions of net types).
[61] Adopted by the WRMC in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (Bose Vanua) in March 2012.
[62] Promoting sustainable methods of catching by hand, hooking from burrows and using baited hoop nets or pots.
[63] *Fisheries Regulations* rr. 18, 19, 21, 25B (See Appendix 3 for guidance on minimum catch sizes).
[64] *Fisheries Regulations*, *Endangered and Protected Species Act 2002*.

Management Rule	Exception	National	District[65]	Management Action[66]
MANGROVE CUTTING				
Cutting and clearing of mangroves for commercial purposes is prohibited.	Cutting of rotten mangrove trees to establish access for boats or harvesting approved by WRMC, Forest Department and Department of Lands.	✗[67]	✗	Monitor. Report breaches to WRMC, Forest Department and Department of Lands.
PIGS AND LIVESTOCK				
Livestock and piggery are prohibited within 30 m of mangrove forest and coastal high tide mark.			✗	Monitor. Report breaches to WRMC.
WASTE DISPOSAL				
Dumping of rubbish in estuaries, mangroves and on foreshores is prohibited		✗[68]	✗	Report breaches by commercial or industrial facilities to Department of Environment. Report other breaches to WRMC.

[65] All district rules adopted by the WRMC in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (Bose Vanua) in March 2012
[66] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.
[67] *Crown Lands Act* [Cap. 132], s.32. *Forest Decree 1992,* ss.9, 22. Customary rights to harvest timber for firewood and village construction are protected in *Forest Decree*.
[68] *Litter Decree 1991, s8*.

4.3.5 Management Activities for Coastal and Estuarine Ecosystems

Table 4.6. Management activities for coastal and estuarine ecosystems in Wainunu..[69]

ISSUE	ACTIVITY	IMPLEMENTATION	TIMEFRAME
SHORT TERM			
Protected areas haven't been officially established and blessed	Present plans to Tui Wainunu and the Bose Vanua for endorsement and arrange for blessing/opening ceremony	WRMC	Jun 2012
Communities and stakeholders need to be aware of protected area boundaries and understand rules	Update villages through village meetings. Ensure they understand rules and protected area boundaries	WRMC Communication sub-group	Mar-Apr 2012
	Identify key stakeholders and provide them with updated rules and maps of protected areas	WRMC Communication sub-group	Jun 2012
Need effective monitoring and enforcement to implement plan	Train and equip local fish wardens (involving WRMC in training)	Dept Fisheries to provide local training through WRMC	Apr 2012
	Identify and put in place local mechanisms for monitoring coastal/estuarine areas, recording any breaches of rules and feeding back to WRMC. Confirm this with villages through village meetings	Daria/Saolo villages WRMC Enforcement sub-group	Jun 2012
	Report incidents of illegal commercial sale of timber from mangroves (to help enforce the national law prohibiting commercial mangrove cutting)	Villages and WRMC Enforcement sub-group	Jun 2012
MEDIUM / LONG TERM			
Need effective monitoring, enforcement and review of implementation[70]	Record and report breaches of rules and laws	Fish wardens	Jul 2012 onwards
	Review enforcement issues at district level to identify specific issues /challenges	Fish wardens and WRMC	Oct 2012
	Monitor the impact of the coastal *tabu* against the targets identified in 4.3.1 above	WRMC supported by WCS	Annually from Jun 2013
	Consider increasing the area under MPA designation in Wainunu	WRMC	Jul 2014 Jul 2015
Need to change attitudes and practices in local communities	WRMC undertake leadership training and community facilitator training in order to influence attitudes and changes in local practices. WCS will seek to identify funding for training and to support WRMC in its application	WCS and WRMC	Dec 2012

[69] Identified at the WRMC Management Support Workshop, Nakawakawa, 28 February 2012.
[70] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.

4.3.6 Best Practice Considerations for Coastal and Estuarine Ecosystems

To maintain and restore the health, productivity and resilience of coastal and estuarine ecosystems, the following practices are recommended:

RECOMMENDATION	RATIONALE
Limit harvesting of mangroves to ensure no net loss in mangrove area.	Mangroves are valuable as a fish hatchery, nursery, feeding ground and habitat.
Restore degraded mangrove areas by planting native mangrove species.	Mangroves reduce coastal erosion and provide valuable protection from storm surges.
If the *tabu* is opened, do not use nets with a mesh size less than 75mm (except for small hand nets) and limit take to amount likely to have accumulated during closure	Periodic harvesting can affect species abundance and diversity, wiping out any conservation gains through the *tabu.*
Houses and village structures (including jetties) should not be built within 30m of high tide mark without an environmental impact assessment.[71]	Building in the coastal zone could cause coastal erosion and result in pollution of marine waters.
Industrial or commercial development must not be undertaken without environmental impact assessment.[72]	A wide range of environmental impacts may result from such development, for example coastal erosion or pollution and damage to natural ecosystems such as mangroves.

[71] *Environment Management Act, 2005*
[72] *Environment Management Act, 2005*

4.4 MANAGEMENT OF MARINE ECOSYSTEMS

4.4.1 Management Targets for Marine Ecosystems

The following management targets were identified for marine ecosystems in Wainunu[73]:

Targets for marine ecosystems
• Increase abundance and biomass of food fish and endangered fish species (including bumphead parrotfish, grouper, emperor and humphead wrasse) • Increase invertebrate abundance and biomass, including clams and beche-de-mer. • Maintain or improve abundance and diversity of coral species and enhance the health, productivity and resilience of coral reefs. • Maintain or improve abundance and diversity of lobsters • Maintain or improve abundance and diversity of sharks

4.4.2 Threats to Marine Ecosystems

Participants also identified the following key threats to the health and productivity of marine ecosystems in Wainunu:

Threats to coastal/estuarine ecosystems	Contributing factors
Overfishing	• Lack of awareness of community management rules • Lack of awareness of impacts of overharvesting • Lack of alternative sources of protein • Lack of awareness and enforcement of national fisheries legislation • Increased need for money (linked to growth in population and paid-for goods and services) • Failure to comply with national laws on destructive fishing methods
Destructive fishing practices including dynamite, *derris* root, compressor, night fishing and nets with undersize mesh	
Oil spill from village boats	• Lack of care and awareness by fishermen
Sedimentation from run-off	• Logging, farming and mining practices that contribute to soil erosion
Poaching	• Lack of enforcement and monitoring of *tabu* areas • Lack of equipment and boat for fish wardens

Communities' lack of alternative income sources was identified as an underlying driver of their intensive farming methods (linked to soil erosion and excessive chemical use) and over-exploitation of marine fisheries. Participants emphasised the need to develop small business proposals and to prioritise education for youth to improve their career prospects.

These targets and threats are illustrated graphically in **Appendix 7** (marine threats diagram) and provided a reference when identifying protected areas and drafting management rules and activities.

[73]Adopted at the WRMC Management Support Workshop in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (*Bose Vanua*) in March 2012.

4.4.3 Marine Protected Areas

Figure 4.3 below shows the marine protected areas (MPAs) in Wainunu fishing grounds, with management rules for these areas outlined in **Table 4.7**.

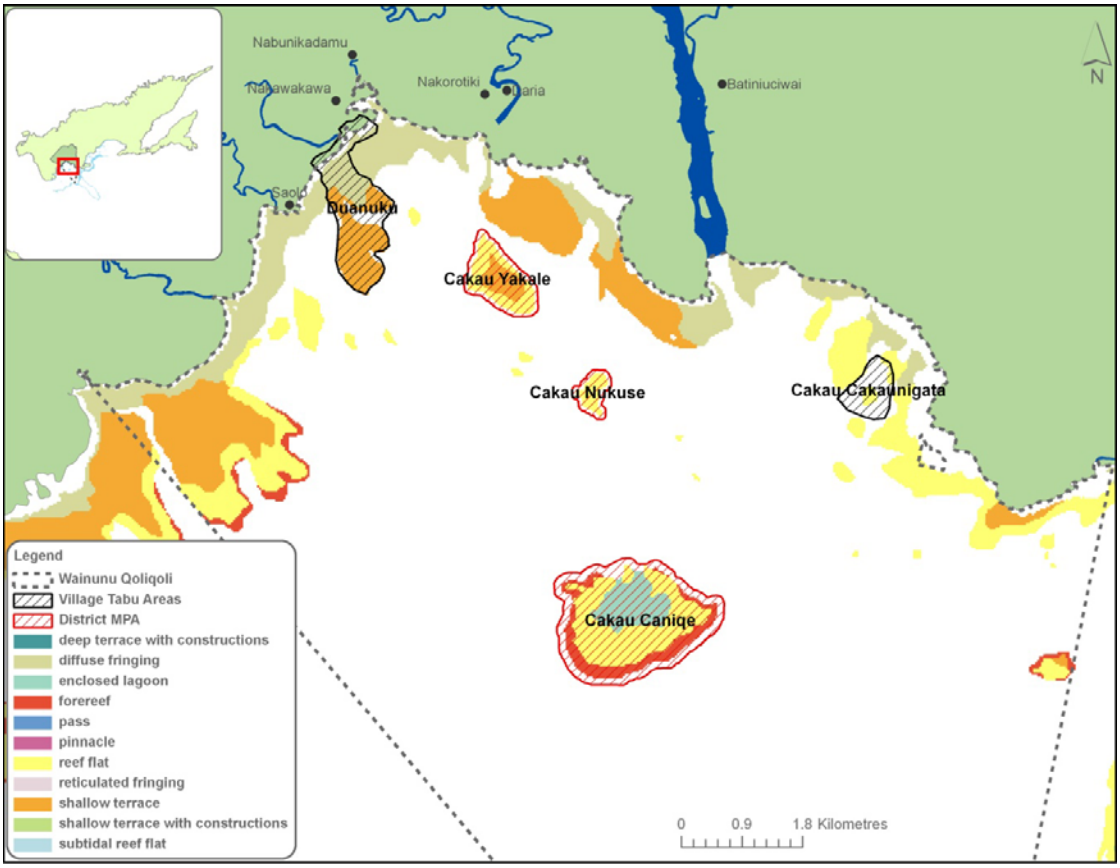


Figure 4.3 Marine protected areas in Wainunu district[74].

Table 4.7. Management rules for MPAs in Wainunu[75].

MPA	Rule	Exception	Management Responsibility
Duanuku	All types of fishing are prohibited inside the MPA and within a 50 m buffer zone around the reef.	Passing of Tui Wainunu	Saolo
Cakau Cakaunigata	All types of fishing are prohibited inside the MPA and within a 50 m buffer zone around the reef.	Passing of Tui Wainunu	District
Cakau Yakale	All types of fishing are prohibited inside the MPA and within a 50 m buffer zone around the reef.	Passing of Tui Wainunu	District
Cakau Nukuse	All types of fishing are prohibited inside the MPA and within a 50 m buffer zone around the reef.	Passing of Tui Wainunu	District
Cakau Caniqe	All types of fishing are prohibited inside the MPA and within a 100 m buffer zone around the reef.	Passing of Tui Wainunu	District

[74]Adopted at the WRMC Management Support Workshop in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (*Bose Vanua*) in March 2012.
[75]Adopted at the WRMC Management Support Workshop in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (*Bose Vanua*) in March 2012.

4.4.4 Management Rules for Marine Ecosystems

The following management rules apply across all of Wainunu's customary fishing grounds, as shown in **Table 4.8** below.

Table 4.8. Marine management rules for Wainunu customary fishing grounds.

Management Rule	Exception	National	District[76]	Management Action[77]
Night diving prohibited			✗	Monitoring by fish wardens. Report breaches to WRMC.
Leaving nets overnight (or for a period more than 1 tide) is prohibited			✗	Monitoring by fish wardens. Report breaches to WRMC.
Fishing for shark is prohibited			✗	Monitoring by fish wardens. Report breaches to WRMC.
The use of long line fishing is prohibited			✗	Monitoring by fish wardens. Report breaches to WRMC.
Removing coral is prohibited			✗	Monitoring by fish wardens. Report breaches to WRMC.
No catching fish during their breeding seasons and no fishing in breeding sites			✗	Monitoring by fish wardens. Report breaches to WRMC.
The use of dynamite is prohibited		✗[78]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Use of *derris* roots (fish poison) prohibited		✗[79]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Use of SCUBA and compressor is prohibited	Except for scientific survey and eco-tourism (diving) approved by WRMC and Tui Wainunu	✗[80]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Taking of undersized fish, smaller than their size limit is prohibited		✗[81]		Monitoring by fish wardens. Report breaches to WRMC.

[76] All district rules adopted by the WRMC in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (Bose Vanua) in March 2012
[77] See Section 5 for more detailed guidelines and protocols for monitoring and enforcement of management rules.
[78] *Fisheries Act* (Cap 158) s 10(4). Fines up to FJD5,000 and mandatory jail term for all convictions
[79] *Fisheries Regulations* r8 bans use of any derris or duva extract for fishing in Fiji
[80] Fisheries (Restrictions on use of Breathing Apparatus) Regulations 1997 r 4: anyone using or owning underwater breathing apparatus to catch fish is liable to a fine of $400 and/or imprisonment for six months

Management Rule	Exception	National	District[76]	Management Action[77]
Nets with mesh size less than 50 mm are prohibited[82]		✗[83]		Monitoring by fish wardens. Report breaches to WRMC.
Catching, eating or sale of humphead wrasse is prohibited		✗[84]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Catching turtles and collection of turtle eggs is prohibited		✗[85]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Fishing for 'trade or business' without a fishing licence is prohibited		✗[86]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Breaching the conditions of a fishing license is prohibited		✗[87]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Taking any of the protected marine species listed in Appendix 1 is prohibited.		✗[88]		Monitoring by fish wardens. Report breaches to Department of Environment.

[81] Catching fish that have not yet reproduced reduces the productivity of the fishery (see Appendix 3 for guidance on fish catch size limits)
[82] *Fisheries Regulations* r16 (hand nets with a mesh of 40mm can be used for freshwater prawns and nets with a mesh of 15mm can be used for sardines) – see Appendix 2 for net size limits
[83] *Fisheries Regulations* r16
[84] Endangered and Protected Species Act 2002
[85] The moratorium on taking of killing turtles contained in *Fisheries (Moratorium on Molesting, Taking or Killing of Turtles) Regulations 1997, r 20A*, which expired on 31 December 2008, was extended until 31 December 2018.
[86] *Fisheries Act (Cap 158) s 5(3)*
[87] *Fisheries Act (Cap 158) s 5(3)*
[88] *Fisheries Regulations*, *Endangered and Protected Species Act 2002 (see Appendix 1 for protected species list)*.

4.4.5 Management Activities for Marine Ecosystems

Table 4.9. Management activities for marine ecosystems in Wainunu district.[89]

ISSUE	ACTIVITY	IMPLEMENTATION	TIMEFRAME
SHORT TERM			
Protected areas haven't been officially established and blessed	Present plans to Tui Wainunu and the Bose Vanua for endorsement and arrange for blessing/opening ceremony	WRMC	Jun 2012
Communities and stakeholders need to be aware of MPA boundaries and understand all rules	Explain rules and MPA boundaries at village meetings.	WRMC Communication group	Mar-Apr 2012
	Consider whether/how MPA boundaries will be demarcated	WCS and village meetings	May 2012
	Identify key stakeholders and provide them with updated rules and maps of protected areas	WCS identify stakeholders and send rules and maps	Jun 2012
	Raise awareness of catch size limits and fish breeding seasons by producing and distributing size limit flyers/posters and fish rulers.	WRMC Communication group	Jun 2012
Need effective monitoring and enforcement to implement the management plan	Train and equip local fish wardens	Dept Fisheries to provide fish warden training	Apr 2012
	Identify and put in place local mechanisms for monitoring marine areas (particularly MPAs), recording any breaches of rules and feeding back to WRMC. Confirm this with villages through village meetings	WRMC Enforcement sub-group working with fish wardens and villages	Jul 2012
	Enforce rules and laws, reporting and acting upon breaches as appropriate	WRMC Enforcement sub-group working with fish wardens and villages	Jul 2012 onwards
MEDIUM / LONG TERM			
Need effective monitoring, enforcement and review of implementation	Record and report breaches or rules and laws	Fish wardens	Jul 2012 onwards
	Monitor the impact of the MPAs against the targets identified in Section 4.3.1 above	WCS and WRMC	Jul 2014
	Consider increasing the coverage of MPAs in Wainunu	WRMC	Jul 2014

[89] Identified at the WRMC Management Support Workshop, Nakawakawa, 28 February 2012.

4.4.6 Best practice Considerations for Marine Ecosystems

To maintain and restore the health, productivity and resilience of marine ecosystems, the following practices are recommended:

RECOMMENDATION	RATIONALE
Do not take fish or invertebrates that are gravid (e.g. large stomach fish, berried crustaceans).	Protecting gravid fish and crustaceans increases the productivity of the fishery.
Do not take fish in migratory 'bottlenecks' during peak migration seasons.	Targeting migrating fish in reef channels or estuaries reduces the productivity of the fishery.
Consider relocating giant clams to marine protected areas or *tabu* areas.	Protecting clams until they reach reproductive size will help local clam populations to recover.
Maintain spawning aggregations by protecting spawning sites, including reef channels	Protecting spawning aggregation sites increases the productivity of the fishery.
Do not take fish or invertebrates smaller than the Recommended Catch Size Limits listed in Appendix 3	Catching fish that have not yet reproduced reduces the productivity of the fishery.
If MPAs are opened, do not use nets with a mesh size less than 75 mm (except for small hand nets), limit take to amount likely to have accumulated during closure, leave the largest females to reseed the population, and shut down the harvest once the target has been reached	Periodic harvesting can affect species abundance and diversity, wiping out any conservation gains through the *tabu.*

5 COMPLIANCE AND ENFORCEMENT

5.1 PROMOTING COMPLIANCE

The management rules set out in this management plan represent a synthesis of community rules and national laws relevant to ecosystem management. The community rules are based on extensive consultation and have been endorsed by the Wainunu Hierarchy Council (*Bose Vanua*). The national laws were created by the national parliament, and are legally binding on all people throughout Fiji.

The Wainunu Resource Management Committee (WRMC) is responsible for coordinating activities to **raise awareness** of these management rules, and to **promote voluntary compliance** with the rules. WRMC is also aware of the need to **develop awareness and understanding** within local communities through their work. In particular, WRMC is responsible for:

- distributing one copy of this **management plan** to **every village** in the district.
- distributing copies of the **management rules** to **every household** in the district.
- organising **meetings** to explain the management rules in **every village** in the district.
- organising **meetings** in **neighbouring districts** to explain the management rules.
- producing **flyers** and other materials to **raise awareness** of the management rules.

WRMC will emphasise the benefits of the rules, and highlight the communities' common interest in sustainable management of natural resources and ecosystems in the district.

WRMC will work with chiefs, church leaders, government officers and other stakeholders to promote awareness of, and respect for, the management rules.

The WRMC Communications sub-committee will take a leading role on delivering these tasks.[90]

5.2 MONITORING AND SURVEILLANCE

WRMC is responsible for coordinating monitoring and surveillance activities to identify breaches of the rules set out in this management plan. This task will be delegated to the Enforcement sub-committee[91], which will be specifically responsible for:

- ensuring adequate training of community fish wardens;
- securing adequate resources and equipment for marine patrols;
- establishing a monitoring and surveillance program to identify breaches of management rules for terrestrial, freshwater and estuarine ecosystems; and
- ensuring adequate recording and reporting of breaches.

[90] See section 6.2.1 for an outline of WRMC sub-committee, roles and functions.
[91] See section 6.2.1 for an outline of WRMC sub-committee, roles and functions.

5.3 ENFORCEMENT

The options available for enforcement of management rules will depend on whether the rule is a community rule and/or a national law. The management rule tables in this management plan indicate whether each rule is a national law or a district community rule.

For example, in the extract below (Table 5.1):

- diving at night is prohibited by a community rule; and
- dynamite fishing is prohibited by a national law.

The footnotes to the table identify the source of the management rule.

Table 5.1. Extract from the marine rules table (Table 4.8, pages 36-37), illustrating how rules are referenced by their source.

Management Rule	Exception	National	District	Management Action
Night diving prohibited			✗[92]	Monitoring by fish wardens. Report breaches to WRMC.
Leaving nets overnight (or for a period more than 1 tide) is prohibited			✗[93]	Monitoring by fish wardens. Report breaches to WRMC.
Fishing for shark is prohibited			✗[94]	Monitoring by fish wardens. Report breaches to WRMC.
The use of dynamite is prohibited		✗[95]		Monitoring by fish wardens. Report breaches to Fisheries Department.
Nets with mesh size less than 50 mm are prohibited[96]		✗[97]		Monitoring by fish wardens. Report breaches to WRMC.
Catching, eating or sale of humphead wrasse is prohibited		✗[98]		Monitoring by fish wardens. Report breaches to Fisheries Department.

[92] Adopted by the WRMC in Nakawakawa, February 2012, and approved by the Wainunu Hierarchy Council (Bose Vanua) in March 2012.
[93] Adopted by the WRMC, Nakawakawa February 2012, and approved by the Bose Vanua in March 2012.
[94] Adopted by the WRMC, Nakawakawa February 2012, and approved by the Bose Vanua in March 2012.
[95] *Fisheries Act* (Cap 158) s 10(4). Fines up to FJD5,000 and mandatory jail term for all convictions.
[96] *Fisheries Regulations* r16 (hand nets with a mesh of 40mm can be used for freshwater prawns and nets with a mesh of 15mm can be used for sardines) – see Appendix 2 for net size limits.
[97] *Fisheries Regulations* r16.
[98] Endangered and Protected Species Act 2002.

5.3.1 ENFORCEMENT OF NATIONAL LAWS

The WRMC Enforcement sub-committee will play a leading role in enforcing the rules within this management plan.

Government officers and police are responsible for enforcing national laws. Courts may impose penalties for breaches of national laws, including fines and prison sentences, and may make other orders, including cancellation of certain types of licence.[99] In some cases, government agencies have the power to suspend or cancel licences[100] or issue binding orders and notices.[101]

Members of the public, including resource owners, can improve law enforcement by monitoring and reporting breaches, and advocating for stricter enforcement by government.

COMMUNITY FISH WARDENS

Community fish wardens play a special role in enforcement of the *Fisheries Act*. Fish wardens who have been appointed by the Permanent Secretary for Fisheries have the legal power to:

- order a person to display their fishing licence, gear or catch;
- board and search fishing vessels; and
- if they reasonably suspect that an offence has been committed, take the offender, the vessel, gear and catch to the nearest police station or port.

Obstructing a fish warden from boarding and searching a vessel is a criminal offence.[2]

It is important to note that fish wardens only have the power to enforce the *Fisheries Act*. They do **not** have the legal power to enforce other legislation or community rules.

Fisheries Act, s.7(1).
[2] *Fisheries Act*, s.7(2).

Detaining or assaulting a person or taking their things without legal authority is a criminal offence. This means, for example, that it is illegal to seize a fishing vessel only because it was found fishing in a tabu area.

If a community rule has been breached, it may be useful to investigate whether a national law has also been breached. For example, if a vessel is found fishing in a tabu area, investigate whether the vessel has been fishing for trade or business without a licence, using a prohibited fishing method (e.g. poison, dynamite, undersized nets) or taking legally protected fish (e.g. undersized fish).

[99] For example, fishing licences may be cancelled if the court finds the licence holder guilty of a fisheries offence: *Fisheries Act,* s 8.
[100] For example, the Conservator for Forests may revoke a logging licence if a breach has occurred or is likely to occur: *Forest Decree,* s 19.
[101] For example, the Director of Environment may issue a prohibition notice to prevent an immediate threat or risk to the environment: *Environment Management Act 2005*, s 21.

If you believe that a national law has been breached, the following **enforcement protocol** should be followed:

1. Report the incident to the WRMC, providing as much detail as possible, including:

    - description of the incident
    - location of the incident
    - time and date of the incident
    - name and contact details of the alleged offender
    - registration number of the offender's vessel or vehicle
    - names and contact details of any witnesses
    - photographs, video and/or physical evidence.

2. If WRMC believes that a law has been breached WRMC may report the breach to the police and/or relevant government agency. Relevant government agencies are identified in the management rule tables.

3. WRMC must record the details of any report that it makes to the police and/or government agency, including the name and contact details of the officer who received the report.

4. WRMC must record the details of any action taken by the police or government agency (e.g. investigation, verbal warning, cancellation of licence, prosecution).

5. If WRMC is dissatisfied with the response of the police or government agency, WRMC may:
    - contact the relevant officer's supervisor;
    - report the lack of action to the *Bose Vanua*;
    - report the lack of action to partner organisations; and/or
    - report the lack of action to the media.

In any case, WRMC may also initiate the community-based enforcement protocol described in the following section 5.3.2.

5.3.2 ENFORCEMENT OF COMMUNITY RULES

Community-based rules must be enforced in a manner that does not breach national laws. It is a criminal offence to assault or detain a person or take their property without legal authority. This means, for example, that it is illegal to seize a vessel only because it was found fishing in a *tabu* area.

If a community rule has been breached, the following **enforcement protocol** should be followed:

1. Report the breach to the WRMC, providing as much detail as possible, including:

    - description of the incident
    - location of the incident
    - time and date of the incident
    - name and contact details of the alleged offender
    - registration number of the offender's vessel or vehicle
    - names and contact details of any witnesses
    - photographs, video and/or physical evidence.

2. WRMC must attempt to contact the person alleged to have breached the rule, to inform them of the alleged breach and to ask them to explain their side of the story.

3. If WRMC believes that a community rule has been breached, WRMC must inform the *Bose Vanua* of the breach, and may recommend an enforcement response.

4. If the *Bose Vanua* believes that a community rule has been breached, it may order such enforcement action(s) as it considers appropriate within the bounds of the law, including, but not limited to:

    - a verbal or written warning
    - taking the offender to task in a village meeting
    - ordering the offender to perform a community service
    - in the case of a licensed fishing vessel, placing the offender on notice that the Tui Wainunu will not issue a letter of consent for them or their vessel for a fixed period.

Note: This enforcement protocol may also be used for breaches of national laws, especially in cases where WRMC considers the response of the police or relevant government agency to be inadequate.

6 MANAGEMENT INSTITUTIONS

6.1 WAINUNU HIERARCHY COUNCIL

The Wainunu Hierarchy Council (*Bose Vanua*) consists of the paramount chief (*Tui Wainunu*) and clan chiefs (*turaga ni yavusa*) of Wainunu.

The communities of Wainunu recognise the traditional authority of the Bose Vanua to make decisions in relation to a wide range of matters affecting community life, including the use and management of natural resources.

The Bose Vanua has formally endorsed this management plan, and entrusts the Wainunu Resource Management Committee with primary responsibility for its implementation.

6.2 WAINUNU RESOURCE MANAGEMENT COMMITTEE

The Wainunu Resource Management Committee (WRMC) consists of at least one representative from each village, nominated by their village and appointed by the Bose Vanua.

WRMC representatives may be appointed for a three year term, with the option of reappointment for a further three years. The position of chair of WRMC is a six year term. All terms begin from March 2012, when the Bose Vanua approved the first draft Wainunu Ecosystem-based Management Plan. No representative may serve on the committee for more than six years.

The purpose of the committee is to promote and support sustainable management of natural resources in Wainunu district. The functions of the committee are:

- to coordinate **implementation** of the management activities identified in this management plan;
- to **raise awareness** of the management rules and activities set out in this management plan;
- to coordinate **enforcement** of the management rules set out in this management plan;
- to assess proposed **resource use and development activities**, to ensure they are consistent with this management plan, national laws and ecosystem-based management principles;
- to provide **information and advice** on resource management and alternative livelihoods;
- to **organise training** on sustainable resource management and alternative livelihoods;
- to **liaise with stakeholders**, including resource users, conservation partners and donors;
- to transparently **manage and distribute funds** for resource management and other activities; and
- to **monitor and report** to resource owners and stakeholders on implementation of this plan.

WRMC protocols were adopted at the Management Support Workshop in Nakawakawa in February 2012. The WRMC committee was also elected at this workshop and its membership is outlined in **Table 6.1** below:

Table 6.1. Wainunu Resource Management Committee, membership and office bearers.

Names	*Village*	*Position in Village*	*Ph.*
Chairman			
Mosese Ratagau	Nakorotiki	Lewenikoro	9351583
Vice-chairman			
Maritino Voreqe	Daria	Turaga Ni Yavusa	8204981
Secretary			
Ratu Veli Tokaduadua	Nakawakawa	Turaga ni koro/Ovisa ni Qoliqoli	8435177
Assistant Secretary			
Mereani Baleiwai	Nabunikadamu	Kindergarten teacher	8208389
Treasurer			
Tomasi Dyer	Nadua	Turaga ni koro	8200859
Committee members			
Inosi Dawai	Navakasali	Turaga Ni Yavusa	8200269
Rupeni Veivoki	Navakasali	Turaga ni Mataqali	8200269
Nemani Dreunikarawa	Daria	lewenikoro	8204981
Akuila Ramotumotu	Nakorotiki	Turaga ni Koro	8204981
Sireli Ganivatu	Nabunikadamu	lewenikoro	8200433
Kinijoji Tuiwainunu	Nakawakawa	lewenikoro	8435177
Epeli Matawalu	Nakawakawa	Mata ni Tikina - Vakacegu	
Serupepeli Veilawa	Nakawakawa	Mata Ni Tikina	8403711
Manasa Raso	Nakawakawa	Vakatawa	8206243
Joeli Varani	Nadua	Turaga ni Mataqali	
Bill Brown	Batinivuriwai	lewenikoro	9510123
Solomoni Bura	Batinivuriwai	lewenikoro	8203526
Iliesa Ratusake	Nakawakawa	Turaga ni Yavusa	
Valetino Ruge	Nakawakawa	Turaga ni Koro	
Manoa Rerevakarua	Cogea		
Solomone Uarua	Saolo		
Sireli Bukavata	Saolo		
Roger Simpson	Nakabuta		

WRMC will meet four times per year, and may hold additional meetings as necessary. Committee members from at least 6 of Wainunu's 9 villages and settlements must be present to make decisions. The WRMC Chair reports to the *Bose Vanua* and attends *Bose Vanua* meetings as an observer.

6.2.1 WRMC SUB-COMMITTEES

The WRMC established separate sub-committees for Enforcement and Awareness at their Management Support Workshop in Nakawakawa on 29 February 2012

WRMC members will discuss the formation and functions of the sub-committees in a village meeting in each village, and invite community members to express an interest in joining a sub-committee. The members of each sub-committee will be selected and appointed by the chair of that sub-committee, and should include at least three community members.

Sub-committee members may be appointed for a three year term, with the option of reappointment for a further three years. No person may serve on the same sub-committee for more than six years.

Each sub-committee is chaired by a member of the WRMC, who will call together the sub-committee to meet as necessary, and is required to report regularly to the WRMC. The functions and responsibilities of the sub-committees are outlined below.

WRMC SUB-COMMITTEE FUNCTIONS	
ENFORCEMENT SUB-COMMITTEE	**AWARENESS SUB-COMMITTEE**
Coordinating patrols and enforcement Establishing systems and collecting infringement data Support networking and collaboration between fish wardens Compiling reports on infringement data	Developing communication protocols Coordinating village visits Implementing awareness programs Liaising with other organisations on awareness issues Gathering information for local stories in the EBM newsletter Marketing and promotion

The WRMC will consider formation of new sub-committees as its workload requires. These are likely to have a similar structure and act as a tool to progress distinct areas of work associated with implementing the management plan.

7 MANAGEMENT ROLES AND PROCESSES

7.1 IMPLEMENTATION OF THE MANAGEMENT PLAN

The WRMC bears overall responsibility for implementation of this management plan. The committee is accountable to the Wainunu Hierarchy Council (*Bose Vanua*) for timely and effective implementation of the plan, in collaboration with local communities (*vanua*), village leaders, civil society partners, government agencies and the private sector.

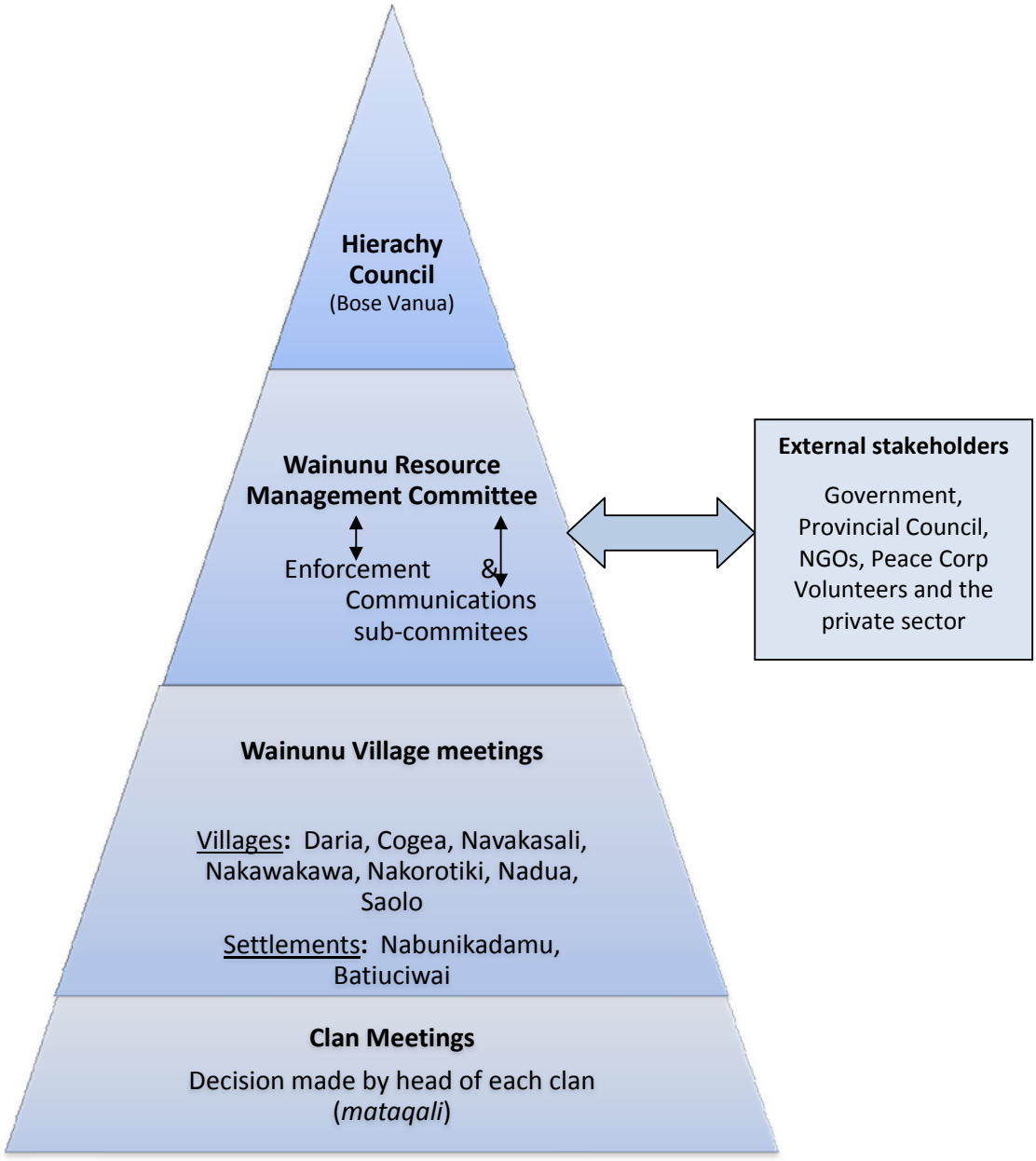


Figure 7.1. The relationships between Wainunu Resource Management Committee, the district Hierarchy Council, villages and clans.

7.1.1 MANAGEMENT RULES

The Wainunu Resource Management Committee is responsible for raising awareness of the management rules set out in this plan, monitoring compliance with the rules and taking action to ensure enforcement of the rules.

The management rules provide for certain decisions to be made by persons other than the WRMC. For example, certain village *tabu* areas may be opened by the relevant local Chiefs (*turaga-ni-yavusa)*. In such cases, decision must be communicated to the WRMC as soon as practicable to ensure they are able to effectively monitor overall implementation of the management plan.

7.1.2 MANAGEMENT ACTIVITIES

The Wainunu Resource Management Committee is responsible for liaising with the responsible stakeholder(s) identified for each management activity to ensure that the activity is completed in a timely and effective manner.

7.1.3 SUSTAINABLE FINANCING

This management plan aims to support long-term sustainable development in Wainunu by maintaining the health and productivity of the district's ecosystems. It acknowledges that most village households rely on those ecosystems as their primary source of food and income.

Communities' commitment to the process will depend to a large degree on how they perceive it to be affecting their income and quality of life. As such, WRMC aspires to develop new sources of income generation linked to EBM activities with which to support local sustainable development initiatives, such as:

- scholarships for tertiary education;
- small grants and loans for sustainable microenterprise initiatives; and
- management and restoration of terrestrial, freshwater and marine ecosystems.

Professional, transparent accounting and reporting is needed to ensure efficient and equitable use of funds, and to support sustainable resource management and community development.

Scoping is required to identify appropriate activities with income generating potential and business planning will be essential to realise any opportunities arising.

7.2 AMENDMENT OF THE MANAGEMENT PLAN

The process for amending this management plan varies depending on the nature of the amendment.

7.2.1 DISTRICT-LEVEL MANAGEMENT RULES

For amendments to **district-level management rules** – that is, rules that apply throughout the district and to the District MPA:

1. The proposed amendment must be **submitted in writing** to the WRMC.

2. The WRMC Chair must **present** the proposed amendment to the *Bose Vanua*.

3. The *Bose Vanua* may instruct the WRMC to **consult** with resource owners and/or external stakeholders in relation to the amendment.

4. If the *Bose Vanua* instructs the WRMC to consult with **resource owners**, WRMC members must raise the proposed amendment at **village meetings** in every village in the district.

5. If the *Bose Vanua* instructs the WRMC to consult with **stakeholders**, WRMC must provide **written notice** to all relevant stakeholders, and allow a reasonable period for comment.

6. The WRMC Chair must report to the *Bose Vanua* on **consultation outcomes**.

7. The *Bose Vanua* may **reject** or **approve** the amendment.

8. If the *Bose Vanua* **rejects** the amendment, the WRMC must:

    a. post a **written notice** in the village hall in each village in the district; and
    b. provide **written notice** to all relevant external stakeholders.

9. If the *Bose Vanua* **approves** the amendment, the WRMC must:

    a. explain the amendment in a **village meeting** in each village in the district.
    b. post a **written notice** in the village hall in each village in the district;
    c. provide **written notice** to all relevant external stakeholders; and
    d. insert a copy of the written notice in each copy of this **management plan**.

7.2.2 VILLAGE-LEVEL MANAGEMENT RULES

For amendments to **village-level management rules** – that is, rules that only apply to a particular village, or to designated village *tabu* areas:

1. The proposed amendment must be **approved** by the village chief (*turaga ni yavusa*).

2. If the rules only apply to the land of a particular clan (*mataqali)* – a proposed amendment must be approved by head of that clan. The head of the clan must provide written notice of the amendment to the village chief.

3. The village chief must provide written notice of any amendment to the Bose Vanua.

4. The WRMC must:
    a. explain the amendment in a **village meeting** in each village in the district.
    b. post a **written notice** in the village hall in each village in the district;
    c. provide **written notice** to all relevant external stakeholders; and
    d. insert a copy of the written notice in each copy of this **management plan**.

7.2.3 OTHER AMENDMENTS

Other amendments may be made as necessary by the WRMC, with the approval of the *Bose Vanua*.

The WRMC must provide written notice to external stakeholders of any changes to the management plan, and insert a copy of the notice in each copy of the management plan, including the copy kept by each village.

7.3 REVIEW OF THE MANAGEMENT PLAN

This management plan will be reviewed, and amended as necessary, every five (5) years. However, if a need arises to amend the plan before this time, then the early amendment can take place with the approval of WRMC.

The review process must provide an opportunity for village representatives and other relevant stakeholders to comment on the content and implementation of the management plan.

The proposed amendments must be endorsed by the WRMC and the *Bose Vanua*.

Copies of the amended management plan must be distributed to each village in the district and all members of the stakeholder consultative group.

8 EXTERNAL STAKEHOLDERS

A wide range of stakeholders can affect, or can be affected by, the use, conservation and management of land and natural resources in Wainunu district. This section outlines those stakeholders engaged in the management planning process to date. With a strong commitment to partnership approaches, WRMC will engage more stakeholders across public, private and non-governmental sectors as it develops further and in the course of implementation.

8.1 GOVERNMENT AGENCIES

BUA PROVINCIAL COUNCIL

Bua Provincial Council assisted the organisation and facilitation of community engagement in the processes of developing this management plan. Their continued support will be important to ensure future engagement of relevant stakeholders and synchronisation with other activities in the province.

DEPARTMENT OF FISHERIES

The Department of Fisheries is responsible for promoting the sustainable use and management of fisheries resources. The Department bears statutory responsibility for administering and enforcing the *Fisheries Act*, including issuing fishing licences, declaring restricted fishing areas and responding to illegal fishing activities. The Department also provides fisheries extension and training services.

DEPARTMENT OF FORESTRY

The Department of Forestry is responsible for promoting the sustainable use and management of forest resources. The Department bears statutory responsibility for administering and enforcing the *Forest Decree*, including issuing logging licences, declaring forest reserves and responding to illegal logging activities. The Department also provides forestry extension and training services.

DEPARTMENT OF AGRICULTURE AND LAND USE PLANNING

The Department of Agriculture seeks to promote a productive and sustainable agricultural sector. The Department provides extension services and advice in relation to farm management, soil and water conservation, sustainable farming methods, alternative livelihoods and rural microfinance.

DEPARTMENT OF ENVIRONMENT

The Department of Environment is responsible for promoting environmental protection and sustainable natural resource use. The Department is responsible for administering and enforcing the *Environment Management Act 2005*, including provisions dealing with environmental impact assessment of development proposals (e.g. tourist resorts, forestry, mining) and pollution control. The Department is also responsible for formulation and implementation of national environmental policies, including the National Biodiversity Strategy and Action Plan and Climate Change Policy.

MINISTRYOF TOURISM

The Ministry of Tourism is responsible for promoting tourism development, including sustainable tourism in rural areas. The Ministry provides advice and extension service for individuals and communities interested in developing local tourism enterprises, and provides marketing support for existing tourism enterprises.

MINISTRY OF HEALTH

The Ministry of Health is responsible for delivery of medical care (including rural health services), and public health programs (including disease control, health promotion and environmental health). The Ministry seeks to improve environmental health by monitoring pollution and promoting safe water supply and sanitation (including rural toilet upgrading). The Ministry, together with local authorities, is responsible for administering and enforcing the *Public Health Act* [Cap 111].

ITAUKEI LANDS AND FISHERIES COMMISSION

The iTaukei Lands and Fisheries Commission was established to register ownership of *iTaukei* lands and customary fishing grounds. The commission is empowered under the *iTaukei Lands Act* (formerly *Native Lands Act)* and *Fisheries Act* to resolve disputes in relation to *iTaukei* land and fishing rights, and is the custodian of the *iTaukei* land register and the register of customary fishing rights.

I-TAUKEI AFFAIRS BOARD

The *iTaukei* Affairs Board was established by the *iTaukei Affairs Act* and is responsible for the aspirations of *iTaukei* (indigenous Fijians) and acts as a repository for information pertaining to their good governance and wellbeing. The board develops, implements and monitors policies and programs to ensure the good governance and well being of the *iTaukei*.

ITAUKEI LANDS TRUST BOARD

The iTaukei Lands Trust Board (TLTB, formerly Native Lands Trust Board) is empowered to grant leases over *iTaukei* land under the *iTaukei Lands Trust Act*. The TLTB must exercise its powers for the benefit of the landowners, and may issue *iTaukei* land leases subject to conditions. TLTB is responsible for ensuring compliance with lease conditions, and may cancel any land lease if the conditions of the lease are breached.

POLICE FORCE

The police are responsible for maintaining law and order, preserving the peace, protecting life and property, preventing and detecting crime, and enforcing all laws and regulations with which they are directly charged. Police have a general duty to prevent the commission of any offence,[102] and are specifically empowered to enforce the *Fisheries Act*[103] and the *Forest Decree*.[104] Official police force policy encourages the reporting of offences by members of the public. The nearest police stations to Wainunu are located in Nabouwalu and Savusavu.

[102] *Criminal Procedure Code*, s.51.
[103] *Fisheries Act,* s.7, Power of inspection and detention.
[104] *Forest Decree,* ss.34-36, Power of inspection, Power of arrest, Power of seizure.

8.2 NON-GOVERNMENT ORGANISATIONS

WILDLIFE CONSERVATION SOCIETY

The Wildlife Conservation Society (WCS) is committed to the conservation of wild animals and wild places around the world. The WCS approach emphasises scientific research, capacity-building, strong partnerships and local engagement. The WCS Fiji Country Program works closely with communities in Wainunu district to promote and support ecosystem-based management, by conducting scientific and social research and facilitating community-based management planning processes.

PEACE CORPS

The Peace Corps, an American volunteer programme, has placed 2,200 volunteers in Fiji since 1968. Placements usually last 24 months and cover integrated environmental resource management and community health promotion. Peace Corps Volunteers have been involved in activities linking with the development and implementation of this management plan.

9 APPENDICES

APPENDIX 1 – PROTECTED SPECIES

The following species are legally protected throughout Fiji. Possessing, selling or exporting these species without a permit is a criminal offence.

PART 1 – PROTECTED MARINE AND FRESHWATER FAUNA

SCIENTIFIC NAME	COMMON NAME	FIJIAN NAME	LEGISLATION
FISH SPECIES			
Bryaninops dianneae	Species of goby		*Endangered and Protected Species Act 2002*, s.3(d)
Ecsenius fijiensis	Species of blenny		*Endangered and Protected Species Act 2002*, s.3(d)
Mesopristes kneri		Reve	*Endangered and Protected Species Act 2002*, s.3(d)
Plagiotremus laudandus flavus	Species of blenny		*Endangered and Protected Species Act 2002*, s.3(d)
Plectranthias fijiensis	Species of sea bass		*Endangered and Protected Species Act 2002*, s.3(d)
Rotuma lewisi	Species of common wriggler		*Endangered and Protected Species Act 2002*, s.3(d)
Thamnaconus fijiensis	Species of filefish		*Endangered and Protected Species Act 2002*, s.3(d)
Cheilinus undulatus	Humphead wrasse		*Endangered and Protected Species Act 2002*, s.3(e)
Epinephelus lanceolatus	Giant Grouper		*Endangered and Protected Species Act 2002*, s.3(e)
Bathygobius petrophilus			*Endangered and Protected Species Act 2002*, s.3(e)
Hippocampus kuda	Spotted seahorse		*Endangered and Protected Species Act 2002*, s.3(e)
Lairdina hopletupus			*Endangered and Protected Species Act 2002*, s.3(e)
Meiacanthus bundoon			*Endangered and Protected Species Act 2002*, s.3(e)
Parmops echinatus			*Endangered and Protected Species Act 2002*, s.3(e)
Redigobius leveri			*Endangered and Protected Species Act 2002*, s.3(e)
Redigobius sp			*Endangered and Protected Species Act 2002*, s.3(e)
Siganus uspi			*Endangered and Protected Species Act 2002*, s.3(e)
MARINE REPTILES			
Cheloniidae spp.	Green turtle		*Endangered and Protected Species Act 2002*, s.3(a)
Dermochelys coriacea	Leatherback turtle		*Endangered and Protected Species Act 2002*, s.3(a)
Eretmochelys imbricate	Hawksbill turtle		
Caretta caretta	Loggerhead turtle		
Natator depressus	Flatback turtle		
Lepidochelys olivacea	Olive Ridley turtle		

MARINE MAMMALS			
Phocaena spp.	Dolphin		*Fisheries Regulations*, r.25
Delphis spp.	Porpoise		*Fisheries Regulations*, r.25
MARINE INVERTEBRATES			
Charonia tritonis	Davui shell		*Fisheries Regulations*, r.22
Cassis cornuta	Giant helmet shell		*Fisheries Regulations*, r.23
CORALS			
Antipatharia spp.	Black corals		*Endangered and Protected Species Act 2002*, s.3(b)
Helioporidae spp.	Blue corals		*Endangered and Protected Species Act 2002*, s.3(b)
Scleractinia spp.	Stony corals		*Endangered and Protected Species Act 2002*, s.3(b)
Tubiporidae spp.	Organ pipe corals		*Endangered and Protected Species Act 2002*, s.3(b)
Milleporidae spp.	Fire corals		*Endangered and Protected Species Act 2002*, s.3(b)
Stylasteridae spp.	Lace corals		*Endangered and Protected Species Act 2002*, s.3(b)
SEABIRDS			
Fregata ariel	Lesser frigatebird	Manumanunicagi	*Endangered and Protected Species Act 2002*, s.3(d)
Nesofregetta albigularis	Polynesian storm-petrel		*Endangered and Protected Species Act 2002*, s.3(d)
Phethon lepturus	White-tailed tropicbird	Lawedua	*Endangered and Protected Species Act 2002*, s.3(d)
Procelsterna cernula	Blue noddy		*Endangered and Protected Species Act 2002*, s.3(d)
Pseudobulweria macgillivrayi	Fiji petrel	Kacau ni Gau	*Endangered and Protected Species Act 2002*, s.3(d)
Pseudobulweria rostrata	Tahiti petrel	Kacau ni Taiti	*Endangered and Protected Species Act 2002*, s.3(d)
Puffinus inherminieri	Audubon's shearwater		*Endangered and Protected Species Act 2002*, s.3(d)
Sula dactylatra	Masked booby	Toro	*Endangered and Protected Species Act 2002*, s.3(d)
Sula leucogaster	Brown booby	Toro	*Endangered and Protected Species Act 2002*, s.3(d)
Sterna anaethetus	Bridled tern		*Endangered and Protected Species Act 2002*, s.3(d)
Sterna bergii	Crested tern	Idre	*Endangered and Protected Species Act 2002*, s.3(d)
Sterna fuscata	Sooty tern		*Endangered and Protected Species Act 2002*, s.3(d)

PART 2 – PROTECTED TERRESTRIAL FAUNA

SCIENTIFIC NAME	COMMON NAME	FIJIAN NAME	LEGISLATION
MAMMALS			
Emballonura semicaudata	Polynesian sheath tailed bat		*Endangered and Protected Species Act 2002*, s.3(d)
Notopteris macdonaldi	Fijian blossom bat		*Endangered and Protected Species Act 2002*, s.3(d)
Pteralopex acrodonta	Taveuni flying fox		*Endangered and Protected Species Act 2002*, s.3(d)
Chaeropon bregullae	Fijian mastiff bat		*Endangered and Protected Species Act 2002*, s.3(e)
BIRDS			
Clytorhynchus nigrogularis	Black-faced shrikebill	Kiro	*Endangered and Protected Species Act 2002*, s.3(d)
Dendrocygna arcuata	Wandering whistling-duck	Gadamu	*Endangered and Protected Species Act 2002*, s.3(d)
Erythrura kleinschmidti	Pink-billed parrotfinch	Sitibatitabua	*Endangered and Protected Species Act 2002*, s.3(d)
Gallicolumba stairii	Friendly ground-dove	Qilu	*Endangered and Protected Species Act 2002*, s.3(d)
Lamprolia victoria	Silktail	Sisi	*Endangered and Protected Species Act 2002*, s.3(d)
Mayrornis versicolor	Ogea monarch		*Endangered and Protected Species Act 2002*, s.3(d)
Myzomela chermesina	Rotuma myzomela	Armea	*Endangered and Protected Species Act 2002*, s.3(d)
Nesoclopeus poecilopterus	Barred-wing rail	Saca	*Endangered and Protected Species Act 2002*, s.3(d)
Poliolimnas cinereus	White-browed crake		*Endangered and Protected Species Act 2002*, s.3(d)
Porzana tabuensis	Spotless crake	Mo	*Endangered and Protected Species Act 2002*, s.3(d)
Trichocichla rufa	Long-legged warbler	Manu Kalou	*Endangered and Protected Species Act 2002*, s.3(d)
Aerodramus spodiopygia	White rumped swiftlet	Kakabacea	*Endangered and Protected Species Act 2002*, s.3(e)
Anas superciliosa	Pacific black duck	Ganiviti	*Endangered and Protected Species Act 2002*, s.3(e)
Aplonis tabuensis	Polynesian starling	Vocea	*Endangered and Protected Species Act 2002*, s.3(e)
Ardea novaehollandiae	White faced heron	Belomatavula	*Endangered and Protected Species Act 2002*, s.3(e)
Artamus mentalis	Fiji woodswallow	Kiro	*Endangered and Protected Species Act 2002*, s.3(e)
Butorides striatus	Mangrove heron	Gadamu	*Endangered and Protected Species Act 2002*, s.3(e)
Cacomantis pyrrophanus	Fan tailed cuckoo	Sitibatitabua	*Endangered and Protected Species Act 2002*, s.3(e)
Cettia ruficapilla	Fiji bush warbler	Qilu	*Endangered and Protected Species Act 2002*, s.3(e)
Clytorhynchus vitiensis	Lesser shrikebill	Sisi	*Endangered and Protected Species Act 2002*, s.3(e)
Columba vitiensis	White throated pigeon		*Endangered and Protected Species Act 2002*, s.3(e)
Ducala latrans	Barking pigeon	Armea	*Endangered and Protected Species Act 2002*, s.3(e)
Cucula pacifica	Pacific pigeon	Saca	*Endangered and Protected Species Act 2002*, s.3(e)
Egretta sacra	Reef heron		*Endangered and Protected Species Act 2002*, s.3(e)
Erythrura pealii	Fiji parrotfinch	Mo	*Endangered and Protected Species Act 2002*, s.3(e)

Foulehaio carunculata	Wattled honeyeater	Manu Kalou	*Endangered and Protected Species Act 2002*, s.3(e)
Gallirallus philippensis	Banded rail	Kakabacea	*Endangered and Protected Species Act 2002*, s.3(e)
Gymnomyza viridis	Giant forest honeyeater	Ganiviti	*Endangered and Protected Species Act 2002*, s.3(e)
Halcyon chloris	White collared kingfisher	Vocea	*Endangered and Protected Species Act 2002*, s.3(e)
Hirundo tahitica	Pacific swallow	Belomatavula	*Endangered and Protected Species Act 2002*, s.3(e)
Lalage maculosa	Polynesian triller	Kiro	*Endangered and Protected Species Act 2002*, s.3(e)
Mayrornis lessoni	Slaty monarch	Gadamu	*Endangered and Protected Species Act 2002*, s.3(e)
Myiagra azureocapilla	Blue crested broadbill	Batidamu	*Endangered and Protected Species Act 2002*, s.3(e)
Myiagra vanikorensis	Vanikoro broadbill	Matayalo	*Endangered and Protected Species Act 2002*, s.3(e)
Myzomela jugularis	Orange breasted myzomela	Delakula	*Endangered and Protected Species Act 2002*, s.3(e)
Pachycephala pectorulis	Golden whistler	Ketedromo	*Endangered and Protected Species Act 2002*, s.3(e)
Petroica multicolor	Scarlet robin	Diriqwala	*Endangered and Protected Species Act 2002*, s.3(e)
Phigys solitarius	Collared lorry	Kula	*Endangered and Protected Species Act 2002*, s.3(e)
Ptilinopus layardi	Whistling dove	Soqeda	*Endangered and Protected Species Act 2002*, s.3(e)
Ptilinopus luteovirens	Golden dove	Bunako	*Endangered and Protected Species Act 2002*, s.3(e)
Ptilinopus perousii	Many coloured fruit dove	Kuluvotu	*Endangered and Protected Species Act 2002*, s.3(e)
Ptilinopus porphyraceus	Crimson crowned fruit dove	Kuluvotu	*Endangered and Protected Species Act 2002*, s.3(e)
Ptilinopus victor	Orange dove	Bune	*Endangered and Protected Species Act 2002*, s.3(e)
Rhipidura personata	Kadavu fantail		*Endangered and Protected Species Act 2002*, s.3(e)
Rhipidura spilodera	Streaked fantail	Sasaira	*Endangered and Protected Species Act 2002*, s.3(e)
Turdus poliocephalus	Island thrush	Tola	*Endangered and Protected Species Act 2002*, s.3(e)
Xanthotis provocator	Kadavu honeyeater	Kikou	*Endangered and Protected Species Act 2002*, s.3(e)
Zosterops exploratory	Fiji white eyes	Qiqi	*Endangered and Protected Species Act 2002*, s.3(e)
Zosterops lateralis	Silvereye	Qiqi	*Endangered and Protected Species Act 2002*, s.3(e)
REPTILES			
Hemiphyllodacrylus typus	Indo pacific tree gecko		*Endangered and Protected Species Act 2002*, s.3(d)
Emoia Campbelli	Montane tree skink		*Endangered and Protected Species Act 2002*, s.3(d)
Emoia mokosariniveikau	Turquoise tree skink		*Endangered and Protected Species Act 2002*, s.3(d)
Emoia nigra	Pacific black skink		*Endangered and Protected Species Act 2002*, s.3(d)
Leiolopisma alazon	Lauan ground skink		*Endangered and Protected Species Act 2002*, s.3(d)
Gehyra mutilata	Stumped toed gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Gehyra oceanica	Oceanic gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Gehyra vorax	Giant forest gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Hemidactylus frenatus	House gecko		*Endangered and Protected Species Act 2002*, s.3(e)

Hemidactylus garnotii	Fox gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Lepidodactylus gardineri	Rotuman gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Lepidodactylus lugubris	Mourning gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Lepidadactylus manni	Mann's forest gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Nactus pelagicus	Pacific slender toed gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Cyptablepharus eximius	Pacific snake eyed gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Emoia caeruleocauda	Blue tailed gecko		*Endangered and Protected Species Act 2002*, s.3(e)
Emoia concolor	Green tree skink		*Endangered and Protected Species Act 2002*, s.3(e)
Emoia cyanura	Browntail copper striped skink		*Endangered and Protected Species Act 2002*, s.3(e)
Emoia impar	Bluetail copper striped skink		*Endangered and Protected Species Act 2002*, s.3(e)
Emoia parkeri	Fijian copper headed skink		*Endangered and Protected Species Act 2002*, s.3(e)
Emoia trossula	Dandy skink		*Endangered and Protected Species Act 2002*, s.3(e)
Lipinia noctua	Moth skink		*Endangered and Protected Species Act 2002*, s.3(e)
Ramphotoyhplops flaviventer	Flowerpot snake		*Endangered and Protected Species Act 2002*, s.3(e)
AMPHIBIANS			
Platymantis vitiensis	Fiji tree frog		*Endangered and Protected Species Act 2002*, s.3(e)

PART 3 – PROTECTED PLANTS

SCIENTIFIC NAME	COMMON NAME	FIJIAN NAME	LEGISLATION
PLANTS			
Polyalthia angustifolia			*Endangered and Protected Species Act 2002*, s.3(d)
Agathis vitiensis		Dakua / Dakua Makadre	*Endangered and Protected Species Act 2002*, s.3(d)
Kingiodendron platycarpum		Moivi	*Endangered and Protected Species Act 2002*, s.3(d)
Storckiella vitiensis		Vesida	*Endangered and Protected Species Act 2002*, s.3(d)
Garcinia pseudoguttifera		Bulu	*Endangered and Protected Species Act 2002*, s.3(d)
Garcinia myrtiflora		Laubu	*Endangered and Protected Species Act 2002*, s.3(d)
Terminalia vitiensis			*Endangered and Protected Species Act 2002*, s.3(d)
Geissois ternate var 2		Vuga	*Endangered and Protected Species Act 2002*, s.3(d)
Vupaniopsis leptobotrys		Malawaci	*Endangered and Protected Species Act 2002*, s.3(d)
Weinmannia spiraeoides			*Endangered and Protected Species Act 2002*, s.3(d)
Weinmannia vitiensis			*Endangered and Protected Species Act 2002*, s.3(d)
Debeneria vitiensis		Masiratu	*Endangered and Protected Species Act 2002*, s.3(d)
Bischofia javanica		Koka	*Endangered and Protected Species Act 2002*, s.3(d)
Gonystylus punctatus		Mavota	*Endangered and Protected Species Act 2002*, s.3(d)
Endiandra elaeocarpa		Damabi	*Endangered and Protected Species Act 2002*, s.3(d)
Hibiscus storckii			*Endangered and Protected Species Act 2002*, s.3(d)
Medinilla kandavuensis			*Endangered and Protected Species Act 2002*, s.3(d)
Astronidium floribundum			*Endangered and Protected Species Act 2002*, s.3(d)
Astronidium kasiense		Rusila	*Endangered and Protected Species Act 2002*, s.3(d)
Acacia richii		Qumu	*Endangered and Protected Species Act 2002*, s.3(d)
Mimosaceae spec.div		Vavai-loa	*Endangered and Protected Species Act 2002*, s.3(d)
Mimosaceae spec.div		Vavai-vula	*Endangered and Protected Species Act 2002*, s.3(d)
Veitchia vitiensis			*Endangered and Protected Species Act 2002*, s.3(d)
Veitchia filifera			*Endangered and Protected Species Act 2002*, s.3(d)
Acmopyle sahniana		Drautabua	*Endangered and Protected Species Act 2002*, s.3(d)
Dacrycarpus imbricatus		Amunu	*Endangered and Protected Species Act 2002*, s.3(d)
Decusscicarpus vitiensis		Dakua salusalu	*Endangered and Protected Species Act 2002*, s.3(d)
Podocarpus neriifolius		Kuasi	*Endangered and Protected Species Act 2002*, s.3(d)
Dacrydium nidulum		Yaka	*Endangered and Protected Species Act 2002*, s.3(d)
Turrillia ferruginea		Kauceuti	*Endangered and Protected Species Act 2002*, s.3(d)

Turrillia vitiensis		Kauceuti	*Endangered and Protected Species Act 2002*, s.3(d)
Alphitonia zizyphoides		Doi	*Endangered and Protected Species Act 2002*, s.3(d)
Gardenia vitiensis		Ndrega, Meilango	*Endangered and Protected Species Act 2002*, s.3(d)
Mastixiodendron robustum		Duvula	*Endangered and Protected Species Act 2002*, s.3(d)
Gardenia vitiensis		Ndrega meilago	*Endangered and Protected Species Act 2002*, s.3(d)
Santatum yasi		Yasi	*Endangered and Protected Species Act 2002*, s.3(d)
Manikara spec.div		Bausagali-damu	*Endangered and Protected Species Act 2002*, s.3(d)
Manikara spec.div.		Bausagali-vula	*Endangered and Protected Species Act 2002*, s.3(d)
Planchonella garberi		Sarosaro	*Endangered and Protected Species Act 2002*, s.3(d)
Planchonella umbonata		Bauloa	*Endangered and Protected Species Act 2002*, s.3(d)
Sterculia vitiensis		Waciwaci	*Endangered and Protected Species Act 2002*, s.3(d)
Gmelina vitiensis		Rosawa	*Endangered and Protected Species Act 2002*, s.3(d)
Barringtonia asiatica		Vutu	*Endangered and Protected Species Act 2002*, s.3(e)
Boodia brackenridgei			*Endangered and Protected Species Act 2002*, s.3(e)
Cordia subcordata		Nawanawa	*Endangered and Protected Species Act 2002*, s.3(e)
Canarium harveyi var 1		Kaunicina	*Endangered and Protected Species Act 2002*, s.3(e)
Cynometra insularis		Cibicibi	*Endangered and Protected Species Act 2002*, s.3(e)
Intsia bijuga		Vesi	*Endangered and Protected Species Act 2002*, s.3(e)
Gymnostoma vitiensis		Velau	*Endangered and Protected Species Act 2002*, s.3(e)
Parinari insularum		Sa	*Endangered and Protected Species Act 2002*, s.3(e)
Calophyllum inophyllum		Dilo	*Endangered and Protected Species Act 2002*, s.3(e)
Calophyllum vitiensis		Damanu	*Endangered and Protected Species Act 2002*, s.3(e)
Lumnitzera littorea		Sagali	*Endangered and Protected Species Act 2002*, s.3(e)
Terminalia capitanea		Tiviloa	*Endangered and Protected Species Act 2002*, s.3(e)
Terminalia luteola		Mbausomi tivi	*Endangered and Protected Species Act 2002*, s.3(e)
Terminalia psilantha		Mbausomi	*Endangered and Protected Species Act 2002*, s.3(e)
Terminalia pterocarpa		Tivi	*Endangered and Protected Species Act 2002*, s.3(e)
Terminalia simulans			*Endangered and Protected Species Act 2002*, s.3(e)
Terminalia strigillosa.		Tivi losi	*Endangered and Protected Species Act 2002*, s.3(e)
Acsmithia vitiense			*Endangered and Protected Species Act 2002*, s.3(e)
Geissois imthurnii		Vure	*Endangered and Protected Species Act 2002*, s.3(e)
Geissois stipularis		Vure	*Endangered and Protected Species Act 2002*, s.3(e)
Geissois superba		Vure	*Endangered and Protected Species Act 2002*, s.3(e)
Geissois ternate			*Endangered and Protected Species Act 2002*, s.3(e)

Spiraeanthemum graeffei		Katakata, Kutukutu	*Endangered and Protected Species Act 2002*, s.3(e)
Spiraeanthemum serratum			*Endangered and Protected Species Act 2002*, s.3(e)
Weinmannia exigua			*Endangered and Protected Species Act 2002*, s.3(e)
Cyathea micropelidota			*Endangered and Protected Species Act 2002*, s.3(e)
Cyathea plagiostegia			*Endangered and Protected Species Act 2002*, s.3(e)
Cycas seemannii			*Endangered and Protected Species Act 2002*, s.3(e)
Degeneria roseiflora		Karawa yaranggele	*Endangered and Protected Species Act 2002*, s.3(e)
Endospermum robbieanum		Kauvula	*Endangered and Protected Species Act 2002*, s.3(e)
Ischaemum byrone			*Endangered and Protected Species Act 2002*, s.3(e)
Calophyllum amblyphyllum		Ndamanu	*Endangered and Protected Species Act 2002*, s.3(e)
Calophyllum leueocarpum			*Endangered and Protected Species Act 2002*, s.3(e)
Garcinia adinantha		Raumba, mbulumanga	*Endangered and Protected Species Act 2002*, s.3(e)
Geniostoma calcicola			*Endangered and Protected Species Act 2002*, s.3(e)
Geniostoma clavigerum			*Endangered and Protected Species Act 2002*, s.3(e)
Geniostoma stipulare			*Endangered and Protected Species Act 2002*, s.3(e)
Neuburgia macroloba		Vathea	*Endangered and Protected Species Act 2002*, s.3(e)
Astronidium degeneri			*Endangered and Protected Species Act 2002*, s.3(e)
Astronidium inflatum			*Endangered and Protected Species Act 2002*, s.3(e)
Astronidium lepidotum			*Endangered and Protected Species Act 2002*, s.3(e)
Astronidium palladiflorum			*Endangered and Protected Species Act 2002*, s.3(e)
Astronidium saulae			*Endangered and Protected Species Act 2002*, s.3(e)
Astronidium sessile			*Endangered and Protected Species Act 2002*, s.3(e)
Mediniila deeora			*Endangered and Protected Species Act 2002*, s.3(e)
Medinilla kambikambi		Kambikambi	*Endangered and Protected Species Act 2002*, s.3(e)
Medinilla spectabilis			*Endangered and Protected Species Act 2002*, s.3(e)
Medinilia waterhousei		Tangimauthia	*Endangered and Protected Species Act 2002*, s.3(e)
Vavaea amicorunt		Cevua	*Endangered and Protected Species Act 2002*, s.3(e)
Xylocarpus granatum		Dabi	*Endangered and Protected Species Act 2002*, s.3(e)
Samanea saman		Raintree	*Endangered and Protected Species Act 2002*, s.3(e)
Myristica castaneifolia		Kaudamu	*Endangered and Protected Species Act 2002*, s.3(e)
Cleistocalyx decusssatus		Yasimoli	*Endangered and Protected Species Act 2002*, s.3(e)
Cleistocalyx eugenioides		Yasiyasi	*Endangered and Protected Species Act 2002*, s.3(e)
Alsmiltia longipes			*Endangered and Protected Species Act 2002*, s.3(e)
Balaka longirostris			*Endangered and Protected Species Act 2002*, s.3(e)

Balaka macrocarpa			*Endangered and Protected Species Act 2002*, s.3(e)
Balaka microcarpa			*Endangered and Protected Species Act 2002*, s.3(e)
Balaka seemannii			*Endangered and Protected Species Act 2002*, s.3(e)
Calamus vitiensis			*Endangered and Protected Species Act 2002*, s.3(e)
Clincistigma exorrhizum			*Endangered and Protected Species Act 2002*, s.3(e)
Cyplhosperma tangs			*Endangered and Protected Species Act 2002*, s.3(e)
Cyplhosperma trichospatdix			*Endangered and Protected Species Act 2002*, s.3(e)
Gulubia microcarpa			*Endangered and Protected Species Act 2002*, s.3(e)
Neuveitchia storckii			*Endangered and Protected Species Act 2002*, s.3(e)
Physokentia rosea			*Endangered and Protected Species Act 2002*, s.3(e)
Physeikentia thurstunii			*Endangered and Protected Species Act 2002*, s.3(e)
Pritchardia thurstanii			*Endangered and Protected Species Act 2002*, s.3(e)
Veitchia joannis			*Endangered and Protected Species Act 2002*, s.3(e)
Veichia pedionoma			*Endangered and Protected Species Act 2002*, s.3(e)
Veitchia petiolata			*Endangered and Protected Species Act 2002*, s.3(e)
Veitchia simulans			*Endangered and Protected Species Act 2002*, s.3(e)
Dacrydium nausoriense		*Yaka, tangitangi*	*Endangered and Protected Species Act 2002*, s.3(e)
Podocarpus affinis			*Endangered and Protected Species Act 2002*, s.3(e)
Gardenia anapetes		*Tirikiloki*	*Endangered and Protected Species Act 2002*, s.3(e)
Gardenia candida			*Endangered and Protected Species Act 2002*, s.3(e)
Gardenia grievei		*Ndelandrega*	*Endangered and Protected Species Act 2002*, s.3(e)
Gardenia hillii			*Endangered and Protected Species Act 2002*, s.3(e)
Guetcarda speciosa		*Buabua*	*Endangered and Protected Species Act 2002*, s.3(e)
Bruguiera gymnorhiza		*Dogo*	*Endangered and Protected Species Act 2002*, s.3(e)
Pommetia pinnata		*Dawa*	*Endangered and Protected Species Act 2002*, s.3(e)
Palayuium hornei		*Sacau*	*Endangered and Protected Species Act 2002*, s.3(e)
Palayuium purphyreum		*Bauvudi*	*Endangered and Protected Species Act 2002*, s.3(e)
Trichospermum richii		*Mako*	*Endangered and Protected Species Act 2002*, s.3(e)

APPENDIX 2 – NET SIZE LIMITS

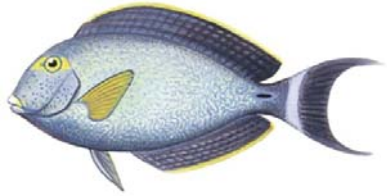
NET TYPE	DEFINITION	NATIONAL
Hand net	'Hand net' means a net fixed on a frame or on two poles, which can be moved in all directions by one person, with a maximum width of 1.5 metres.[105]	No minimum mesh size [106]
Cast net	'Cast net' means a round net with weights around its edges, which is used by being cast over fish in such a way that it sinks to the bottom.[107]	30mm [108]
Whitebait or sardine net	Must only be used for taking whitebait or sardines, and must not be more than 10.5 metres wide or 1.5 metres high. It is prohibited to join two such nets together.	30mm [109]
Wading net	'Wading net' means a net fixed on a frame or on two poles which can be moved in all directions by two persons, with a maximum width 4.3 metres.[110]	50mm [111]
Lawa-ni-busa	'*Lawa-ni-busa*' means a wading net used for taking needlefish (*busa*). The net must only be used for taking *busa* and must not be more than 4.3 metres wide. It is prohibited to join two such nets together.	-
Other nets	Any net that does not fall within the above definitions, including nets that exceed the listed size limits.	50mm [112]

Mesh measurement method: Measure the distance between two diagonally opposite corners of the mesh, when the net is wet and stretched.[113]

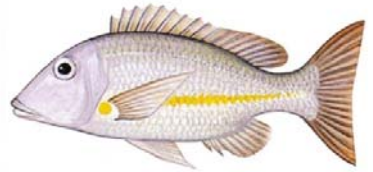
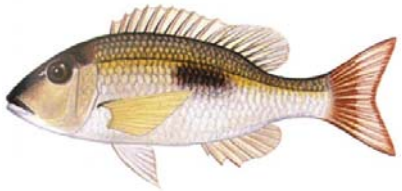
[105] *Fisheries Act,* s.2.
[106] Fisheries Regulations, r.13.
[107] *Fisheries Act,* s.2.
[108] Fisheries Regulations, r.14.
[109] Fisheries Regulations, r.15.
[110] *Fisheries Act,* s.2.
[111] Fisheries Regulations, r.16.
[112] Fisheries Regulations, r.16.
[113] Fisheries Regulations, r.12.

APPENDIX 3 – RECOMMENDED FISH CATCH SIZE LIMITS

To maintain ecosystem health and productivity of fish stocks, the following size limits are recommended.

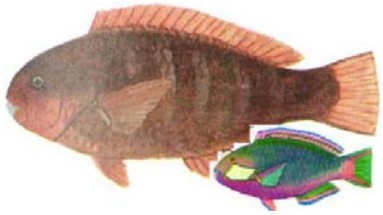
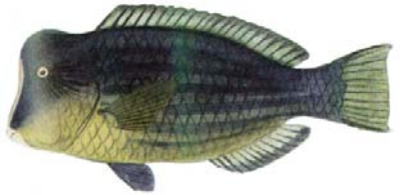
Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Acanthuridae	**Surgeonfish, Tang**	Balagi	**25cm**	2	 *Acanthurus xanthopterus* – Yellowfin Surgeonfish
	except Lined Bristletooth (*Ctenochaetus striatus*)	Dridri	20cm	Modified from 2	 *Ctenochaetus striatus* – Lined Bristletooth
	Unicornfish	Ta	**30cm**	1	 *Naso unicornis* – Bluespine Unicornfish

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Belonidae, Hemiramphidae	**Garfish, Needlefish, Halfbeaks**	Saku Busa	**30cm** **30cm**	1 1	*Tylosurus crocodilus* – Hound Needlefish *Hemiramphus far* – Black-barred Halfbeak *Belone*
Caragidae	**Trevally** *except* Blue Trevally (*Carangoides ferdau*)	Saqa Vilu saqa	**30cm**	1 1	 *Caranx melampygus* – Bluefin Trevally
Carcharhinidae, Sphyrnidae	**Sharks, including Hammerhead Sharks**	Qio	**150cm**	2	
Chanidae	**Milkfish**	Yawa	**30cm**	1	*Chanos chanos*
Haemulidae	**Sweetlips**	Sevaseva	**25cm**	2	 *Plectorhinchus chaetodonoides* – Many-spotted Sweetlips

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Labridae	**Wrasse**		**25cm**	2	*Chelinus chlorourus* – Floral Wrasse *Chelinus oxycephalus* – Snooty Wrasse
	except Tuskfish (*Choerodon* spp.)	Labe	30cm	2	
	except Humphead Wrasse (*Cheilinus undulatus*)	Varivoce	No take	4	
Lethrinidae	**Emperors, Bream**	Sabutu	**25cm**	2	 *Lethrinus obsoletus* – Orange-striped Emperor 
		Kabatia	**25cm**	2	*Lethrinus harak* – Thumbprint Emperor
	except Longface Emperor (*Lethrinus olivaceus*)	Doknivudi	38cm	2	
	except Sweetlip Emperor (*Lethrinus miniatus*)	Belenidawa	38cm	2	
	except Spangled Emperor (*Lethrinus nebulosus*)	Kawago	45cm	2	

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Lutjanidae	**Snapper**	Damu, Kake	**30cm**	1	 *Lutjanus argentimaculatus* – Mangrove Red Snapper  *Lutjanus ehrenbergii* – Blackspot Snapper
	except Yellowtail Blue Snapper (*Paracaesio xanthura*)		38cm	2	
	except Red Snapper (*Lutjanus bohar*)	Bati	No take	2	
	except Humpback Snapper (*Lutjanus gibbus*)	Sabutu damu	No take	2	
	except Chinamanfish (*Symphorus nematophorus*)	Tevulu	No take	2	
	Jobfish	Utouto	**38cm**	2	*Aprion virescens* – Green Jobfish *Aphareus furca* – Smalltooth Jobfish
Gerreidae	**Mojarra**	Matu	**10cm**	1	*Gerres oyena* – Blacktip Silver Biddy

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Leiognathidae	**Ponyfish**	Kaikai	**10cm**	1	 *Leiognathus equulus* – Common Ponyfish *Photopecotralis bindus* – Orangefin Ponyfish *Gazza minuta* – Toothpony
Muglidae	**Mullet**	Kanace	**30cm**	2	
Mullidae	**Goatfish**	Ki	**15cm**	1	 *Upeneus vittatus* – Yellowstriped Goatfish
		Ose	**15cm**	1	*Parupeneus barberinus* – Dash-and-dot Goatfish

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Scaridae	**Parrotfish**	Ulavi	**25cm**	2	 *Chlorurus bleekeri* – Bleeker's Parrotfish  *Chlorurus sordidus* – Bullethead Parrotfish  *Bolbometopon muricatum* – Bumphead Parrotfish
	except Bumphead Parrotfish (*Bolbometopon muricatum*)	Kalia	No take	5	
Scombridae	**Spanish Mackerel**	Walu	**75cm**	2	*Scomberomorus commerson*
	Wahoo	Wau	**75cm**	2	*Acanthocybium solandri*

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
	Indian Mackerel	Salala	**20cm**	1	*Rastrelliger kanagurta*
Serranidae	**Groupers**	Kawakawa	**38cm**	2	 *Plectropomus leopardus* – Leopard Coral Grouper
	except Malabar Grouper (*Epinephelus malabaricus*)	Kasala	38cm	2, 3	
	except Orange Spotted Grouper (*Epinephelus coioides*)	Kasalanitoga	38cm	2, 3	
	except Blacksaddle Coral Grouper (*Plectropomus laevis*)	Batisai	50cm	2	
	except Brown-Marbled Grouper (*Epinephelus fuscoguttatus*)	Delabulewa	50cm	2	
	except Camouflage Grouper (*Epinephelus polyphekadion*)	Kawakawa	50cm	2	
	except Giant Grouper (*Epinephelus lanceolatus*)	Kavu	No take	4	

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
Siganidae	**Rabbitfish**	Nuqa	**20cm**	1	
	except Foxface Rabbitfish (*Siganus uspi*)		No take	4	*Siganus uspi* – Foxface Rabbitfish
Sphyraenidae	**Barracuda**	Ogo	**30cm**	2	 *Sphyraena barracuda* – Great Barracuda
		Silasila	**30cm**	2	 *Sphyraena forsteni* – Bigeye Barracuda
Portunidae	**Swimming Crab** (*Scylla serrata*)	Qari dina	**14cm**	3	
Trochidae	**Trochus Shell** (*Trochus niloticus*)	Sici	**9cm (max. 12cm)**	3	

Family	Common Name(s)	Fijian Name	Minimum	Source	Example(s)
	Beche-de-mer	Sucuwalu, Dri	**20cm**	3	
	except Black Teatfish (*Holothuria whitmaei*)		30cm	3	
	except White Teatfish (*Holothuria fuscogilva*)		35cm	3	
	except Golden Sandfish (*Holothuria scabra var versicolor*)		30cm	3	
	except Blackfish (*Actinopyga miliaris*)		25cm	3	
	except Surf Redfish (*Actinopyga mauritiana*)		25cm	3	
	except Curryfish (*Stichopus hermanni*)		35cm	3	
	except Redfish (*Thelenota ananas*)		45cm	3	
Pteriidae	**Pearl Oyster Shell** *(Pinctada margaritifera)*	Civa	**10cm**	1	

Family	Common Name	Fijian Name	Minimum	Maximum	Source
Lutjanidae	**Snapper** *except* Smalltooth Jobfish (*Aphareus furca*) *except* Green Jobfish (*Aprion virescens*) *except* Yellowtail Blue Snapper (*Paracaesio xanthura*) *except* Red Snapper (*Lutjanus bohar*) *except* Humpback Snapper (*Lutjanus gibbus*) *except* Chinamanfish (*Symphorus nematophorus*)	Damu	**30cm** 38cm 38cm 38cm No take No take No take		1 2 2 2 2 2 2
	Jobfish		**38cm**		2
Muglidae	**Mullet**	Kanace	**30cm**		2
Scaridae	**Parrotfish**	Ulavi	**25cm**		2
Scombridae	**Spanish Mackerel**	Walu	75cm		2
	Wahoo		75cm		2
Serranidae	**Groupers** *except* Malabar Grouper (*Epinephelus malabaricus*) *except* Orange Spotted Grouper (*Epinephelus coioides*) *except* Blacksaddle Coral Grouper (*Plectropomus laevis*) *except* Brown-Marbled Grouper (*Epinephelus fuscoguttatus*) *except* Camouflage Grouper (*Epinephelus polyphekadion*) *except* Giant Grouper (*Epinephelus lanceolatus*)	Kawakawa	38cm 38cm 38cm 50cm 50cm 50cm No take	- 100cm 100cm 80cm 70cm 70cm -	2 2, 3 2, 3 2 2 2 2

Family	Common Name	Fijian Name	Minimum	Maximum	Source
Sphyraenidae	**Barracuda**	Ogo	30cm		2
Sphyrnidae	**Hammerheads**		150cm	-	2
	Swimming Crab (*Scylla serrata*)	Qari dina	14cm	-	3
	Trocas Shell (*Trochus niloticus*)	Sici	9cm	12cm	3
	Beche-de-mer *except* Black Teatfish (*Holothuria whitmae*) *except* White Teatfish (*Holothuria fuscogilva*) *except* Golden Sandfish (*Holothuria scabra var versicolor*) *except* Blackfish (*Actinopyga miliaris*) *except* Surf Redfish (*Actinopyga mauritiana*) *except* Curryfish (*Stichopus hermanni*) *except* Redfish (*Thelenota ananas*)	Sucuwalu, Dri	20cm 30cm 35cm 30cm 25cm 25cm 35cm 45cm	-	3 3 3 3 3 3 3 3
	Pearl Oyster Shell *(Pinctade margaratifera)*	Civa	10cm	-	1

Sources:

1. *Fisheries Act, Fisheries Regulations.*
2. *Fish Size and Bag Limits for Queensland*, Department of Primary Industries and Fisheries, Queensland, Australia (March 2009).
3. *Environmental Code*, South Province, New Caledonia (2009).

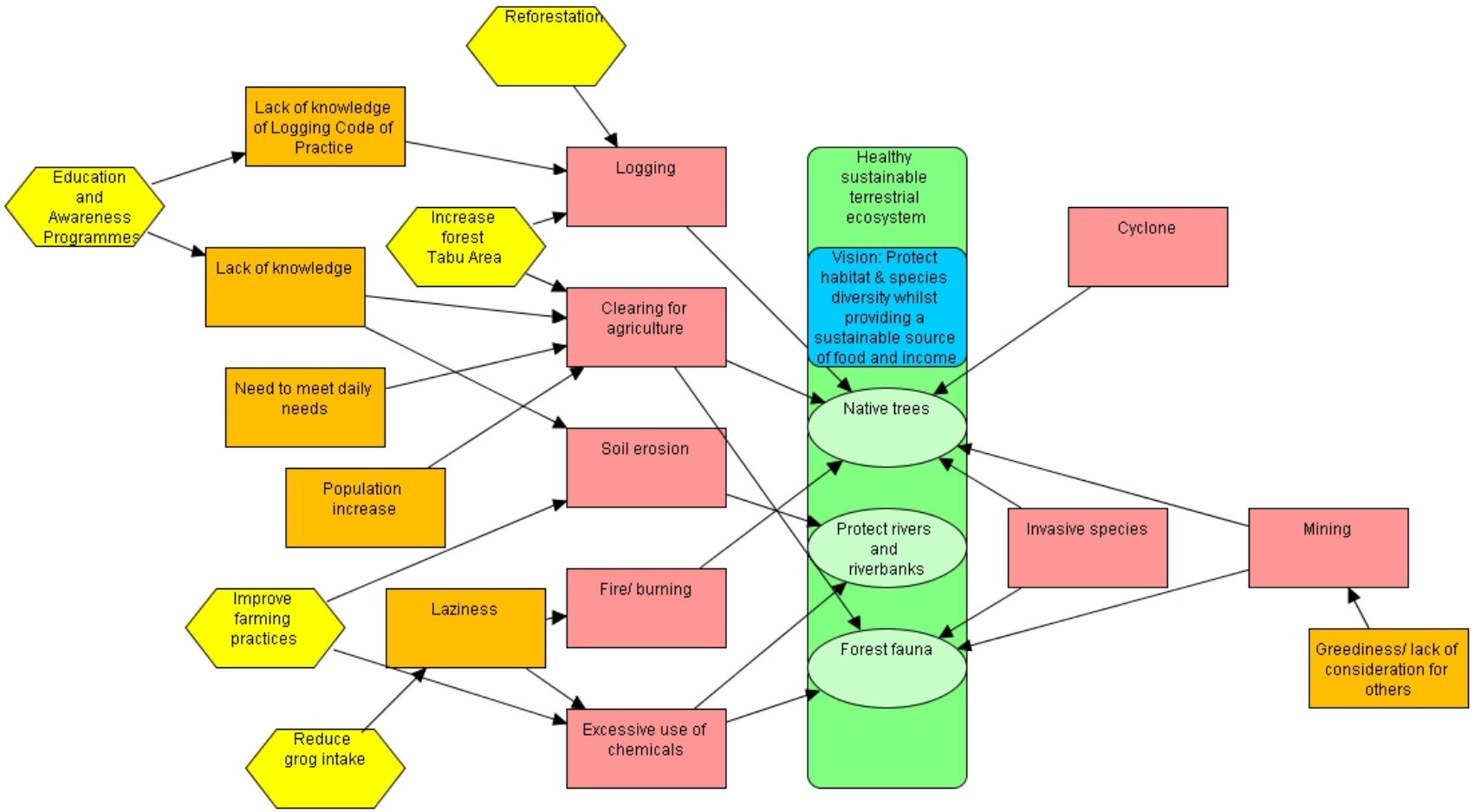
It is an offence under the *Fisheries Regulations* to kill, take, sell or display for sale any of the following species if they are less than the minimum length listed below.[114]

Fijian Name	Common Name	Genus	Minimum Length
Ogo	Barracuda	*Sphyrona*	300 mm
Saqa (excluding vilu saqa)	Crevally, Trevally, Pompano	*Caranx*	300 mm
Kanace	Grey Mullet	*Mugil*	200 mm
Ika Droka	Glassperch, Aholehole	*Dules*	150 mm
Nuqa	Ketang, Spinefoot Rabbitfish	*Siganus*	200 mm
Salala	Long-jawed Mackerel	*Rastrelliger*	200 mm
Saku Busa	Longtom, Garfish, Greengar	*Belone*	300 mm
Yawa	Milk Fish	*Chaos*	300 mm
Matu	Mojarra	*Gerres*	100 mm
Ulavi	Parrotfish	*Scarichthys*	250 mm
Kaikai	Pouter, Slimy, Soapy, Peperek	*Gazza*	100 mm
Donu, Kawakawa, Kavu	Rock Cod, Grouper, Salmon Cod	*Serranus*	250 mm
Kawago, Dokonivudi, Musubi	Sea Bream, Pig-faced Bream	*Lethrinus*	250 mm
Kabatia, Kake	Small Sea Bream	*Lethrinus*	150 mm
Sabutu	Small Sea Bream	*Lethrinus*	200 mm
Balagi	Surgeon Fish	*Hepatus*	200 mm
Ki, Ose	Surmullet, Goatfish, Whiskercod	*Mulloidichthys, Pseudopeneus, Upeneus*	150 mm
Damu	Snapper	*Lutjanus*	300 mm
Ta	Unicorn-Fish, Leather jacket	*Naso*	300 mm
Qari dina	Swimming Crab	*Scylla serrata*	125 mm
Sici	Trocas shell	*Trochus niloticus*	90 mm
Civa	Pearl Oyster Shell	*Pinctade margaratifera*	100 mm
Sucuwalu, Dri	Beche-de-mer	*Holothuria scabra*	76 mm

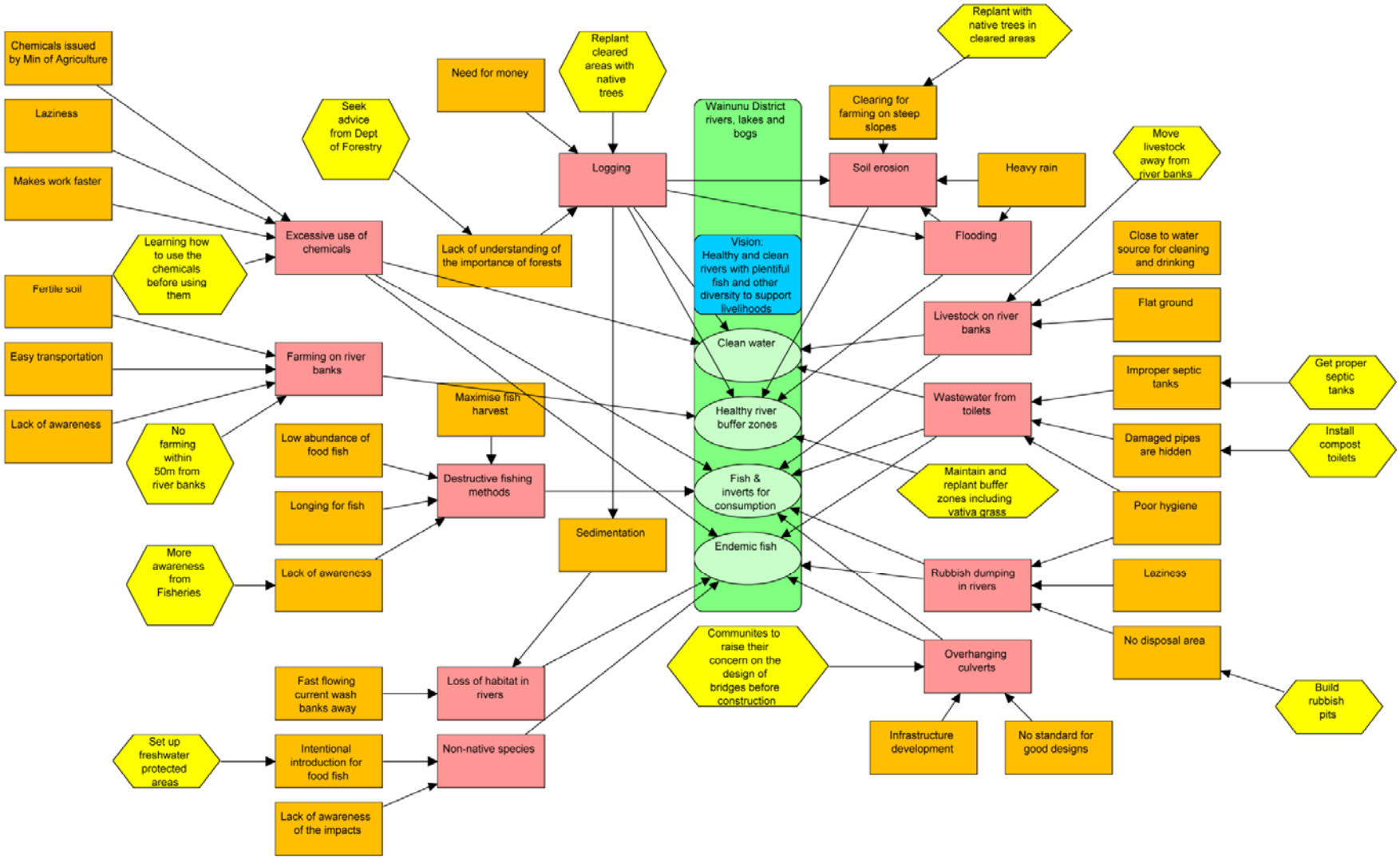
Measurement method: (1) Fish: measure from the point of the snout to the middle of the tailfin when the fish is laid flat. (2) Trochus: measure across the whorl. (3) Pearl Oyster Shell: measure from the butt or hinge to the opposite lip

[114] *Fisheries Regulations,* rr.18, 19, 21, 25B.

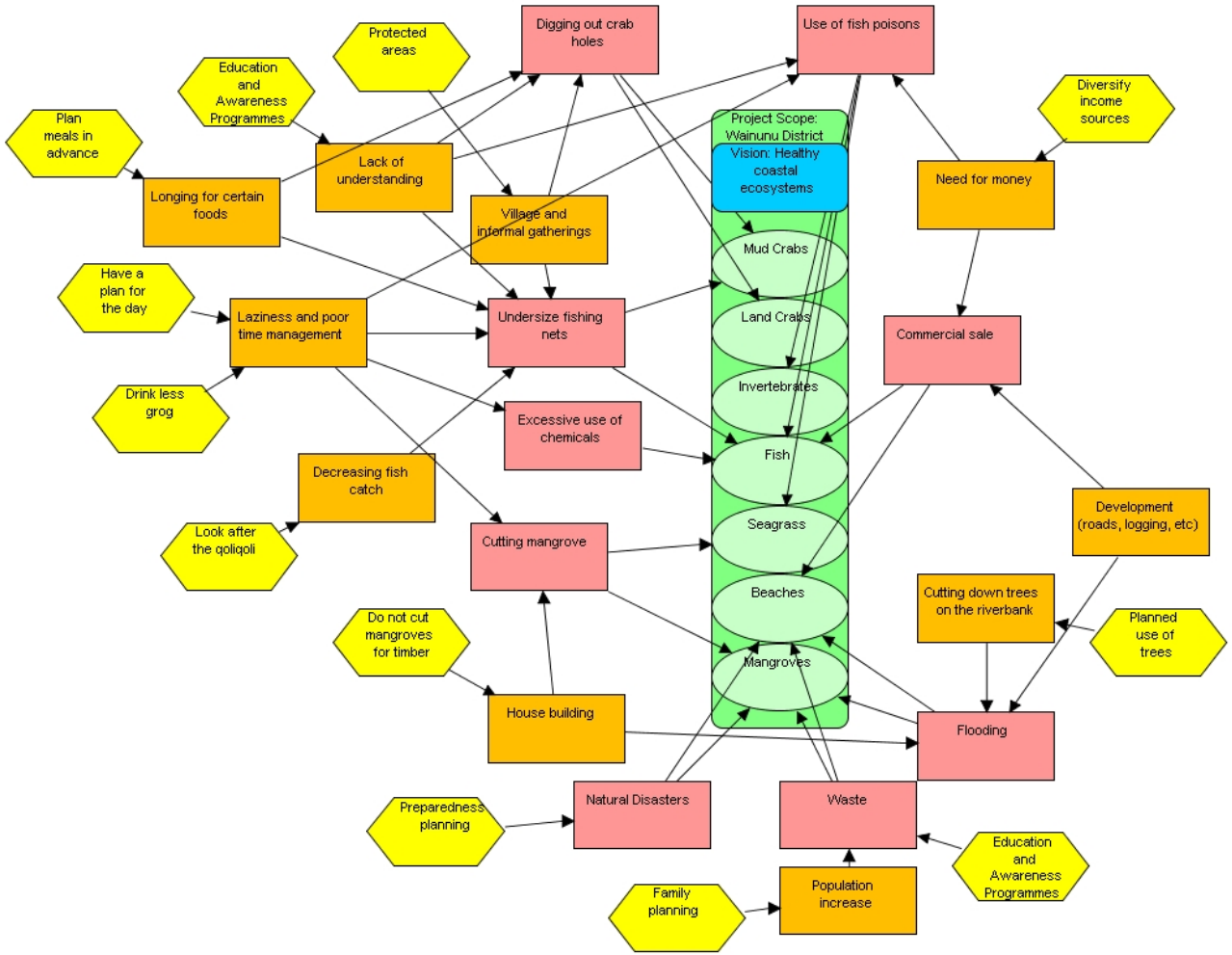
APPENDIX 4 – TERRESTRIAL THREAT DIAGRAM



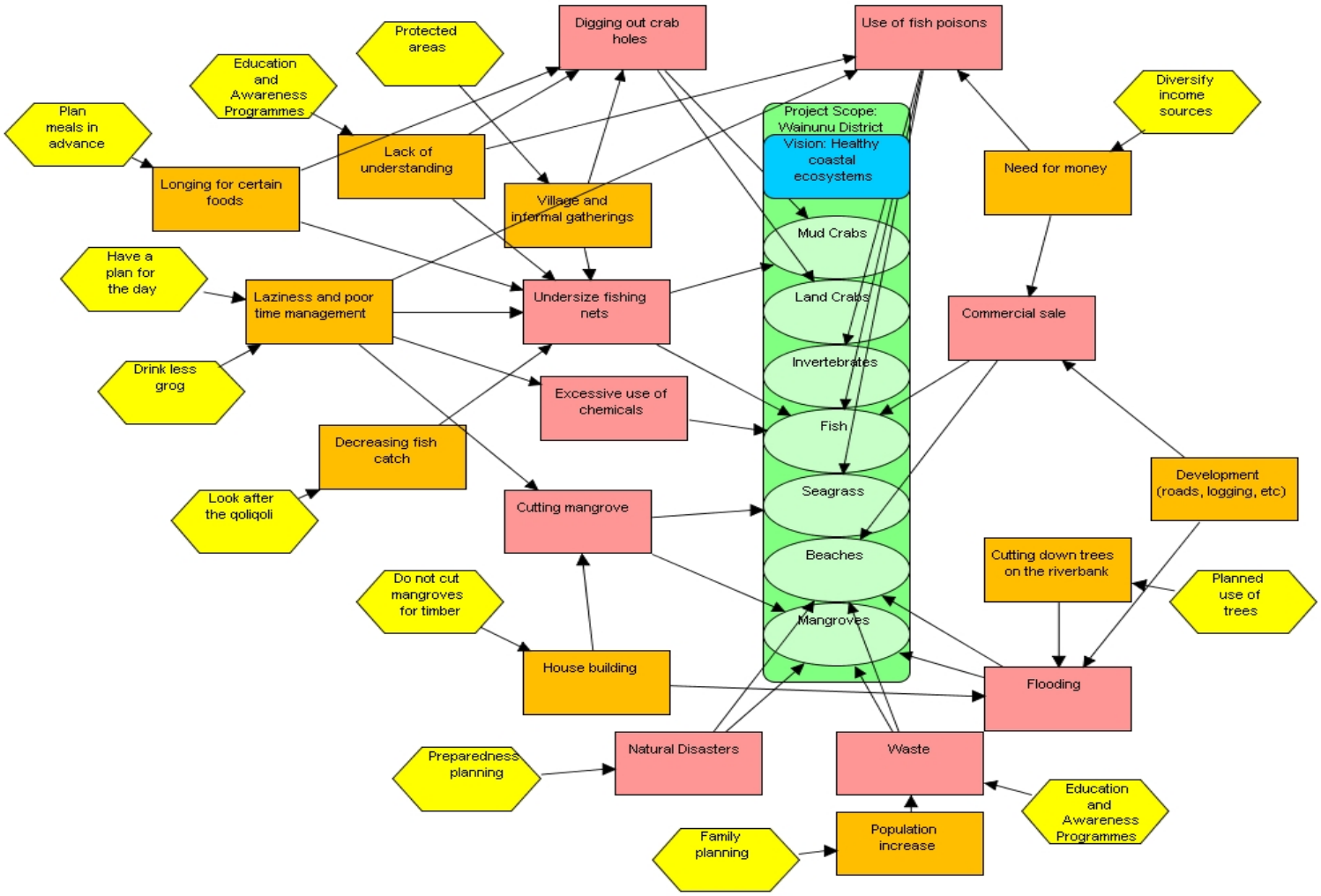
APPENDIX 5 – FRESHWATER THREAT DIAGRAM



APPENDIX 6– COASTAL AND ESTUARINE THREAT DIAGRAM



APPENDIX 7 – MARINE THREAT DIAGRAM



APPENDIX 8 – LEGAL MECHANISMS FOR ESTABLISHING PROTECTED AREAS

1.0. LEGAL PROCESS FOR ESTABLISHING MARINE PROTECTED AREAS

There are two mechanisms available for legally protecting marine areas under the *Fisheries Act*:

1. restricted areas
2. fishing licence conditions.

The key features of these mechanisms, and the process for using them, are described below.

1.1. Restricted Areas

Key Features

The Minister for Fisheries can declare 'restricted areas', commonly known as marine reserves. Fishing in a restricted area without a permit is an offence. The penalty for fishing in a restricted area with a permit is $500 and/or three months imprisonment.

Process

The Minister may create a restricted area by either (a) creating regulations specifically for the new restricted area; or (b) amending the existing list of restricted areas in the *Fisheries Regulations*.

In either case, the Minister must take the proposed regulations (or amendment) to Cabinet for approval. The members of Cabinet are the Prime Minister and Ministers. Cabinet meets regularly to make decisions on matters of national policy. If Cabinet approves the regulations (or amendment) the Minister will then publish the regulations in the Government Gazette.

Before the Cabinet meeting, an officer of the Department of Fisheries will prepare a written submission to be presented to Cabinet by the Minister. The Cabinet submission will include a brief description of the proposal, background, discussion and recommendations.

If resource owners want the Minister for Fisheries to declare a restricted area in their *qoliqoli*, the *turaga ni yavusa* should discuss the proposal with the Fisheries Department, and then submit a written proposal to the Minister, highlighting the conservation significance of the area, and providing evidence that establishment of the restricted area is supported by the *vanua*.

Only the Minister for Fisheries may remove or modify a restricted area. To remove or modify a restricted area, the Minister must revoke or amend the relevant regulations, following the same process for creating a restricted area.

1.2. Fishing Licence Conditions

Key Features

Any person who wants to fish for 'trade or business' must apply for a fishing licence (unless they are only fishing with a line from the shore or with a spear).

Fishing licences can include legally binding conditions. Licence conditions can be used to prohibit fishing in particular areas, including *tabu* areas.

Breaching licence conditions is an offence. The penalty for breaching a licence condition is $500 and/or three months imprisonment.

Process

Fishing licences are issued by Fisheries Department licensing officers. Before issuing a fishing licence, the Fisheries Department will request a letter of consent from the *turaga ni yavusa*.

The *turaga ni yavusa* can use the letter of consent to ensure that *tabu* areas are included in the licence conditions. It is important to clearly define the rules of the *tabu* area(s) in the letter of consent, and attach a map that clearly and accurately illustrates the *tabu* boundaries.

Licences expire on 31 December each year. This means that a new letter of consent will be required each year, and provides an opportunity to modify the rules or boundaries of the *tabu* area(s).

2.0. LEGAL PROCESS FOR ESTABLISHING TERRESTRIAL PROTECTED AREAS

There are a number of mechanisms available for legally protecting terrestrial areas, including:

1. nature reserves
2. protected catchment areas
3. conservation leases.

The key features of these mechanisms, and the process for using them, are described below.

2.1. Nature Reserves

Key Features

The Minister for Forests may declare nature reserves. It is an offence to log, clear, burn, build, plant, graze, hunt or fish in a nature reserve (maximum penalty: $10,000 fine or 2 years imprisonment).

Logging licences must not be issued in a declared nature reserve. Mining leases must not be issued in a declared nature reserve without the approval of the Conservator for Forests.

Process

The Minister for Forests may only declare a nature reserve on the recommendation of the Forestry Board. The Forestry Board is an advisory board, chaired by the Conservator for Forests. In the case of *iTaukei* land, the Minister must also obtain the consent of landowners and the iTaukei Land Trust Board (TLTB) before establishing a nature reserve.

If landowners want the Minister to declare a nature reserve on their land, the *turaga ni mataqali* should discuss the proposal with the NLTB and the Forest Department, and then prepare a written proposal to the Conservator for Forests, highlighting the conservation significance of the area, and providing evidence of support from NLTB and the *mataqali*.

Only the Minister for Forests may remove or modify a nature reserve. The Minister may only remove or modify a nature reserve on the recommendation of the Forestry Board.

2.2. Protected Catchment Areas

Key Features

The Minister for Water may declare any area of land or water to be a water supply catchment area. It is an offence to commit any act which causes pollution of water within a declared catchment area (maximum penalty: $100).

Logging licences must not be issued in a declared catchment area. Mining leases must not be issued in a declared catchment area without the approval of the Commissioner for Water Supply.

Process

The Minister must publish notice of his/her intention to declare a protected catchment area in the Gazette. The notice must describe the proposed catchment area, and allow at least two months for any owner, lessee or licensee of the area to object in writing to the proposed declaration. The Minister must consider any such objections before making a decision about declaration of the area.

If landowners want the Minister to declare a water supply catchment area on their land, the *turaga ni mataqali* should discuss the proposal with NLTB and the Department of Water, and then prepare a written proposal to the Minister, highlighting the conservation significance of the area, and providing evidence of support from NLTB and the *mataqali*.

Only the Minister for Water may remove a declared catchment area.

2.3. Conservation Leases

Key Features

The iTaukei Land Trust Board (TLTB) may issue leases over *iTaukei* land. Since development leases (for example, for logging or tourism development) cannot be issued over land that is already leased, leases can be used for conservation purposes if there is a lessee who is willing to pay to conserve a particular area (for example, Moody's Resort on Namenalala Island).

Process

The terms and conditions of *iTaukei* land leases are negotiated by TLTB on behalf of landowners. The consent of more than 50% of the relevant *mataqali* is required before TLTB will issue a lease. Lease payments are negotiated by NLTB based on standard payment criteria.

If landowners have identified a lessee who is willing to enter into a conservation lease over part of their land, the *turaga ni mataqali* and the lessee should discuss the proposal with TLTB, highlighting the conservation significance of the area, and providing evidence of support from the *mataqali.*

If the lessee fails to make lease payments, or breaches the conditions of the lease, TLTB may terminate the lease.

APPENDIX 9 – USEFUL CONTACTS

WAINUNU RESOURCE MANAGEMENT COMMITTEE

WRMC Chairman, Mosese Ratagau
Ph. 9351583
Vice Chairman, Nemani Dreunikarawa
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GOVERNMENT AGENCIES

iTaukei Lands Trust Board
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iTaukei Lands and Fisheries Commission
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Bua Provincial Office
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Fisheries Officer Bua, Alifereti Ului Tuinamata
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Department of Fisheries
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Divisional Fisheries Officer Northern
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Department of Forestry
Conservator of Forest, Mr Inoke Wainiqolo
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Forestry Officer Bua (Dreketi)
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Department of Environment
Director Environment, Mr Jope Davetanivalu
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Ministry of Agriculture
Land Use Section, Department of Land Resource and Planning, Mr Atish Prasad
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Principal Agriculture Officer Northern, Mr John Cox
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Department of Tourism
Principal Tourism Officer, Mr Donald Mitchell
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National Trust of Fiji
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SPC-GTZ
Land Use Planning and Facilitation Specialist
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NON-GOVERNMENT ORGANISATIONS

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Program Director, Dr Stacy Jupiter
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Coral Reef Alliance (CORAL)
Fiji Field Manager, Mr Sunil Raj Prasad
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Partners in Community Development Fiji
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