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Setting Priorities for Marine Conservation in the Fiji Islands Marine Ecoregion

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Fiji Islands Marine Ecoregion Opening Speech

Invited guests, Participants, Government officers, NGO representatives, and community representatives. It gives me great honor to welcome you to this very important workshop to craft develop a biodiversity vision for that will ensure the conservation and sustainable development for Fiji's marine environment.

I would like to take this opportunity to extend my appreciation to the organizers World Wide Fund for Nature of the workshop, which I know will benefit the conservation of our marine resources and the environment.

The Fiji Islands Marine Ecoregion which includes our coastal, Inshore and offshore marine environment is rich in marine biodiversity and endemism. A natural and vibrant ecological mosaic, it links coastal forests and mangroves; tidal estuaries, seagrass beds and lagoons; rich coral reefs and barrier islands. Amongst this rich mosaic can be found over a third of the worlds coral species, the 3rd longest barrier reef in the world, and a large number of species of mangroves and tropical sea grass species.

However, the immense natural value of this region does not end with the counting of its many unique habitats. Living, migrating and multiplying within this rich natural environment are over a third of the coral reef fish species of the Indo-Pacific, many species of whales, and 5 of the seven species of marine turtles.

There is no question that the natural wealth and diversity of this region makes it a unique place in the world – a place that should be protected and nurtured for many generations to come. Our marine environment sustains an incredible diversity of natural and our people. To sustain the integrity and health of those systems for our children's future, and beyond them the many generations that will follow, a collective biodiversity vision is needed to be shaped for the Fiji Islands Marine Ecoregion.

The daily lives, traditions, language and knowledge of close to 90% of the people of Fiji who live along the our coast have always intricately linked to their marine environment. The lifestyles and livelihood traditions of our people are a critical feature of Fiji's 'seascape'. They are unique and valuable to future generations as the habitats and species that mark this ecoregion as an outstanding feature on the world map.

In conceiving a vision for the future of Fiji's marine environment, the instincts and insights, needs and desires of the people and communities of the Ecoregion valued alongside those of nature. Accepting the cultural, social and political diversity of Fiji will be critical to the relevance and sustainability of any vision that is conceived for it. In promoting the conservation and management of natural resources within Fiji, all the stakeholders need to be committed to supporting the natural and human mosaic which is the Fiji Islands Marine Ecoregion.

The unique natural characteristics and vibrant cultural heritage of the Fiji Islands Marine Ecoregion are today coming under increasing pressure from a variety of forces. Climate change, cyclones and tidal waves can have a devastating impact on the state of the regions biodiversity and the people who depend on it. Rapid population growth, expanding commercial interests and decision making constrained by incomplete information, are individually and collectively, also contributing to the diminished health and sustainability of the region. Already it is clear that:

- Inshore fisheries are under pressure from commercial and subsistence use
- Reefs are being irrevocable damaged by destructive fishing practices
- Illegal, unregulated and unreported fishing is diminishing stocks
- Fiji waters are being polluted by ballast water discharges, oil and toxic spills
- Poorly planned coastal developments and infrastructure are degrading the coast and inland waters

Dear participants, in moving forward with the ambitious conservation vision for the Fiji Islands Marine Ecoregion – one that goes hand in hand with a vision for human development and security – it will be critical for the government, experts, and of course communities of the Fiji Islands Marine Ecoregion to recognize and address the pressures that are driving current patterns of behavior and exploitation. Ultimately it will be the quality of information and scientific data that we generate and share, the strength and transparency of the partnerships we form, the level and sustainability of funding that we secure, and the equity of rights and opportunities across the region that will shape the course of future action.

A vision and plan of action for the conservation of the Fiji Islands Marine Ecoregion must begin with a comprehensive understanding of Fiji's unique habitats, species and ecological processes. The vision will provide us all with the opportunity to understand fundamental profile, characteristics and values of the Fiji Islands Marine Ecoregion. Only with that understanding of natural systems and processes the containment and mitigation of the pressures that is faced be developed in a collaborative and realistic manner.

In pursuing an ambitious vision for Fiji – across multiple countries, sectors and culturally diverse communities – we must be sophisticated in our response to the interaction of social, economic and ecological factors that shape the threats and opportunities for conservation. This will require marine conservationists like yourselves to engage with many disciplines and approaches in the planning implementation of conservation programmes. These include:

- The integration of scientific research, socio-economic analysis and traditional knowledge
- Institutional development and capacity building
- Policy development
- Information sharing, communication and learning

The government this year passed the National Biodiversity Strategy Action Plan, which this Ecoregion Vision will build on. This biological vision map and database will also greatly assist government in developing the 410 qoliqoli management plans in collaboration with existing local initiatives like the Fiji Locally Managed Marine Areas – Network.

As you engage in discussion, priority setting and analysis over the next 3 days I encourage you to think of the future that you want for your children's children. That future, inevitably bound to the state of the marine environment, will depend in part on the journey that you help us begin here in Suva today. Your contribution, as scientific and national experts in Fiji, will be critical to the direction and quality of our share journey. On behalf of the people of Fiji, I thank you in anticipation for the expertise and ambition that you are bringing to the shaping of our future.

I am honored to now declare the Fiji Islands Marine Ecoregion Vision Workshop – 'Expanding the horizon for marine conservation' officially opened and wish the participants fruitful deliberations

Honorable Minister for Fisheries (2003)
Government of Fiji
MR. Konisi Yabaki

Acronyms and Abbreviations

BPOA	Biodiversity Plan of Action
CBD	Convention on Biodiversity
CITES	Convention on International Trade in Endangered Species
EAP	Ecoregional Action Plan
EIA	Environmental Impact Assesment
EMA	Environment Management Act
ERC	Ecoregion Conservation
FBSAP	Fiji Biodiversity Strategy and Action Plan
FFA	Forum Fisheries Agency
FIME	Fiji Islands Marine Ecoregion
FLMMA	Fiji Locally Managed Marine Area Network
GDP	Gross Domestic Product
GSR	Great Sea Reef
IUCN	International Union for the Conservation of Nature
LMMA	Locally Managed Marine Area
MDG	Millenium Development Goal
MPA	Marine Protected Area
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non Government Organization
NTSP	National Tourism Strategic Plan
PCA	Priority Conservation Area
PIROF	Pacific Islands Regional Ocean Forum
PIROP	Pacific Islands Region Oceans Policy
SDP	Strategic Development Plan
SOPAC	South Pacific Applied Geoscience Commision
SPC	Secretariat for the Pacific Community
SPREP	South Pacific Regional Environmental Programme
SPRFP	South Pacific Region and Related Protocols
UNDP	United Nations Development Programme
USP	University of the South Pacific
WCS	Wildlife Conservation Society
WI	Wetlands International
WSST	World Summit on Sustainable Development
WWF SPP	World Wide Fund for Nature South Pacific Programme
WWF	World Wide Fund for Nature

Executive Summary

In December 2003, over 80 local and overseas stakeholders with knowledge and experience of the Fiji Islands Marine Ecoregion[1] (FIME) were convened by WWF to discuss the importance of and gather information on the biodiversity and associated threats to Fiji's marine environment.

This report provides an overview of the outcomes of this valuable process and describes the criteria used to enable participants to agree on key areas of biodiversity. The report reflects information generated by groups of scientists, government and non-government organization representatives, community members and marine enthusiasts who have a range of expertise. Both scientific and anecdotal knowledge were obtained for selected areas, and the gaps in the current knowledge were identified. Areas were identified as important according to their unique biological, geological or cultural attributes. Community representatives were particularly key in identifying areas of cultural significance.

Thirty-five Priority Conservation Areas (PCAs) were identified and agreed by stakeholders. Five areas were ranked to be globally important (see Table 1) due to their uniqueness, endemism and high levels of diversity. Fifteen areas were considered to be of national importance and 15 of sub-regional importance. These 35 areas capture the full range of marine biodiversity that makes FIME unique and that if conserved will contribute to the maintenance of integrity of Fiji's marine systems.

Table 1 : The five gobal priority areas identified by Fiji stakeholders

- **Cakaulevu or the Great Sea Reef, Macuata Province, Vanua Levu.** The third longest barrier reef in the world, with an exceptional level of endemism and intact systems of lagoons, channels, mangroves and seagrass habitats.
- **Lomaiviti Triangle (Vatuira Channel-Ovalau-Makogai-Wakaya Channel).** A deep water channel very unique in the South Pacific, supporting intact and diverse species and habitats. It is also a known migratory route for whales with the island of Gau known to be an important breeding area for Humpback whales.
- **Namenalala.** A Marine Protected Area located at a barrier reef system to the south of Vanua Levu. It is a known migratory route for open ocean species, such as whales, turtles and dolphins and is a significant turtle nesting site. Namenalala is thought to be the last remaining nesting area in Fiji for Hawksbill turtles.
- **Southern Lau Group.** A region of isolated limestone and oceanic atoll islands with a range of habitats including seagrass, oceanic patch reefs and extensive barrier reef systems. The isolated oceanic conditions provide a distinct range of habitats and species composition and provide important breeding and nesting areas for green and Hawksbill turtles and the endemic clam (Tridacna tevoroa).
- **Rotuma.** An isolated volcanic island northwest of the main Fiji group. Isolated geographical and oceanic conditions create a distinct range of habitats and species, with high endemism and uniqueness. The blue coral Heliopora is limited in its distribution in Fiji's waters area and is concentrated in Rotuma.

[1] Ecoregion conservation is a process that supports conservation planning and action at a scale that is determined by patterns of biological diversity and ecological processes which sustain them. It focuses on maintaining the natural patterns and processes within an area of high biodiversity, irrespective of country and state boundaries.

Executive Summary

In addition to identifying key areas of biodiversity importance, a number of conclusions and recommendations were drawn by the participants :

- Fiji's marine environment contains globally and regionally significant biodiversity that needs to be protected for its intrinsic value and the central role it plays in sustaining the livelihoods of the people of Fiji.
- The pressures being placed on the marine environment and its biodiversity today far exceed current conservation efforts. The alleviation of poverty and enhancement of community capacity to pursue sustainable livelihood needs should be tackled in partnership with conservation efforts.
- There are a number of promising initiatives and programmemes being conducted at the national, regional and international level, but a concerted effort is required to link these efforts and ensure that there is coherence between policies and action.
- Current knowledge of Fiji's marine ecosystems and biodiversity is poor. It is essential to consolidate and expand this knowledge if conservation and sustainable resource management of the marine environment is to be effective. Information gaps need to be filled and opportunities for collaboration identified to ensure that conservation efforts and considerations for further research and monitoring are an integral part of future marine conservation and resource management planning.

Taking an ecoregional approach to conservation and sustainable marine resource management aims to add value and definition to existing conservation frameworks. There have already been a number of efforts nationally to conserve and manage Fiji's marine biodiversity. The National Biodiversity Strategy and Action Plan (NBSAP), developed in 1999, adopted by Act of Parliament in March 2005, highlighted the need for more information on the biological and ecological significance of Fiji's biodiversity. The findings in this report provide an important step towards obtaining such baseline information. The report should, therefore, be viewed as an information tool that is consistently updated and reviewed following further scientific survey and assessment.

The workshop outputs provide initial contributions to establishing a more integrated approach to the conservation of biodiversity in the Fiji Islands Marine Ecoregion. Adopting such an approach will require building political will and inspiring key stakeholders to support conservation efforts. In particular, a concerted effort is required to link existing conservation and sustainable resource management efforts and commitments and to ensure coherence of policy, action and governance. Moving ahead requires appropriate scientific information, capacity building, policy engagements and sustainable development of the tourism and fisheries sectors in support of conservation and management of FIME biodiversity.

WWF and its partners will continue to support local conservation efforts in the Fiji Islands Marine Ecoregion and at the same time begin to work to address some of the recommendations made during this workshop.

1.0 Introduction

WWF is facilitating an ecoregional approach towards tackling the conservation and sustainable management of Fiji's marine environment. Ecoregion conservation is a process that supports conservation planning and action at an ecological region-wide scale. The overarching goal is to conserve and restore the fullest possible range of biodiversity over large spatial and temporal scales. It provides a mechanism for key stakeholders and sectors to place biodiversity conservation in the context of social and economic needs and opportunities, respecting the need to protect outstanding natural features and preserve local lifestyles and livelihoods. Understanding the biological importance of an area or the rarity of a biological unit provides a basis for establishing priorities and helps us to determine the urgency of action needed.

There are several general principles to undertaking ecoregional conservation. In particular, the ecoregional process should :

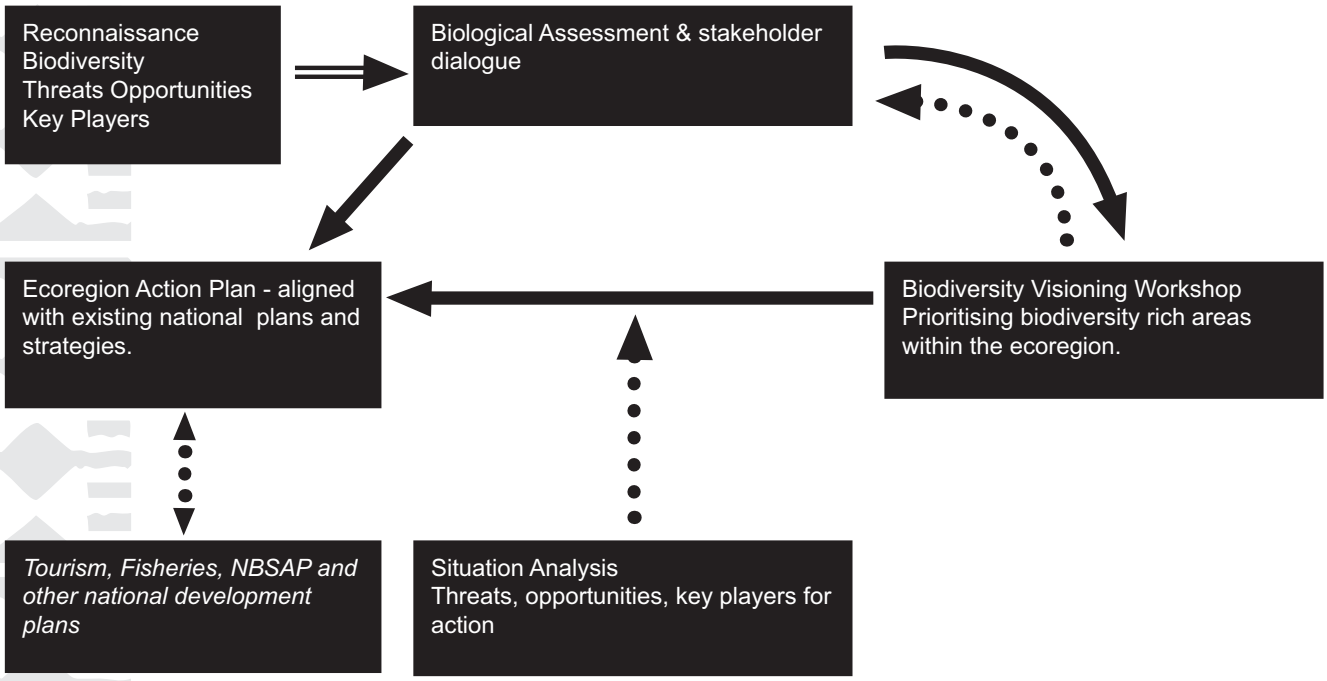
i) be driven by a common vision and raise a collective voice for conservation and sustainable resource management;
ii) implement programmes at spatial and temporal scales compatible with ecological processes;
iii) use networks of protected areas within managed landscapes or seascapes as the core component of conservation planning;
iv) address the broader social, economic and policy factors critical to achieving sustainability;
v) build collaborative arrangements for conservation and ensure stakeholder participation;
vi) build capacity to support development and conservation efforts; and
vii) link policy to implementation on the ground.

To be successful over the long term, ecoregion conservation must involve all the people who affect and who are affected by biodiversity. These stakeholders can range from local communities to national governments and international businesses. Effective ecoregional conservation also requires the formation of key partnerships. Sectors and institutions that may not be traditional partners need to work together to achieve a common goal.

Ecoregion conservation is an iterative process that is designed to be flexible, enabling the incorporation of new information, new policies and new stakeholders. The ecoregion process involves several key steps towards the development of a conservation and sustainable resource management action plan, as illustrated in Figure 1[2] .

[2] The two-way arrows indicate opportunities that provides new information into the process, refining the sets of outputs.

Figure 1 The Ecoregion Conservation Process.



A reconnaissance phase – provides a quick, multidisciplinary assessment that provides important baseline information to inform decisions and enable prioritization during biodiversity visioning. This is done through literature review for scientific information and discussions with scientists and people involved with management of the marine environment. It may involve the review of the distribution of species, communities and the ecological dynamics. Additional information collected at this stage should include a review of general conservation threats and opportunities, the status of conservation initiatives and needs, and the potential role of different stakeholders and partners. An initial reconnaissance phase for Fiji was carried out in 2003 and determined the current political, legislative, environmental, social and economic features. Ecoregional base maps showing basic information such as bathymetry, sea mounts, trenches, currents, wind direction, coral reefs, sea grass beds, estuaries, mangroves etc. on which to produce the biodiversity vision is created as part of the reconnaissance.

A Biodiversity Vision - articulates the 50-year conservation goal for an ecoregion. The vision guides the development of an ecoregional conservation plan, as well as the decisions that need to be made as circumstances and opportunities change. It is based on a biological assessment of the priority representative areas which, if effectively conserved, will ensure the persistence of biodiversity, ecological integrity and ecosystem dynamics. This technical report aims to provide a summary of the outcomes of this phase of the ecoregional process.

An Ecoregional Action Plan (EAP) – is a comprehensive conservation and sustainable marine resource management plan of action for the ecoregion, agreed and implemented by all stakeholders. Taking an ecoregional approach to conservation and sustainable marine resource management aims, however, to add value and definition to existing and planned conservation frameworks and paves the direction for the further development of conservation strategies.

2.0 Background

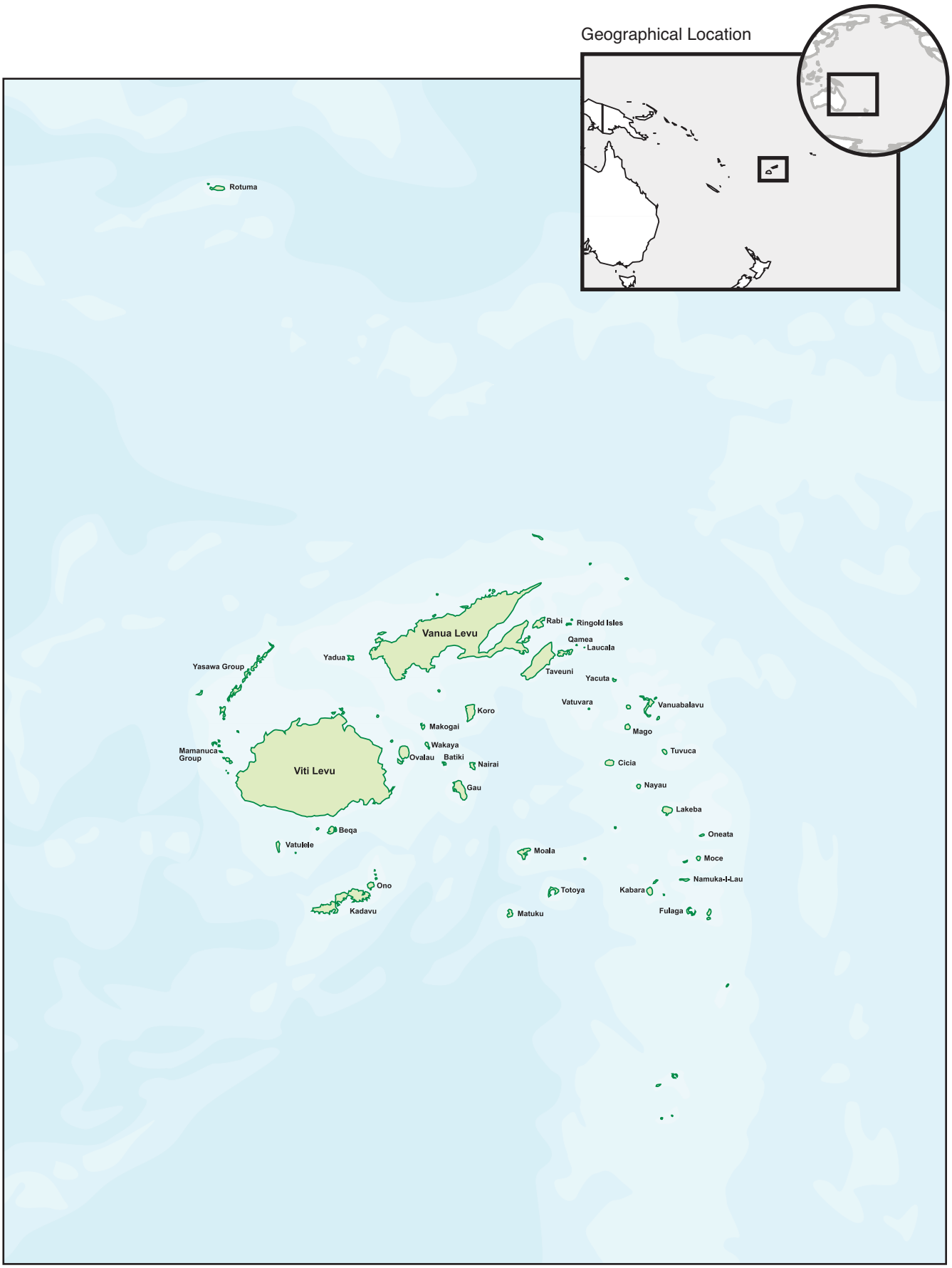
2.1 The Fiji Islands Marine Ecoregion

The Fiji Islands Marine Ecoregion (FIME) is comprised of approximately 844 high islands, cays and islets dispersed between latitudes 177-178^{0}W and longitudes 15-23^{0}S. With a total land area of 18,500 km^2, it lies at the mid-point of the two convergent zones, Tonga Kermadec and New Hebrides, and is separated by the Fiji Basin to the west and the Lau Basin to the east. In addition, Fiji's Exclusive Economic Zone occupies a total area of 1.29 million km2. Fiji's islands are largely volcanic, with a few atoll islands in the Lau Group (Vuki *et al*., 2000). Oceanic activity is characterized by predominantly south-easterly swells throughout the year, though during the period between July and December there are significant easterly swells. Tides are generally diurnal. Sea surface temperatures have an annual average of between 24ºC to 31ºC and surface salinity levels are 35o/00 in most cases, except during periods of heavy rainfall. The annual mean tidal range is limited at only 1.1m. The mean range of neap tides is 0.9m and spring tides 1.3m. Strong tidal currents occur 3 hours before and after low and high tides in lagoons, and the amount of water entering lagoons over reefs and through passages are also dependent on tidal heights (Vuki *et al*., 2000).

It is estimated that there are around one thousand coral reefs in Fiji (Zann, 1992). The geomorphology of the reef systems found throughout FIME is varied and diverse. The reef systems are known to be sensitive to sedimentation, flooding and cyclones amongst other stresses, such as the outbreak of the crown-of-thorns starfish, *Acanthaster planci*, and bleaching events.

Traditionally, coastal communities have relied heavily on marine resources for subsistence and other traditional uses. The major sources of economic growth and livelihood are currently fisheries, which accounts for 1.5% of GDP, and the expanding tourism sector, which presently accounts for 17% of the GDP.

Map 1: Fiji Map



2.2 The biological diversity of the Fiji Islands Marine Ecoregion

The Fiji Islands Marine Ecoregion (FIME) is of particular biological significance in global terms because of the extent and remoteness of its shallow tropical marine habitats. Created by the tectonic convergence of several oceanic plates, the uplifted shallow platform is surrounded on all sides by deep, oceanic conditions, making it a likely significant repository for medium to high levels of marine diversity and endemism. Fiji's reefs have had relatively few scientific assessments but early investigations indicate high levels of cryptic speciation. Recently, WWF-Fiji lead an expedition to assess the biological diversity of the Great Sea Reef to the north of Vanua Levu, known locally as Cakaulevu, which was identified as an area of global biodiversity importance during the biological visioning workshop. In addition, a biological survey of the Kubulau coast of Bua by the Wildlife Conservation Society (WCS) was completed in 2005, generating further information. Further research is likely to reveal a much greater level of biodiversity complexity than previously recognized. Tropical marine biodiversity levels drop away steeply to the east of Fiji, which again indicates that within the Western Pacific, the reefs of Fiji are an important repository of biodiversity in a region characterised by isolated oceanic islands and atolls.

Marine Mammals

The warm waters provide migratory routes for twelve species of cetacean (Annex 4). Four of these species are considered to be endangered or vulnerable by the International Union for Conservation of Nature (IUCN) redlist, namely the blue whale (*Balaenoptera musculus*), sei whale (*Balaenoptera borealis*), humpback whales (*Megaptera novaeangliae*) and the sperm whale (*Physeter macrocephalus*).

Seabirds

Fiji has an extensive and diverse range of marine habitats which include estuaries, mangroves, wetlands, seagrass beds, coral reefs, protected and exposed soft shores, lagoons and sand dunes. These habitats provide important feeding and breeding areas for about 10 species of migratory and resident sea birds, including frigate birds (*Sula sula*) and the Fiji Petrel (*Pseudobulweria macgillivrayi*) (Clunie, 1985).

Marine turtles

FIME's sea grass meadows and sandy beaches provide feeding and breeding areas and migratory routes for five of the world's seven species of marine turtles - the Green (*Chelonia mydas*), hawksbill (*Eremochelys imbricata*), loggerhead (*Caretta caretta*), Olive Ridley (*Lepidochelys olivacea*) and leatherback (*Dermochelys coriacea*) (Zann, 1992). All of these species are listed on the Convention for the International trade in Endangered Species (CITES).

2.2 The biological diversity of the Fiji Islands Marine Ecoregion

Fish species

Current information on marine fish species in Fiji is relatively comprehensive, yet most of the islands and reefs remain unsurveyed. Baldwin and Seeto (1986) listed a total of 1198 pelagic, deep water and reef fish from 162 families. The common fishes are parrot fish (*Scaridae*), rabbit fish (*Siganidae*), surgeon fish (*Acanthuridae*), groupers (*Serranideae*), snappers (*Lutjanidae*), moray eels (*Muraenidae*), and emperors (*Lethrinidae*), as well as species prized by the live reef food fish trade and aquarium trade, such as Napoleon Wrasse (*Chelinus undulatus ruppell*).

The open oceans are important for many species of pelagic fish including several species of tuna. Fisheries are the third largest export industry in Fiji, accounting for 1.5% of Gross Domestic Product (GDP). FIME Exclusive Economic Zone is one of the world's richest fishing grounds for tuna and according to the National Tuna Management Plan account for 15% of the catch in the Pacific Islands region.

Sea Snakes

Fiji's estuaries, mangroves, wetlands, seagrass beds, coral reefs, protected and exposed soft shores, lagoons and sand dunes also provide important habitats for 3 species of sea snakes, including the banded sea snake (*Laticauda colubrine*), the black banded robust sea snake (*Hydrophis melanocephalus*) and the yellow bellied sea snake (*Pelanis platurus*) (Guinea, 1980).

Invertebrates

It is also estimated that 15 species of sea cucumber of commercial or subsistence value are found in Fiji. Eighty species of marine Gammaridian amphipod are currently known and substantial collections of shallow water amphipods have been described, 41% of all taxa endemic to Fiji (Meyers, 1985). Crab species found in Fiji include the coconut (*Birgus latro*), mud (*Thalassina anomala*), black mangrove (*Metopograpsus messor*), land crab (*Cardisoma carnifex*), red clawed (*Gesarma erythrodactyla*), swimmer (*Thalamita crenata*), the threespot reef crab (*Carpilius maculatus*), and the redeye crab (*eriphia sebana*) (Lewis, 1986). Lobster species include the golden rock lobster, *Panulirus penicillatus*, and the banded prawn killer (*Lysiosquilla maculate*) (FFA, 1994).

Annex 1 gives further examples of known marine biodiversity within FIME, although this is likely to be superceded by new data following the survey expeditions carried out in 2005 for the Great Sea Reef, the third largest barrier reef in the world.

Corals

Corals are an essential and dominant part of coral reef communities, and play a key role in determining the composition and nature of reef systems. Knowledge of Fijian corals remains incomplete, with the most detailed description to date being that of 198 species from the Mamanucas and southern Viti Levu (Zann, 1992). Other notable descriptions include: 100 species of stony coral identified from the Great Astrolabe Reef, Kandavu (Paulay 1990, 15 species of zoanthids described from Viti Levu (Muirhead and Ryland, 1981), and 5 species of gorgonian corals or sea fans (Muzik and Wainwright, 1977).

3.0 Objectives of the FIME Biodiversity Visioning Workshop

In December 2003, WWF brought together over 80 stakeholders (Annex 2) to discuss the importance of and gather information on the biodiversity and associated threats to Fiji's marine environment. The FIME Biodiversity Visioning Workshop (Annex 1) aimed, amongst other priorities, to add value and definition to the existing National Biodiversity Strategic Action Plan, mapping out priority areas for conservation.

3.1 Overall biodiversity conservation goals

In order to prioritise the conservation and restoration of the fullest possible range of biodiversity, criteria have been developed for each step of the process, based on the need to address the following goals of biodiversity conservation:

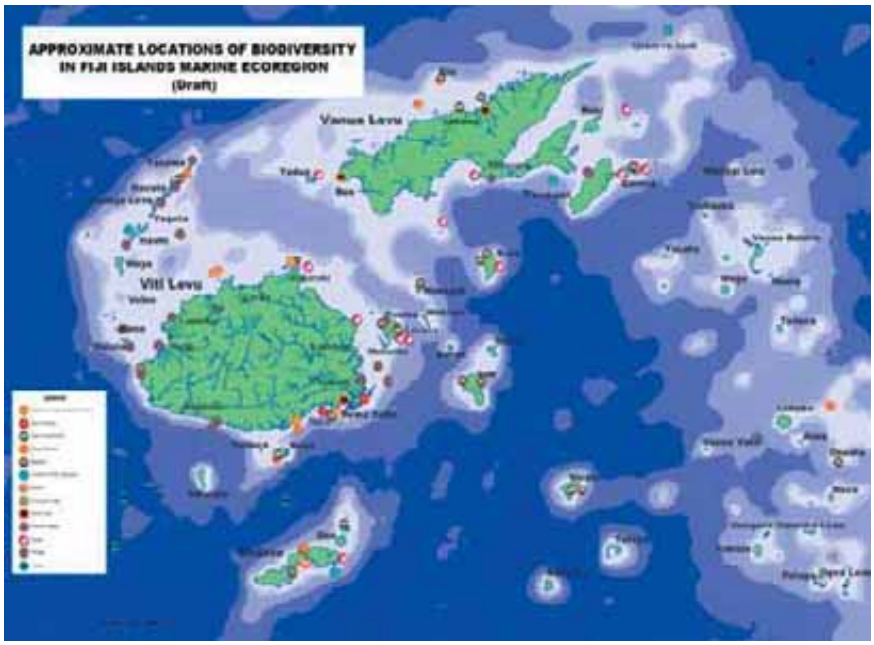
1. The representation of all distinct natural communities and species.
2. The maintenance of ecological and evolutionary processes that create and sustain biodiversity.
3. The maintenance of viable populations of species.
4. The conservation of natural habitats large enough to withstand periodic disturbances and long-term changes.

3.2 Specific goals of the FIME biodiversity visioning workshop

The overarching goal of ecoregion conservation is to conserve and restore the fullest possible range of biodiversity over large spatial and temporal scales. FIME's visioning goals included:

- Setting taxonomic priorities.
- Setting overall biodiversity priorities.
- Understanding the Conservation context.
- Drafting a conservation vision.

Figure 2: Location of threats to the biodiversity of the FIME



4.0 Methodology

4.1 Setting Taxonomic priorities

Several preparatory meetings prior to the workshop were held to raise awareness of the intended process and to agree on criteria for planning. Key stakeholders, including scientists, government and non-governmental organization representatives, community members and interested user groups were invited to provide opinion on how FIME should be categorized in terms of sub-regions and taxonomic sub-groupings.

Priority areas were identified and described for each of the separate key taxonomic/ community groups, taking care to ensure representation of the group across the entire ecoregion. Most groups are based around a particular habitat type, but attention was also given to species of special concern or those which required specific management needs. Participants were divided into the following focal biodiversity groups:

- Coastal terrestrial vegetation and small offshore islands
- Coral reefs and associated fauna (non-fish)
- Coral reef fish
- Inshore ecosystems
- Open ocean/pelagic ecosystems
- Species of special concern
- Community knowledge about habitats and species

Participants in the groups identified individual priority taxonomic areas for the whole ecoregion, and described the features of those areas. Each group also included species that require special management needs, either because they have life histories that render them vulnerable or because they are being harvested unsustainably. Criteria were provided to help the working groups select priority areas for each focal biodiversity group. These include important feeding, breeding or nesting sites, seasonal migration sites, sites important for ecological processes, representative habitats or community types, sites of outstanding species richness, unique physical habitats and unique or endemic species assemblages. Each selected area was assigned a code and detailed information was collected.

4.2 Setting overall biodiversity priorities

Working in sub-regions, the results of individual Focal Biodiversity Groups were brought together and overall biodiversity priority areas were identified. These are areas that capture the most important biodiversity features, create links or integrated seascape and landscape features, and which ensure representation of important ecological processes as well as compositional aspects of biodiversity.

FIME was sub-divided into five separate sub-regional groups, as outlined in Table 2. Experts with a range of taxonomic expertise identified priority biodiversity areas and described their features.

Table 2. FIME sub-regional descriptions

Sub-region	Description
Mamanuca-Astrolabe	This sub-region encompasses the Mamanuca group, Viti Levu and Kadavu. The Mamanuca and Yasawas have leeward, mid-shelf platform reefs. Southern Viti Levu has windward outer shelf barrier and fringing reefs. Beqa and Vatulele have windward, isolated shelf uplifting barrier reefs. Western and eastern Viti Levu has leeward, mid and inner shelf platform reefs.
Cakaulevu	This sub-region covers Vanua Levu, islands east of Vanua Levu, Taveuni and Namenalala. It has one of the unique barrier reefs with numerous channels. It has leeward outer-shelf reefs, shoals and barrier reef systems.
Bligh Waters	This sub-region covers the Vatu-i-ra channel, Gau, Koro Island, Makogai, Ovalau. The area has unique deep water channels and intact ecosystems.
Lau	Small islands and atolls with a deep water trench, the Lau trench, considered to be a unique feature globally. Hydrographically, the Tonga Trench (which also extends to the Lau Group) is regarded as an 'international trans-boundary' because it crosses into Tongan territory. Uplifting, fringing barrier platform and oceanic ribbon reefs are also characteristic of the Lau Group.
Rotuma	An isolated island with unique fish and coral distributions and extensive offshore fisheries areas at isolated shelf, fringing and platform reefs.

Criteria and maps were provided to aid the selection and setting of boundaries for the overall priority biodiversity areas and to guide the discussion, ensuring that the four goals of biodiversity were being met by the suite of areas selected. Maps showing the individual taxonomic areas were provided to each sub-regional group and copies of the individual completed taxonomic forms were made available.

This exercise was not simply aimed at identifying areas that captured the greatest number of taxonomic priorities. An overall priority area might only touch on one or two individual taxonomic priority, but may still be justifiably chosen as a high ranking biodiversity priority area if it contains a unique assemblage or is the site of an ecological process that is fundamental to the ecoregion. It is also important to note that an overall biodiversity priority area is not necessarily the intersection of taxonomic areas, nor is it necessarily the summation of taxonomic priority areas. The position of individual taxonomic priority areas is again intended to guide discussion, but it is the biodiversity characteristics of the larger system that should be the basis of selection.

Each of the selected biodiversity priority areas was assigned a code and detailed information was collected, referring back to the taxonomic priority area forms where necessary. Information was also requested on information sources, relevant institutions working in the area, information gaps, and research needs. Once all sites were selected for each sub-region, experts assigned a relative rank for the overall importance of the area (i.e. whether the area was considered to be of global, ecoregional or sub-regional importance). In order to establish these rankings, participants were asked to assess whether removing that individual area from the system would result in impacts that were significant at the Indo-Pacific, Fiji Islands Marine Ecoregion or sub-regional scale.

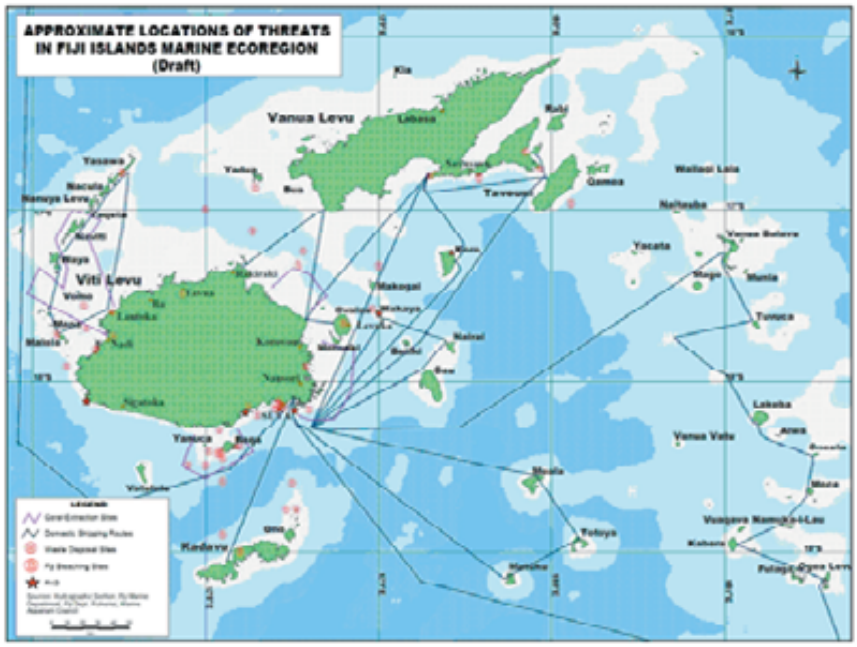
4.3 Understanding the Conservation Context

Additional data layers were collected to inform conservation planning. For each priority conservation area, information was collected on current status, future threats and resilience, along with information on current conservation activities and urgent needs or information gaps.

4.4 Drafting a Conservation Vision

Turning the plan into action requires building political will and inspiring key stakeholders to support conservation efforts. Key to this is creating a conservation vision for the ecoregion that expresses what success would look like in both human and biodiversity terms.

Figure 3:



5.0 Results

5.1 Taxonomic Priorities

A total of 125 priority areas were identified and agreed by the 7 Focal Biodiversity Groups as listed below:

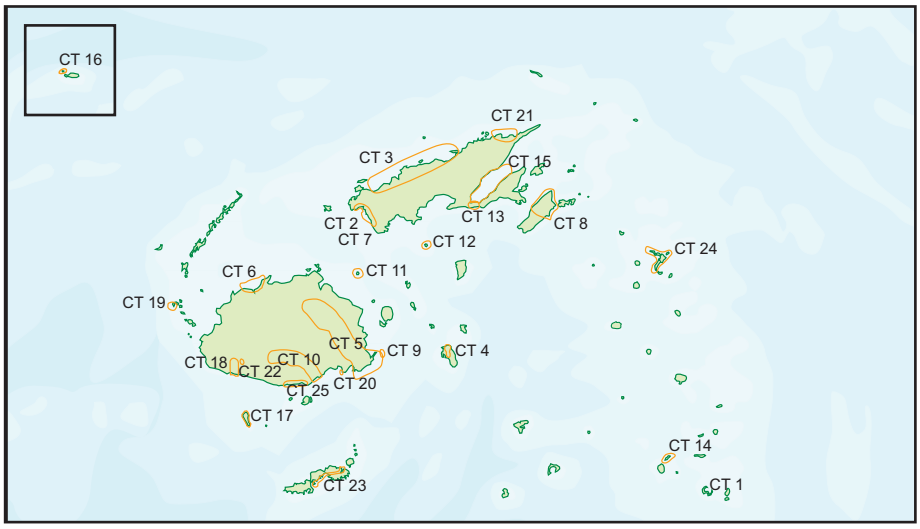
- 13 Coral Reef areas
- 27 Coral Fish areas
- 13 Inshore Ecosystem areas
- 25 Coastal terrestrial and Offshore Island areas
- 14 Open Ocean areas
- 15 Species of Special Concern areas
- 18 Community priority areas

5.1.1 Coastal terrestrial vegetation and small offshore islands

This group encompassed the zone in transition from being strictly marine to terrestrial and includes coastal littoral vegetation, small offshore islands, soft sedimentary shoreline habitats, coastal substrate, brackish water habitats, mangroves, lagoons, coastal lakes, inland pools, sand dunes, breeding grounds for important species such as crabs, sea snakes, birds, turtles and freshwater fish species.

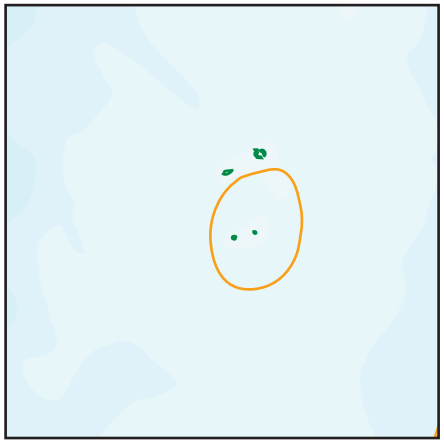
Altogether 23 priority areas were identified in this zone mainly for their uniqueness, endemism and representation of habitats, species and processes (Map 2).

CT1 Fulaga **CT2** Lekutu System **CT3** North coast Vanua Levu, west of Labasa **CT4** Montane Cloud Forests of Gau **CT5** Rewa River Delta & Watershed **CT6** Ba Delta **CT7** Bua village mangroves **CT8** east Taveuni **CT9** Mabualau, Toberua **CT10** Navua Catchment **CT11** Vatu-i-ra **CT12** Namena Island **CT13** Qaloqalo salt lake, Natewa Bay **CT14** Vuaqava, Kabara **CT15** Natewa Peninsula **CT16** Hatana & Hofliua, Rotuma **CT17** Vatulele Island **CT18** Sigatoka Catchment **CT19** Manuriki, Mamanuca **CT20** Suva Point Mudflats **CT21** Naweni **CT22** Nadrala, Nadroga **CT23** Kadavu and South Mangroves **CT24** Vanuabalavu **CT25** Galoa, Serua.



MAP 2

5.1.1 Coastal terrestrial vegetation and small offshore islands

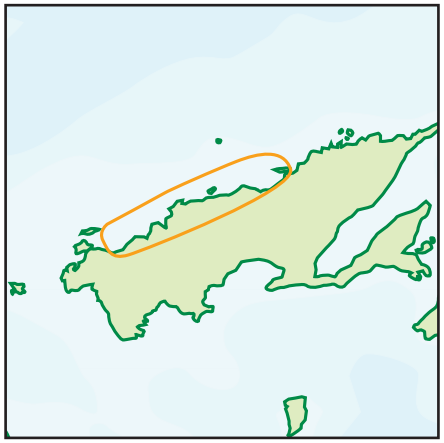


CT1- Fulaga
Location: Lau Group.
Lat: 19.170S **Long:** 178.650W
Approximate land area:18.5 km2
Estimated reef area: 55 km2
Estimated population density: 25/ km2

Description of area:
Dense limestone forest with Pritchardia, a concentration of Fiji fan palms unique in Fiji. The interesting outlay of limestone islets creates marine caves, fringing and atoll reefs and lagoons which host seagrass meadows with Halodule species dominant. Fulaga has land crab breeding areas.

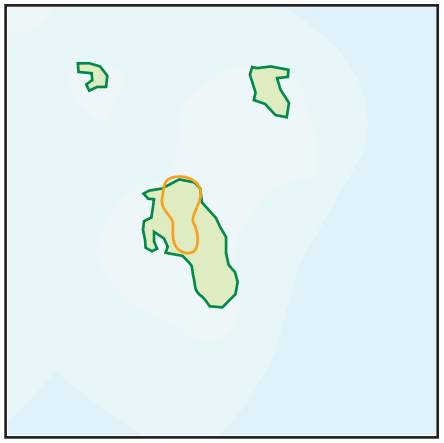
CT2- Lekutu System
Location: Nabouwalu, Bua
Approximate land area: 1,378 km2
Estimated population density: 11/ km2

Description of area:
Fused conglomerate river bed. The only known habitat of endemic red goby species (*Redigobius leveri*).



CT3- coast Vanua Levu
Location: West Labasa, Macuata
Approximate land area: 2,004km2
Estimated population density: 40/ km2

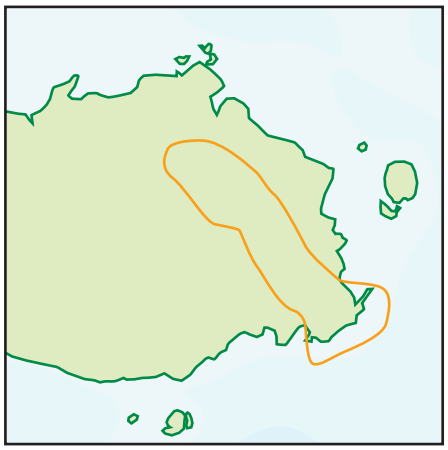
Description of area:
The Bainivualiku is an offshore/coastal mangrove forest which extends along the Macuata coast. It is considered to be an important spawning ground for fisheries and has a unique offshore mangrove forest.



CT4- Montane Cloud, Forests of Gau
Location: Gau Island, Lomaiviti Group
Lat: 18.000S **Long:** 179.300E
Approx. land area: 136.1 km2
Estimated population density: 40/ km2

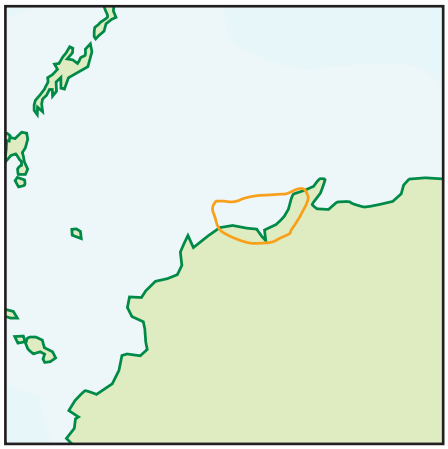
Description of area:
Dense rainforest on high land and ridges; grasslands with ironwood, Casuarina equisetifolia (*nokonoko* in Fijian). The Montane Cloud forest provides habitat for breeding frigates, boobies and burrows for 3 petrel species, the collared petrel (*Pterodroma brevipes*), Tahiti petrel (*Pseudobulweria rostrata*) and the endemic Fiji Petrel (*Pseudobulweria macgillivrayi*) (*kacau ni Gau* in Fijian). The coast is characterized by mangroves, fringing reefs, leeward barrier reefs and an extensive deep lagoon.

5.1.1 Coastal terrestrial vegetation and small offshore islands



CT5-Rewa River Delta & Watershed
Location: Rewa, Viti Levu
Approximate land area: 272 km2
Estimated population density: 373/km2

Description of area:
The Rewa river has the largest catchment area, covering one third of the island of Viti Levu. The delta hosts the largest and most diverse area of mangrove, including the Bonatoa Swamp, the largest peat swamp in Fiji. This is an important brackish freshwater system, providing a high diversity of estuarine/ freshwater fish

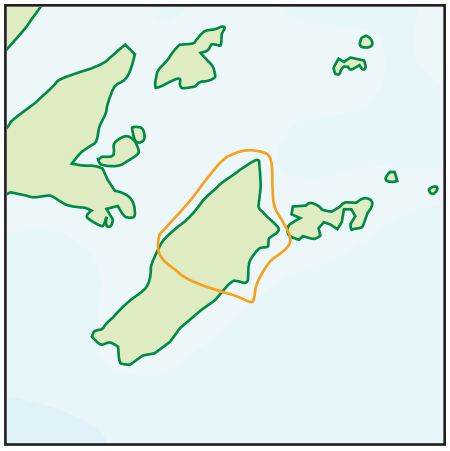


CT6- Ba Delta
Location: Ba, Viti Levu
Approximate land area: 2,634 km2
Estimated population density: 58/ km2

Description of area:
The Ba River, combined with the Nadi River catchment area, cover 15% of Viti Levu and include extensive saline mudflat areas and mangroves supporting productive fisheries and range of habitats supporting a wealth of fish biodiversity.

CT7- Bua village mangroves
Location: Bua, Vanua Levu
Approximate land area: 1,378 km2
Estimated population density: 11/ km2

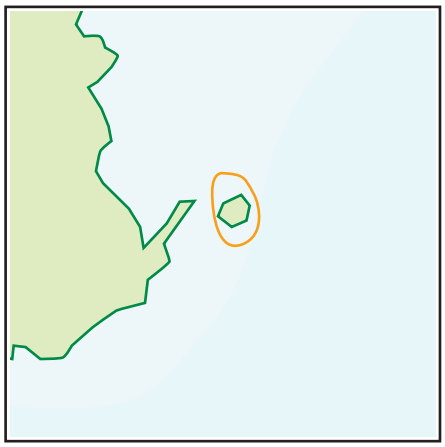
Description of area:
The only known large mature mangrove ecosystem in south-western Vanua Levu. Located in a well sheltered bay.



CT8- NE Taveuni
Location: Cakaudrove
Lat: 16.850S **Long:** 179.950E
Approximate land area: 442.1 km2
Estimated population density: 16/ km2

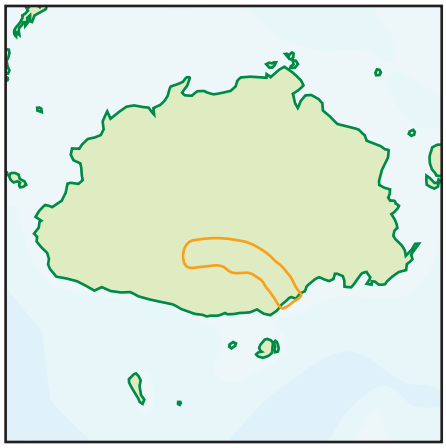
Description of area:
A volcanic island with lowland and montane rainforests in the centre and to the east of the island, in which a lake, mountain stream and other freshwater habitats are located. The islands has a rocky coastlines and scattered fringing reefs. Taveuni has representative and unique mangrove assemblages.

5.1.1 Coastal terrestrial vegetation and small offshore islands



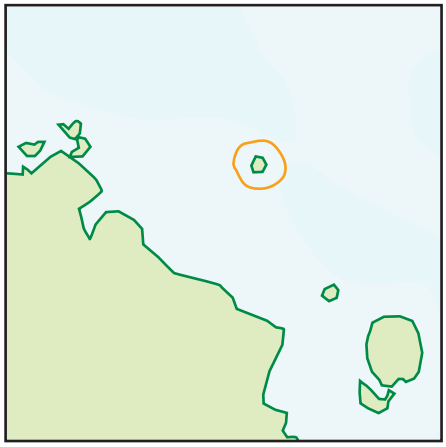
CT9- Mabualau, Toberua Islands
Location: Lomaiviti
Approximate land area: 411 km2
Estimated population density: 21/ km2

Description of area:
An upraised limestone islet. Mangrove forest reserves with a protected area for seabirds and nesting boobies.



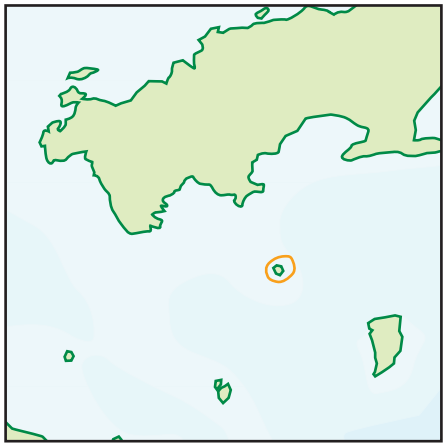
CT10- Navua Catchment
Location: Serua, Viti Levu
Approximate land area: 830 km2
Estimated population density: 19/ km2

Description of area:
The Navua river is one of 3 river systems located in the central division of Viti Levu. The catchment area includes the Melimeli and Vunimoli peat swamps. The latter is the only extensive swamp forest in Fiji (262 ha).



CT11- Vatu-i-ra
Location: Bligh Waters, Bua.
Approximate land area: unknown
Estimated population density: uninhabited

Description of area:
Vatu-i-ra is a small island located about 20km off the east coast of Viti Levu. Known also as Bird Island because of the huge population of resident seabirds.



CT12- Namena Island
Location: Bligh Waters, Bua
Lat: 17.110S **Long:** 179.100E
Approximate land area: 0.445 km2

Description of area:
Namena Barrier Reef approximately 19 miles long surrounds the island. There is a resort on the island which manages a community and resort managed Marine Protected Area.

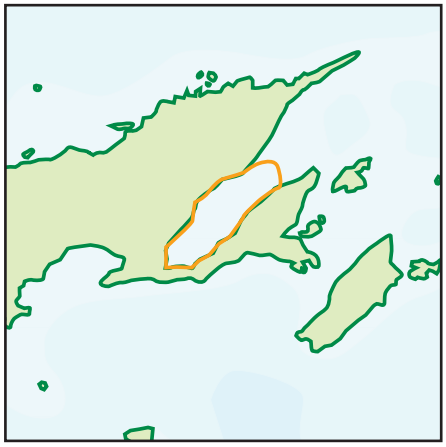
5.1.1 Coastal terrestrial vegetation and small offshore islands

CT13- Qaloqalo salt lake, Natewa Bay
Location: Cakaudrove, Vanua Levu
Lat: 16.460S **Long:** 179.310E
Approximate land area: 150 ha
Estimated population density: 16/ km2

Description of area:
The salt lake is located on a narrow isthmus south of Natewa Bay; rich in marine species. The lake has tidal flushing and is surrounded by a wide band of mangrove forest.

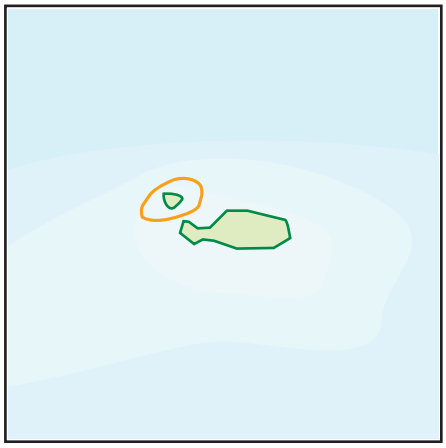
CT14-Vuaqava Island
Location: Kabara, Lau
Lat: 18.830S **Long:** 178.920W
Approximate land area: 7.7 km2
Population: uninhabited

Description of area:
A salt lake located in the interior of the island; this lake is used by Kabara islanders as a turtle pen. Mangrove and marine species are believed to be of interest but are not yet researched.



CT15- Natewa Peninsula
Location: Cakaudrove, Vanua Levu
Approximate land area: unknown
Etimated population density : 48.21 / km2

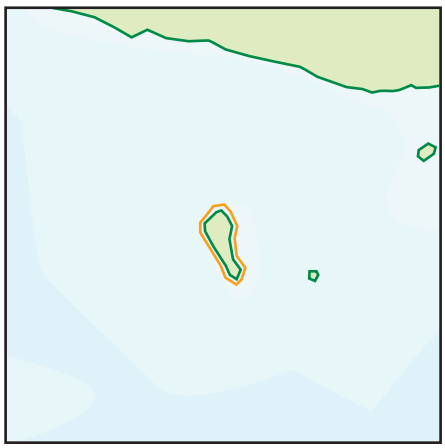
Description of area:
The Buca and Nala River systems are amongst the most pristine and intact sites identified, notable for their high amphidromous fish species (at least 6 species) and high levels of endemism.



CT16- Hatana & Hofliua Island
Location: Rotuma
Lat: 12.500S **Long:** 177.130E
Approximate land area: 44 km2
Estimated population: uninhabited

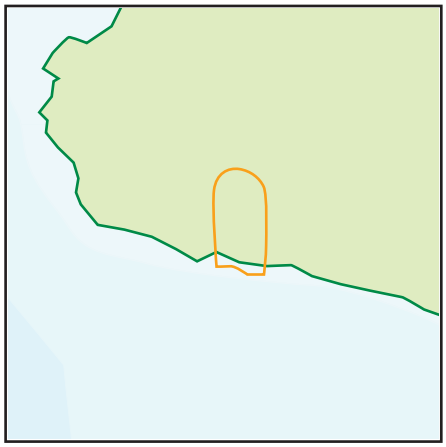
Description of area:
Rotuma is a volcanic island surrounded by 3 small volcanic islets and 5 reef islets.

5.1.1 Coastal terrestrial vegetation and small offshore islands



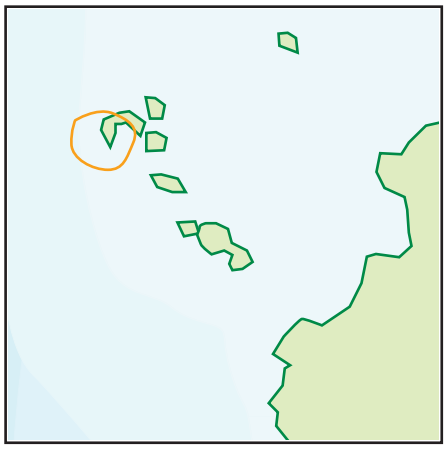
CT17- Vatulele
Location: Rewa
Lat: 18.500S **Long:** 177.630E
Approximate land area: 31.6 km2
Estimated population density: 28.92/ km2

Description of area:
Fresh and salt water pools, with populations of red prawns, Arteseomorpha foliacea.



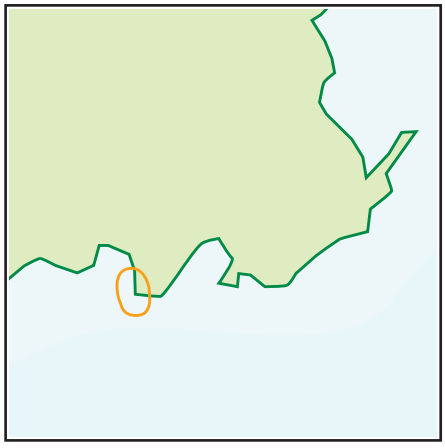
CT18- Sigatoka Catchment
Location: Nadroga/Navosa
Approximate land area: 2,385 km2
Estimated population density: 23/ km2

Description of area:
Only existing sand dune formation in the South Pacific; site of lapita pottery and dry littoral forests.



CT19- Manuriki
Location: Mamanuca, Yasawa, Ba
Approximate land area: unknown
Estimated population density: uninhabited

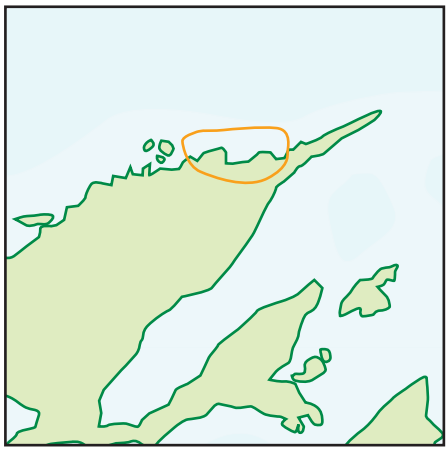
Description of area:
A rugged island with dry coastal forest. A breeding site for the wedge-tailed shearwater Puffinus pacificus, a migratory seabird which visits the island from October to May annually.



CT20- Suva Point Mudflats
Location: Suva, Rewa
Approximate land area: 272 km2
Estimated population density: 373 km2

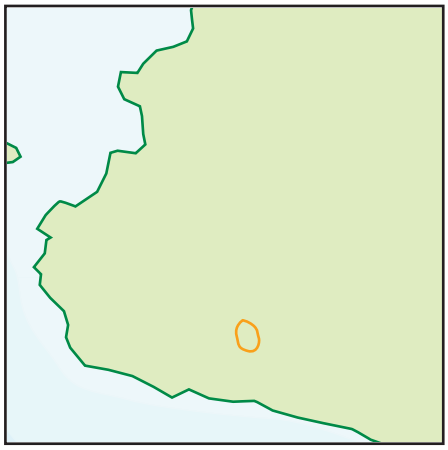
Description of area:
Highly productive, large expanse of tidal mudflat important for shorebirds. The area has been surveyed for shorebirds for the past 5-10 years by Dick Watling.

5.1.1 Coastal terrestrial vegetation and small offshore islands



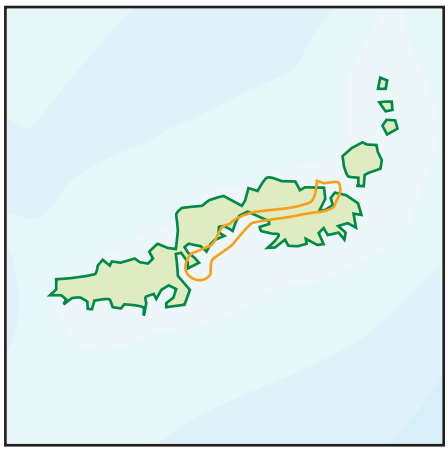
CT21- Naweni
Location: Cakaudrove, Vanua Levu
Approximate land area: 2816 km2
Estimated population density: 4 / km2

Description of area:
Two saltwater limestone pools fringed with mangroves, hosting endemic red prawns.



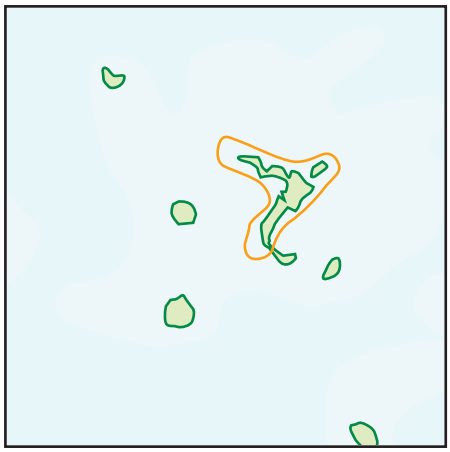
CT22- Nadrala, Nadroga
Location: Viti Levu
Approximate land area: 2,385 km2
Estimated population density: 23/ km2

Description of area:
An inland lake situated about 10km from the coastline.



CT23- South mangroves
Location: Kadavu
Lat: 19.050S **Long:** 178.250E
Approximate land area: 478 km2
Estimated population density: 20/ km2

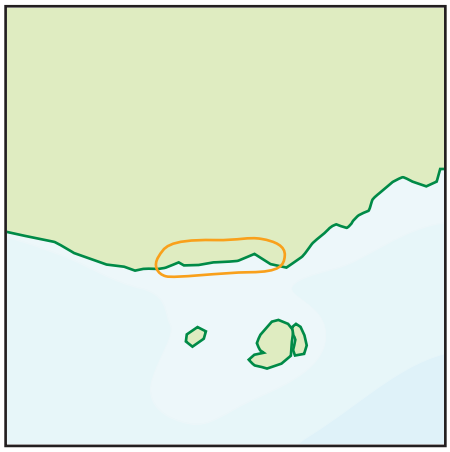
Description of area:
Mangroves found in sheltered bays such as Vunisea and Soso on the South coast. More information is needed on mangrove diversity and associated flora and fauna.



CT24- Vanuabalavu
Location: Lau Group
Lat: 17.250S **Long:** 178.920W
Approximate land area: 53 km2
Estimated population density: 2.36/ km2

Description of area:
A volcanic island with fertile soil. Rugged raised coral reefs with steep undercut cliffs. An extensive reef system including the Qilaqila bay of islands with scenic undercut raised coral islets.

5.1.1 Coastal terrestrial vegetation and small offshore islands



CT25- Galoa, Serua
Location: Serua, Viti Levu
Approximate land area: 830 km2
Estimated population density: 19/ km2

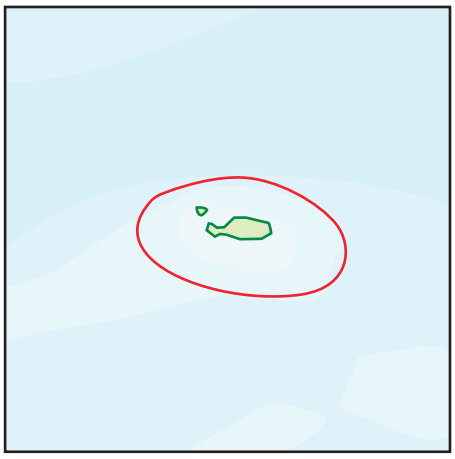
Description of area:
This area has the largest patch of wild Sago swamp, Metroxylon vitiensis, a plant species endemic to Fiji.

5.1.2 Coral reefs and associated fauna

FIME has one of the most complex and extensive coral reef systems in the western Pacific. It is estimated that there are around one thousand coral reefs in Fiji (Zann, 1992). Reef sizes vary from less than 50 m to 370 km long. The diversity of reef types include patch, fringing, barrier, platform, oceanic, ribbon, drowned, atolls and near-atolls. The most common reef types are fringing reefs and barrier reefs.

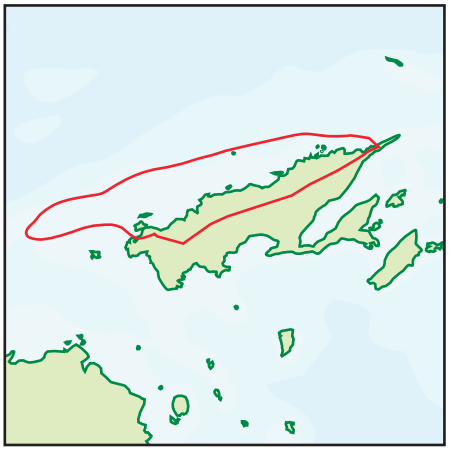
The reefs of FIME are historically healthy but are currently under threat from environmental stressors such as bleaching, pollution, physical damage from unsustainable fishing practices and unsustainable harvesting for the aquarium trade. Set criteria for prioritizing sites included uniqueness, rarity, resilience to bleaching and representation within a single reef system. Based on existing information, the group identified 13 outstanding or priority areas for coral reefs.

CR1 Rotuma **CR2** Great Sea Reef **CR3** Southern Lau **CR4** Cakaudrove **CR5** Lomaiviti **CR6** Namena/Savusavu **CR7** Vatu-i-ra Channel **CR8** Viti Levu Coast **CR9** Mamanuca and Yasawa **CR10** Coral Coast **CR11** Beqa/Vatulele **CR12** Naselai-Ovalau, Bau waters **CR13** Kadavu

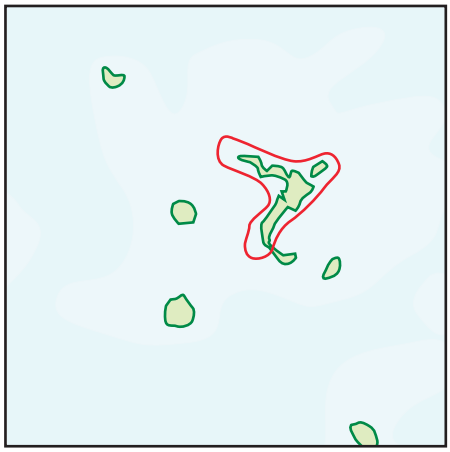


CR1-Rotuma
Estimated reef area: 44 km2
Known reef state: Healthy
Information status: Moderate
Type of information: physical features, coral species

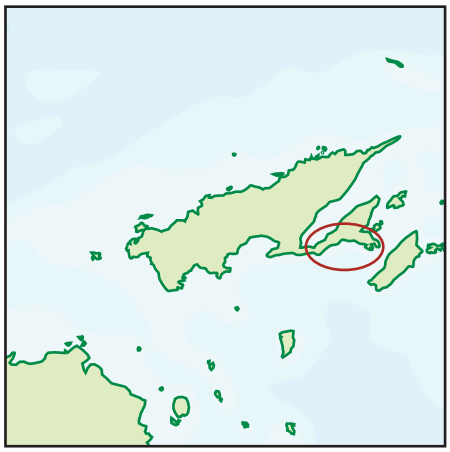
5.1.2 Coral reefs and associated fauna



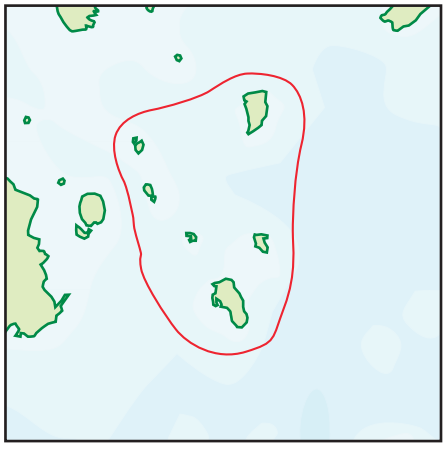
CR2-Great Sea Reef
Estimated reef area: 150km (length)
Known reef state: Healthy
Information status: Low
Type of information: physical features, turtle sightings



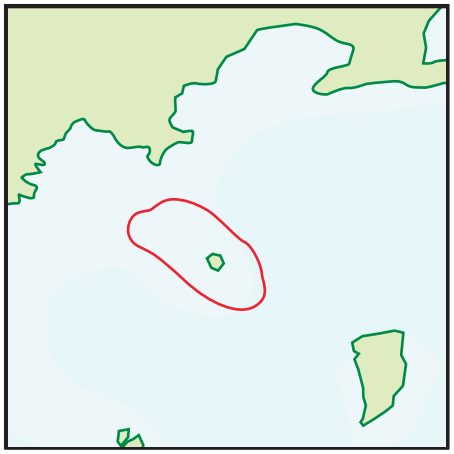
CR3-Southern Lau, Vanuabalavu
Estimated reef area: 53 km2
Known reef state: Moderate
Information status: Moderate
Type of information: physical features



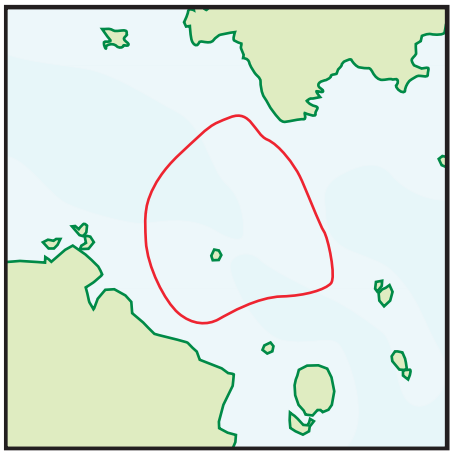
CR4-Cakaudrove
Estimated reef area: unknown
Known reef state: Moderate
Information status: Low
Type of information: physical features, soft corals



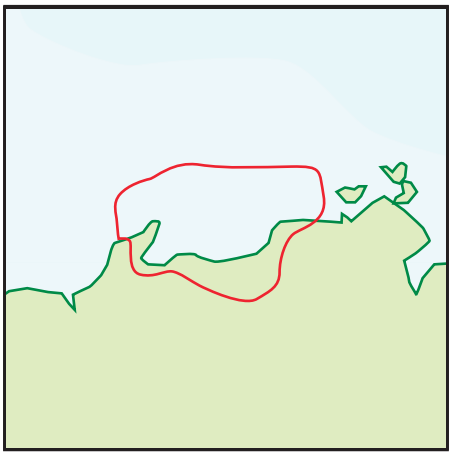
CR5-Lomaiviti
Estimated reef area: unknown
Known reef state: Healthy
Information status: Moderate
Type of information: physical features, crown-of thorns outbreak history



CR6-Namena/Savusavu
Estimated reef area: unknown
Known reef state: Healthy
Information status: Moderate
Type of information: physical and oceanic conditions, taxa biodiversity



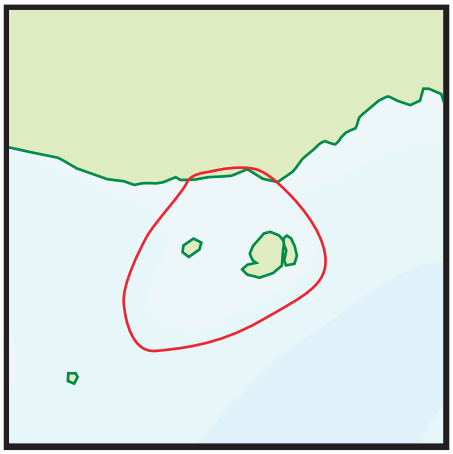
CR7-LVatu-i-ra Channel
Estimated reef area: unknown
Known reef state: Healthy
Information status: Moderate
Type of information: oceanic conditions, bleaching reslience



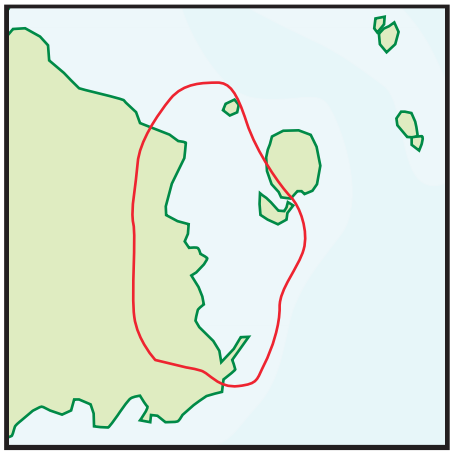
CR8-Viti Levu Coast
Estimated reef area: unknown
Known reef state: unknown
Information status: Low
Type of information: physical features, coral and soft coral diversity

CR9-Mamanuca and Yasawa
Estimated reef area: unknown
Known reef state: Healthy
Information status: High
Type of information: physical features

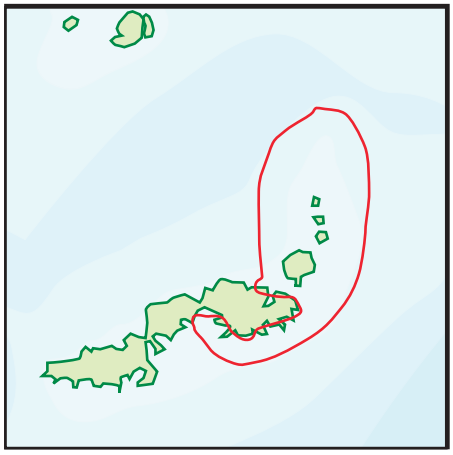
CR10-Coral Coast
Estimated reef area: unknown
Known reef state: Healthy
Information status: Moderate
Type of information: physical features



CR11-Beqa/Vatulele
Estimated reef area: 70 km2
Known reef state: Moderate
Information status: High
Type of information: physical features, coral bleaching and cyclone history



CR12-Naselai-Ovalau, Bau waters
Estimated reef area: unknown
Known reef state: Healthy
Information status: Moderate
Type of information: physical features

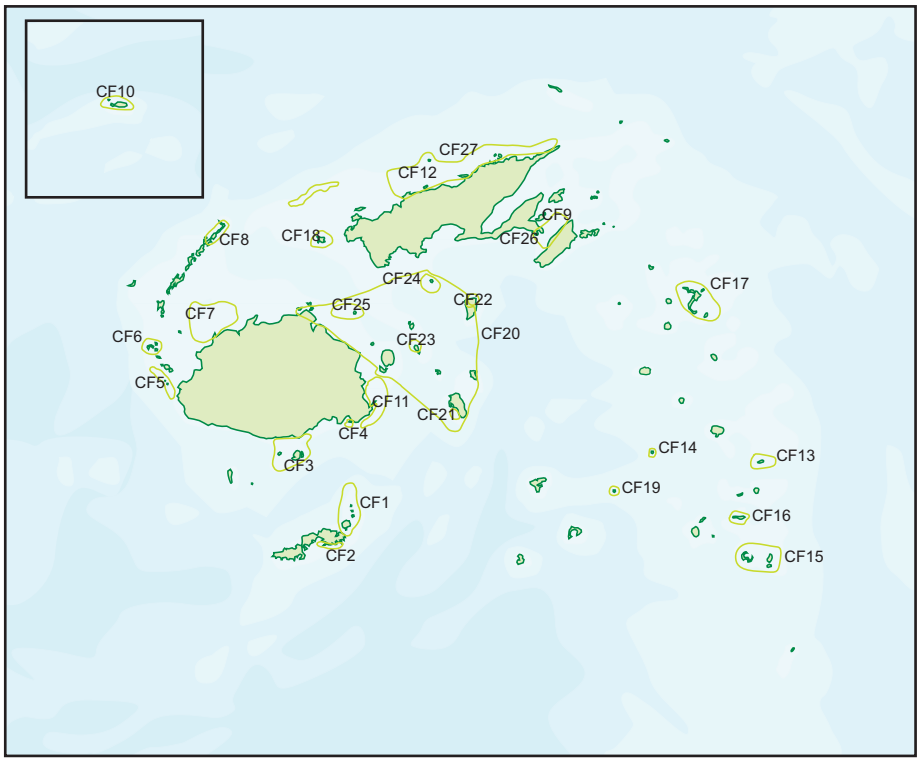


CR13-Kadavu
Estimated reef area: 450 km2
Known reef state: Moderate
Information status: High
Type of information: physical features, pelagic fish aggregation, localized coral and fish abundance

5.1.3 Coral reef fish

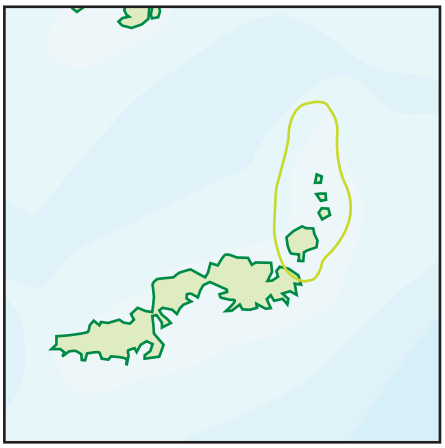
This group focused on reef areas with high abundance, richness, endemism and diversity of reef fish. Based on existing information, a total of 27 sites were identified as a priority for coral reef fish by the group (Map 3).

CF1 Great Astrolabe Reef & Ono Channel, Kadavu **CF2** Naceva Reef **CF3** Beqa lagoon barrier reef **CF4** Rewa river mouth **CF5** Navula Malolo Reef to include Tavarua and Namotu Island **CF6** Supermarket Reef, Mamanuca **CF7** Ba & Tavua **CF8** Yasawas **CF9** Natewa/Viwa **CF10** Rotuma **CF11** Naselai, Verata coastal region **CF12** Great Sea Reef **CF13** Oneata **CF14** Vanuavatu, Lau **CF15** Fulaga, Ogea levu, Lau **CF16** Namuka, Lau **CF17** Vanuabalavu **CF18** Yadua Island **CF19** Navatu Reef between Fulaga and Gau **CF20** Bligh Triangle/ Lomaiviti Triangle **CF21** Naigali Passage, Gau **CF22** Koro East Corner **CF23** Wakaya Reef **CF24** Namena Reef **CF25** Vatu-i-ra Passage **CF26** Somosomo Strait **CF27** Great Sea Reef of Yaqaga Island.

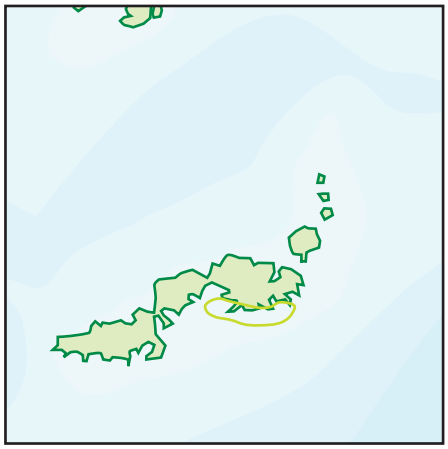


MAP 3: Coral Reef Fish

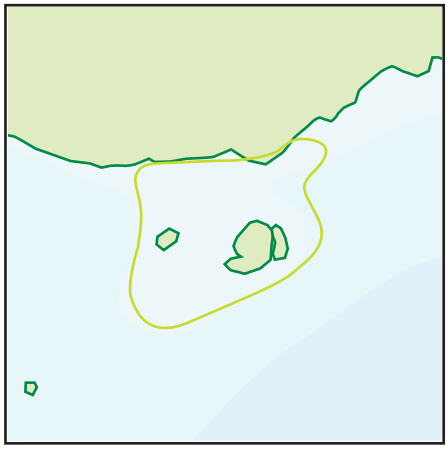
5.1.3 Coral reef fish



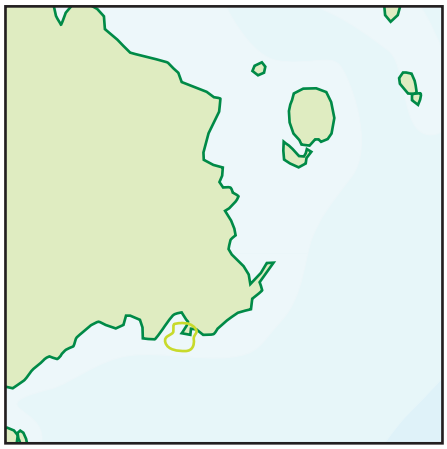
CF1-Great Astrolabe Reef and Ono Channel in Kadavu
Description of area: Large barrier reef system north of the island and extending from east to west of Kadavu.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown



CF2-Naceva Reef, Kadavu
Description of area: Soso Passage and other channels along the Naceva coast face the southeast tradewinds.
Known status of fish abundance and diversity: low
State of knowledge on fish aggregation: none



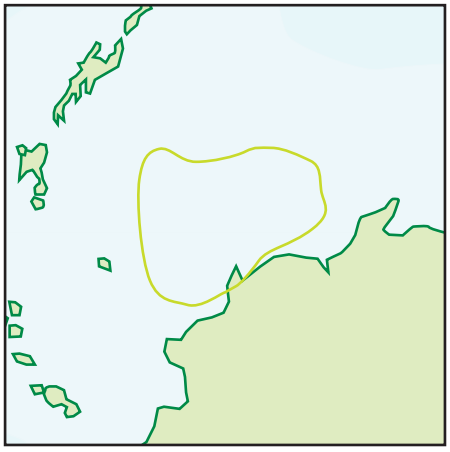
CF3-Beqa Lagoon, Barrier Reef
Description of area: leeward barrier reef that extends 40km offshore.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: moderate (sharks)



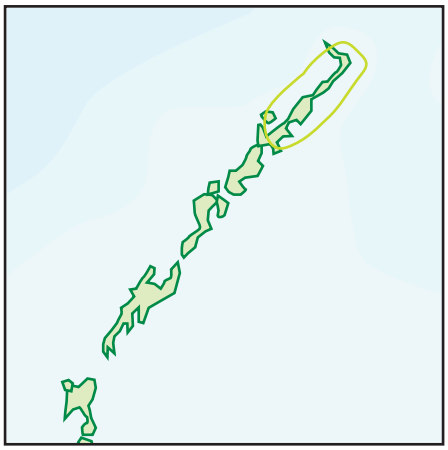
CF4-Rewa river mouth
Description of area: estuarine environment largely surrounded by mangrove systems.
Known status of fish abundance and diversity: low
State of knowledge on fish aggregation: moderate (bull sharks)

CF5-Navula-Malolo reef including Tavarua Island and Namotu Island
Description of area: a barrier reef system which encloses small barrier islands surrounded by patch reefs broken by 5 major channels (Momi, Navula, Malolo and Wilkes Passage).
Known status of fish abundance and diversity: high
State of knowledge on fish aggregation: moderate

CF6-Supermarket Reef, Mamanuca
Description of area: a deep patch reef popular tourist diving site.
Known fish abundance and diversity: moderate
State of knowledge on fish aggregation: high (including the shark feeding practices-tourist diving)



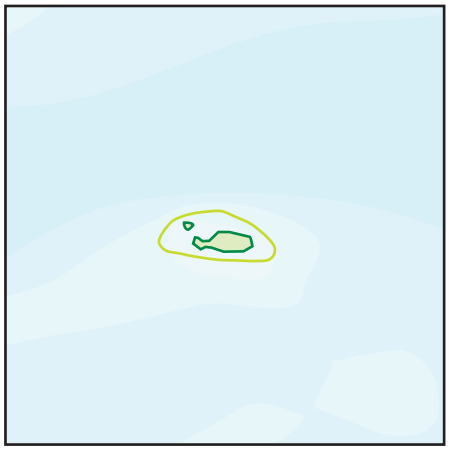
CF7-Ba and Tavua
Description of area: extensive mangrove flats adjacent high silted reef systems
Known status of fish abundance and diversity: unknown
State of knowledge on fish aggregation: unknown



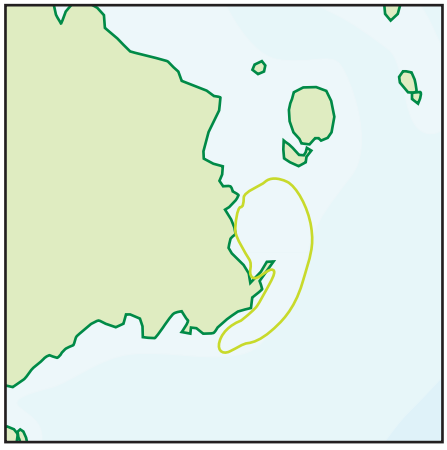
CF8-Yasawas
Description of area: seagrass habitats and fringing reefs surround chain of small islands on the west shelf of Viti Levu
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: low

5.1.3 Coral reef fish

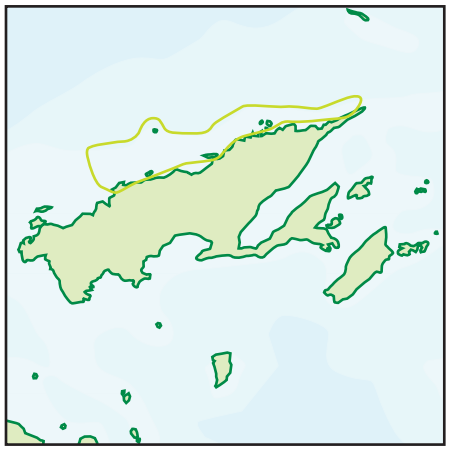
CF9-Natewa/ Vuna
Description of area: reef walls and promontories are found around this limestone island
Known status of fish abundance and diversity: low
State of knowledge on fish aggregation: low, but includes sightings of hammerhead sharks, Sphyrna leweni



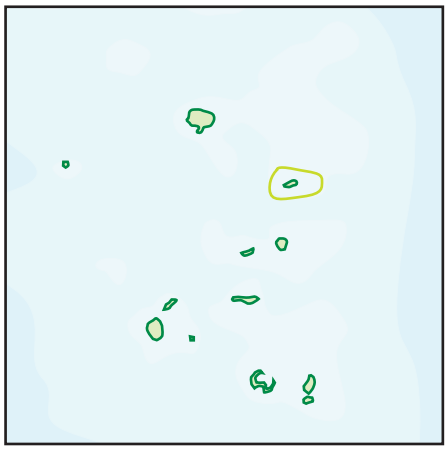
CF10-Rotuma
Description of area: A volcanic island connected by a sandy isthmus surrounded by an extensive fringing and barrier reef system.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: low



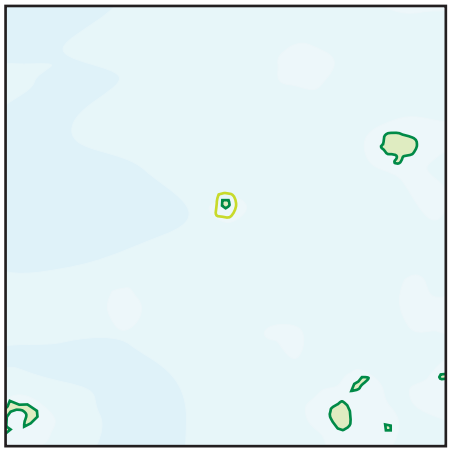
CF11-Naselai, Verata coastal region
Description of area: located on the southeast of Viti Levu with a wide range of habitats including seagrass areas, mangrove forests, mudflat shores.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown



CF12-Great Sea Reef
Description of area: 150km (length) barrier reef system located 10-35km offshore west of Vanua Levu.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: high (Grouper species)

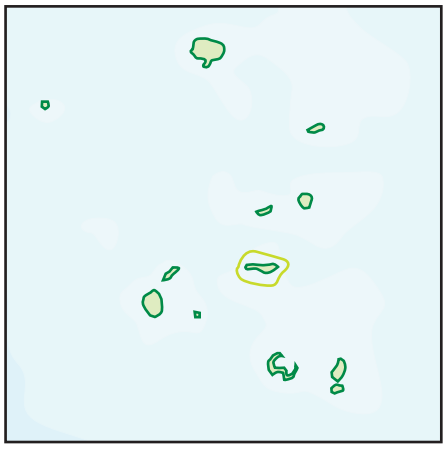


CF13-Oneata
Description of area: an oceanic atoll with an extensive barrier reef system
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown



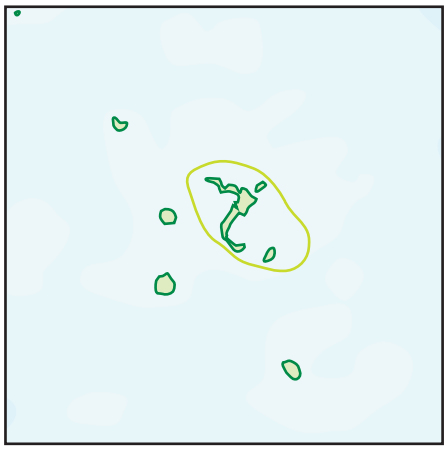
CF14-Vanuavatu, Central Lau, west of Lakeba
Description of area: small oceanic atoll.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown

CF15-Fulaga, Ogea Levu, Southern Lau, South of Lakeba
Description of area: raised limestone island with large protected atoll lagoons, oceanic barrier reefs and channels.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: moderate

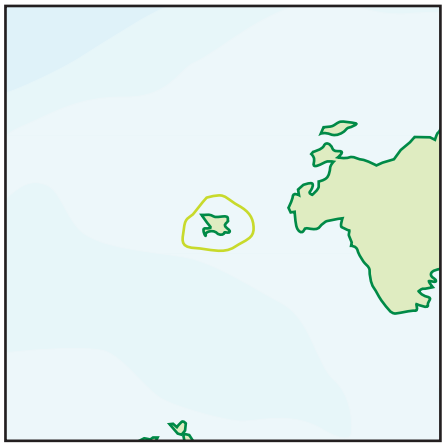


CF16-Namuka, Southern Lau, South of Lakeba
Description of area: oceanic reef atoll surrounded by deep waters
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown

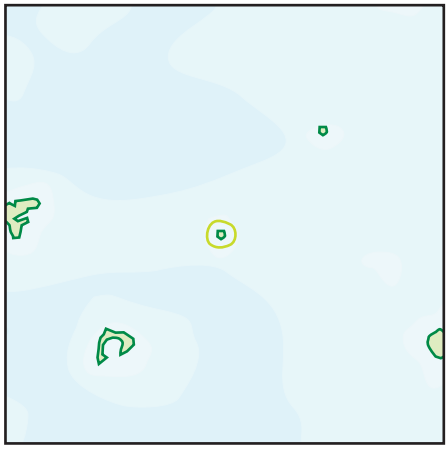
5.1.3 Coral reef fish



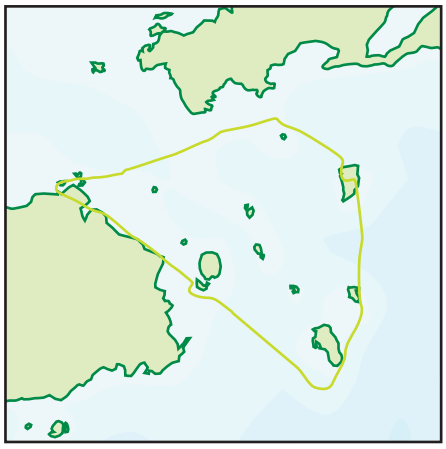
CF17-Vanuabalavu
Description of area: highest island in the Lau group with deep fjord-like bays in the lagoons.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: moderate



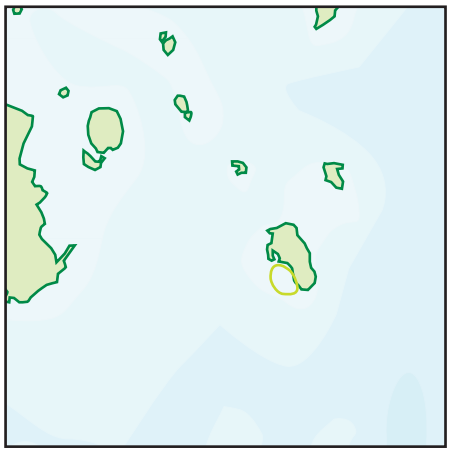
CF18-Yadua Island
Description of area: a small volcanic island, 16km off Bua Bay.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: low



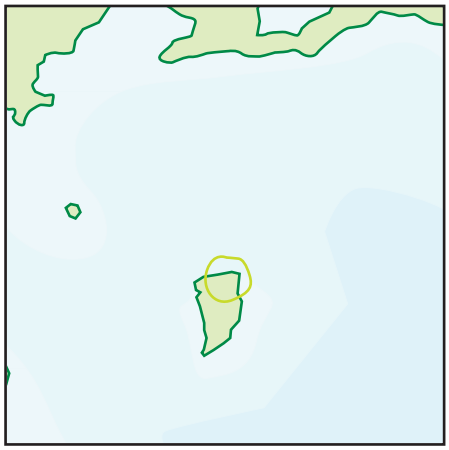
CF19-Navatu Reef-Open ocean reef North of Fulaga
Description of area: oceanic reef atoll
Known status of fish abundance and diversity: low
State of knowledge on fish aggregation: unknown



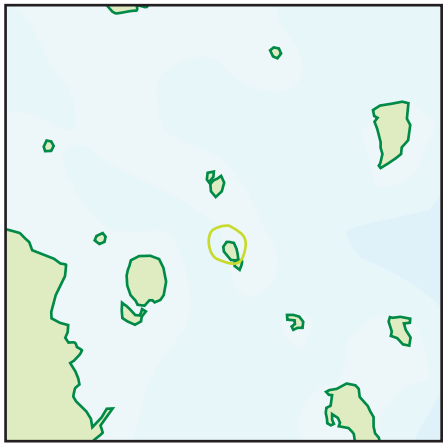
CF20-Bligh Triangle/Lomaiviti Triangle
Description of area: This includes the central reef complex-Rakiraki-Namena-Koro-Gau-Ovalau (Vatu-i-ra Passage)
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: moderate



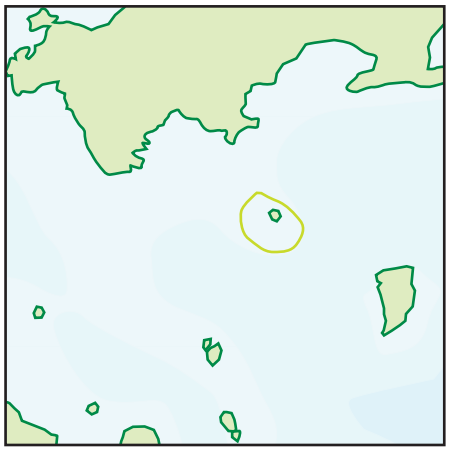
CF21-Naigali Passage,Gau
Description of area: a major pass that breaks the extensive Sawaieke barrier reef system and a popular shark and diving site.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown



CF22-Koro East Corner
Description of area: a fringing reef with deep drop-offs and a promontory.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: low (Trevally, barracuda, mackerel etc.)



CF23-Wakaya Reef
Description of area: a fringing and barrier reef system with channels and rubble beds.
Known status of fish abundance and diversity: unknown
State of knowledge on fish aggregation: unknown

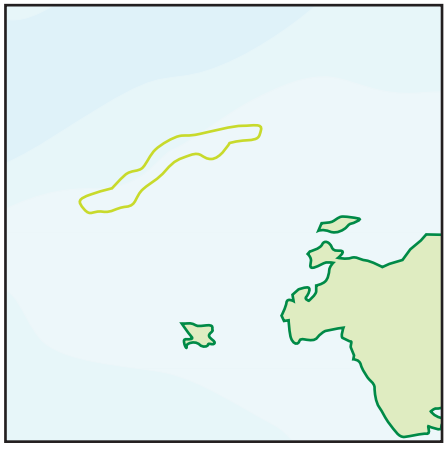


CF24-Namena Reef
Description of area: an intact barrier reef system with windward and leeward reefs affected by two different bodies of ocean.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: moderate (shark populations)

5.1.3 Coral reef fish

CF25-Vatuira Passage
Description of area: Located in Bligh waters west of Viti Levu.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: unknown

CF26-Somosomo Strait between Taveuni and Vanua Levu
Description of area: the channel lies on the east to southwest axis and is prone to cyclones during October-March.
Known status of fish abundance and diversity: low
State of knowledge on fish aggregation: low (shark population)



CF27-Great Sea Reef (of Yaquaga Island)
Description of area: a remote and extensive 150km long barrier reef which extends offshore 10-30km from the mainland of Vanua Levu.
Known status of fish abundance and diversity: moderate
State of knowledge on fish aggregation: moderate

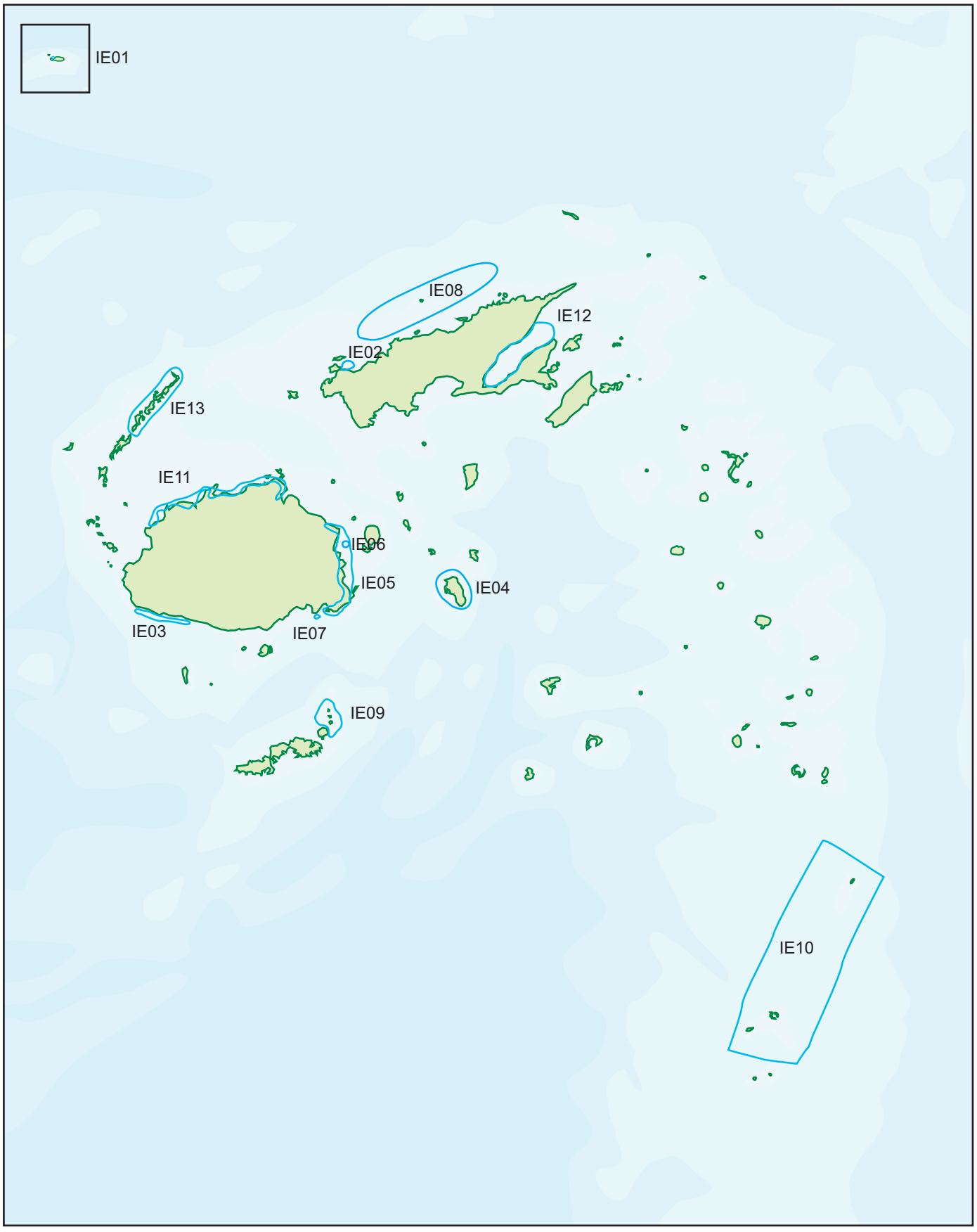
5.1.4 Inshore ecosystems

The inshore environment provides important feeding and breeding habitats. It is usually an area of high conservation, cultural, medicinal and economic importance. Inshore habitats include mudflats and soft bottom sedimentary environments, seaweed (*algae*), seagrass. Species associated with the inshore environment include white cowries (*Cypreaea spp*), emperor fish (*Lethrinus spp*.), kanace (*mullet*) (*Mugilidae*), nuqa (*rabbitfish*) (*Siganids*), seahorses (*Syngnathidae*), silver biddy (*gerridae*), ponyfish, seasnakes (*Laticauda spp*.), turtles species, seabirds, Venus clams (*Cyclena sinensis*), fiddler crabs (*Uca vocans*); mud crabs (also known as mangrove crabs) (*Scylla serrata, qari* in Fijian), mud lobsters (*Thalassina anomala, mana* in Fijian), sting rays (*Himantura spp*.), eels (*Order anguilliformes*), polychaete worms, small fish (*detritus feeders*), goatfish *(Mullidae*), pufferfish (*Tetradontidae*), and hammerhead sharks (*Sphyrna leweni*). Thirteen significant areas were identified by the group (Figure 5) as being representative, unique or areas that provide the feeding and breeding grounds for species of cultural, economic or conservation value.

A total of 13 areas of inshore ecosystems were identified by the participants (Map 4).

IE01 Maka Bay, Rotuma **IE02** Bai-ni-vualiku-Nakalou, Macuata **IE03** Coral Coast **IE04** Vanuaso, Gau **IE05** Rewa & Tailevu mudflats **IE06** Mabualau Island **IE07** Nasese **IE08** Great Sea Reef **IE09** Great Astrolabe Reef **IE10** Ono I Lau and Vatoa **IE11** west Viti Levu **IE12** Natewa Bay **IE13** Yasawa Group

Map 4: Inshore ecosystems



5.1.5 Open ocean and pelagic ecosystems

The major elements in this Open Ocean group include migratory routes, spawning and breeding grounds for species such as :

- Tuna such as bigeye (*Thunnus obesus*), Skipjack (*Katsuwonus pelamis*), Albacore (southern) (*Thunnus Alalunga*), Southern bluefin (*Thunnus maccoyii*).

- Billfish such as blue marlin (*Makaira nigricans*), black marlin (*Istiompax indicus*), striped marlin (*Makaira audax*), spearfish (*Tetrapturus bevirostris*), sailfish (*Istiophorus gladius*), swordfish (*Xyphias gladius*).

- Elasmobranchs such as the sting ray (*Himantura spp.*), whaleshark (*Rhinochodon typus*), blue shark (*Prionace glauca*), oceanic white tip shark (*carcharhinus longimanus*), mako shark (longfin & shortfin)(*Isurus glaucus*), thresher shark (bigeye & small eye) (*Alopias vulpinus*), black tip reef (*Carcharhinus melanopterus*), silvertip (*Carcharhinus albimarginatus*), 6-gill shark (*Hexanchus griseus*), crocodile shark (*Pseudocarcharias kamoharai*), tiger shark (*Galeocerdo cuvieri*) and hammerhead shark (*Sphyrna leweni*).

- Deep water snappers such as the long tail snapper (onaga) (*Etelis coruscans*), ribbon tail snapper (*Taenyura lymma*), jobfish (*Aphareus spp.*), Bedford snapper (*Paracaesio kusakarii*), stone snapper (*Paracaesio stonei*), long tail snapper (*Etelis coruscans*).

- Cetaceans such as the sperm whale (*Physeter catodon*), the humpback whale (*Megaptera novaeangliae*), dwarf minke (*Balaenoptera acutorostrata*), pilot (*Globicephala melaena*) and dolphin species (*babale in Fijian*) such as long beaked (*Delphinius capensis*) and short beaked dolphins (*D. delphis*),

- Marine Turtles such as the hawksbill (*Eremochelys imbricata*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*)

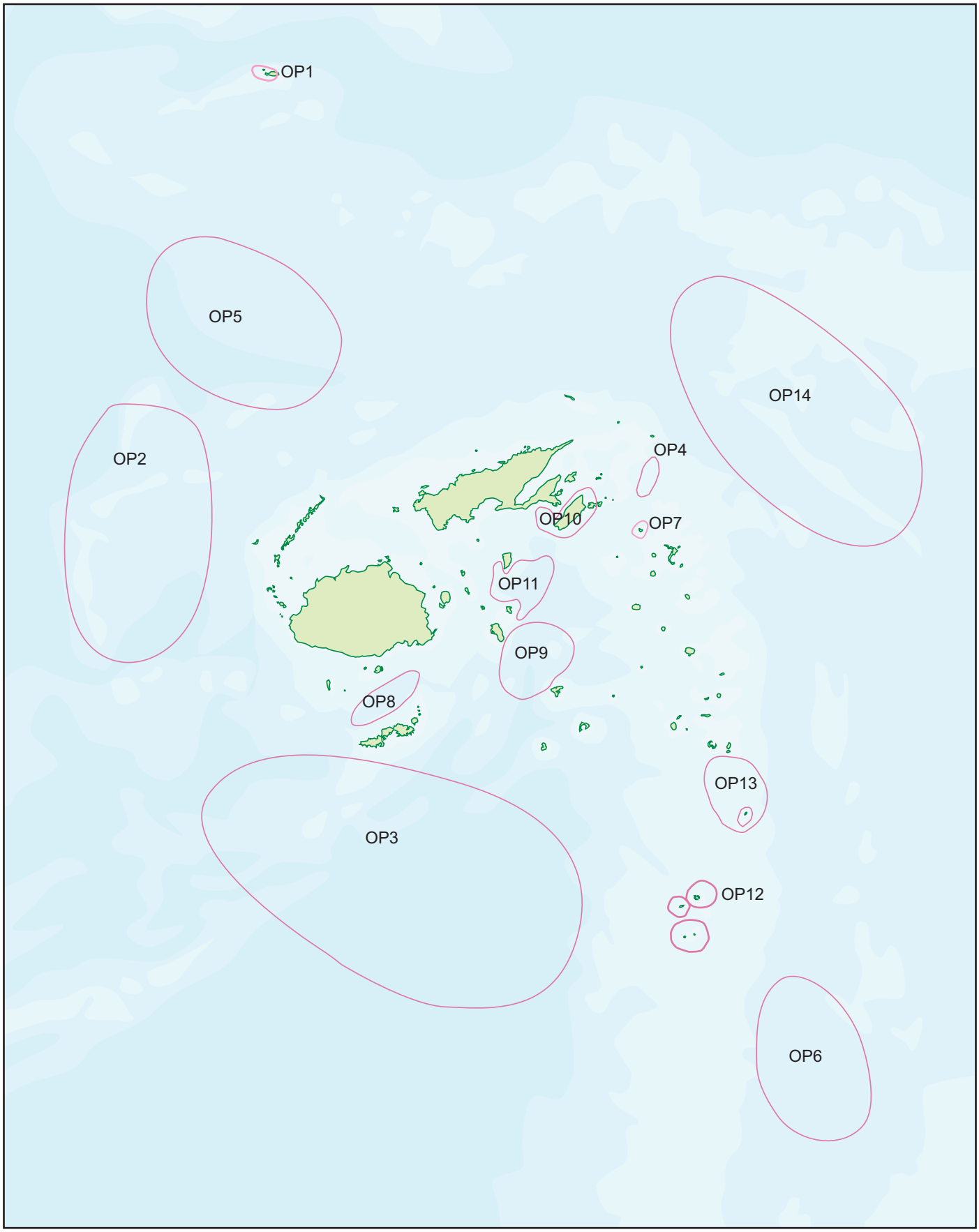
- Crustaceans/molluscs such as shrimps (*Decapods*), spider crab (Families: *Majidae* and *Hymenosomatidae*), nautilus (*Nautilus macromphalus*), squid (*Teuthoidea*).

- Other species identified by participants included: Barracudas (*Sphyraenidae spp.*), wahu (*Acanthocybim solandri*), Mahimahi (dolphinfish) (*Coryphaena hippurus*), sunfish (family *Molidae*), Moonfish(*Monodactylus argeneus*), Flying fish (*Cypselurussimus*), Mackerel (*Scombridae*) and Rainbow runner (*Elegatis bipinnulata*).

A total of 14 areas significant for offshore fisheries were identified by the participants, mainly fisheries experts (Map 5). The decisions were mostly based on commercial fisheries catch information.

OP1 NNW Rotuma **OP02** West of Yasawa **OP03** South Kadavu **OP04** East of Qelelevu lagoon **OP05** NNW Yasawa **OP06** South of Fiji EEZ **OP07** off Adolfuss Reef, Wailagilala **OP08** Beqa Barrier Reef-Kadavu **OP09** Gau-Moala **OP10** Taveuni, Somosomo Strait **OP11** Koro-Nairai **OP12** Duff Reef **OP13** Ogea **OP14** SE Minerva Reef

Map 5: Open ocean and pelagic ecosystems



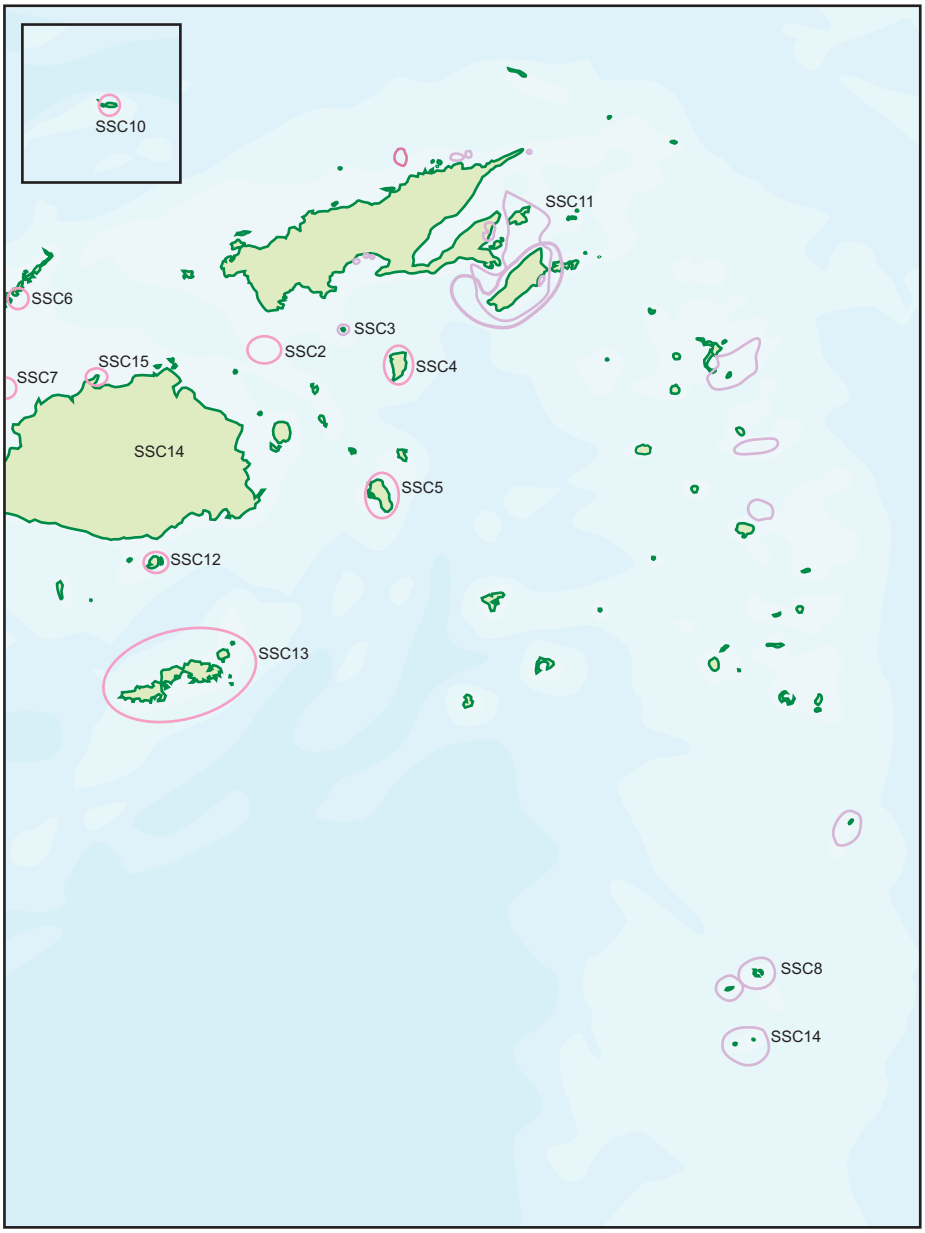
5.1.6 Species of special concern

Species of special concern include those species which are vulnerable or endangered, endemic, contribute to regional or global conservation, charismatic, or are indicators of ocean health. In some cases, cultural significance was also a determinant for significance. The species that fell into this category were considered to be tuna, dolphins, whales, turtles, triton shell (*Charonia tritonis*), giant clam (*Tridacna tritonis*), bumphead parrotfish (*Bulbometopon muricatum*), whale shark (*Rhinochodon typus*), sharks, rock cod (*Epinphelus spp.*), groupers (*Cephalopolis spp.*), Beche-de-mer (*Holothuridae*), Fiji petrel, Balolo (*Eumice viritis*) and coconut crabs (*Birgus latro*).

A total of 15 sites were identified as important in terms of providing feeding and breeding habitats, or as migratory routes for species that are of conservation interest in Fiji (Map 6).

SSC1 Vatu-i-ra Passage **SSC2** Bligh water **SSC3** Namena Barrier Reef **SSC4** Koro **SSC5** Gau Island **SSC6** Western Yasawa **SSC7** Tavarua **SSC8** Southern Lau **SSC9** Lau-Cikobia **SSC10** Southern Rotuma **SSC11** Somosomo Strait **SSC12** Beqa **SSC13** Great Astrolabe Reef, Kadavu **SSC14** Ono-i-Lau **SSC15** Ba.

Map 6: Species of special concern

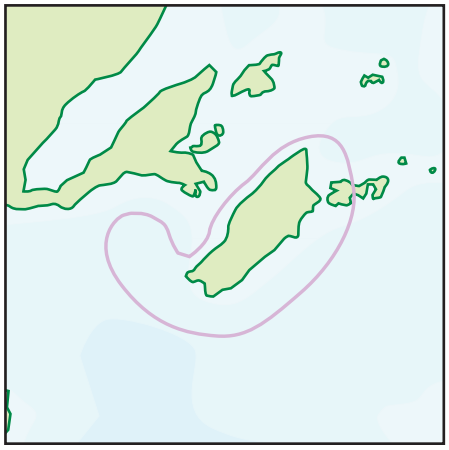


5.1.7 Community knowledge about habitat and species

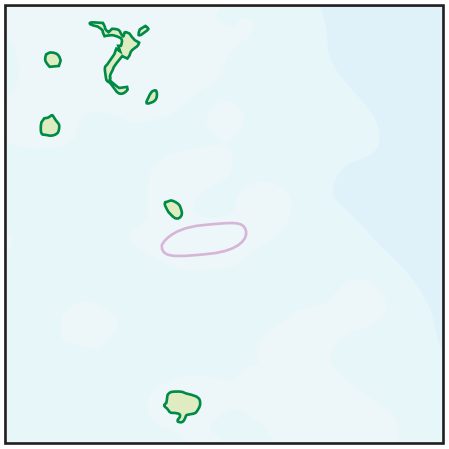
This traditional knowledge group looked at identifying areas rich in species that are considered to be culturally and economically significant for FIME communities. This also added valuable historical knowledge regarding the distribution of species. The areas covered were mainly Lau and Cakaulevu region.

Twenty priority areas were identified which included important sites for dolphin, marlin (Family *istiophoridae*), lobster, seabirds, giant clams (*Tridacna tevoroa*), seagrapes, oysters, kaka, turtles, sharks, sea grass, shell fish and sea weeds, mullet (*Mugilidae*) and balolo (*Eumice viritis*), rabbit fish (Family *Siganidae*), sea worms, kawago, saqa, trevally (*Carangidae*), emperor species (*Lethrinus*), rock cod (*Epinephelus*), and wahu (*Acanthocybium solandri*).

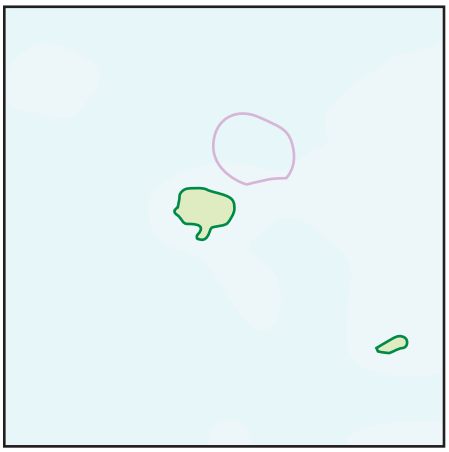
Some of the areas that were selected overlapped with the scientific groups data, confirming some of the information. This included agreement on the presence of seagrass in Maka Bay, seagrass and unicorn fish for Natewa Bay, the presence of turtles in Namenalala, giant clams in Ono I Lau and Vatoa and turtles in Hatana. Other areas complimented the scientific layers by providing further details on species or locations. For example, the group members reported that the area 40 km south of Savusavu is an important breeding ground for turtles, though rarely found these days. The Netaqali area in Gau has been noted for high fishing activity, both night and day, thus there has been a decline in fish stocks and diversity in this area.



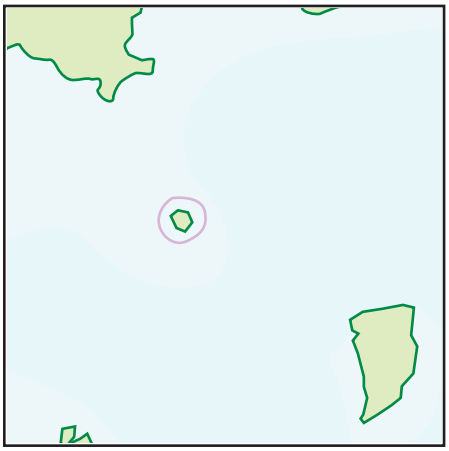
CG01-Sele sele, Taveuni
Level of community knowledge: low
Knowledge of marine species diversity: none
Habitat diversity: unknown
Special features: none



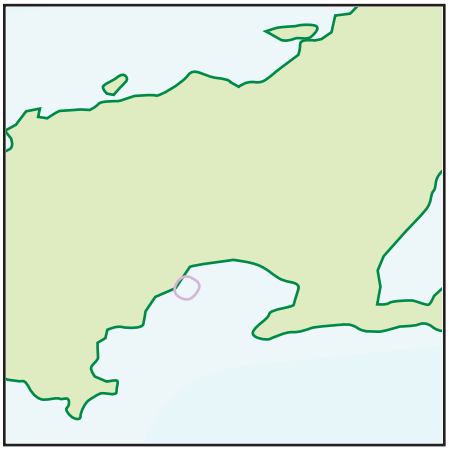
CG02-Tuvuca,Lau
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: none



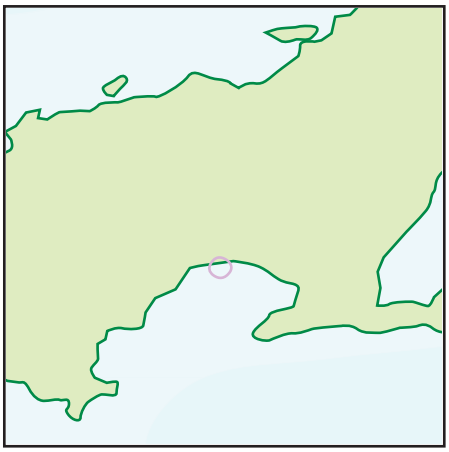
CG03- part of Lakeba, outside Napotu Reef
Level of community knowledge: none
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: common sightings for pods of dolphins



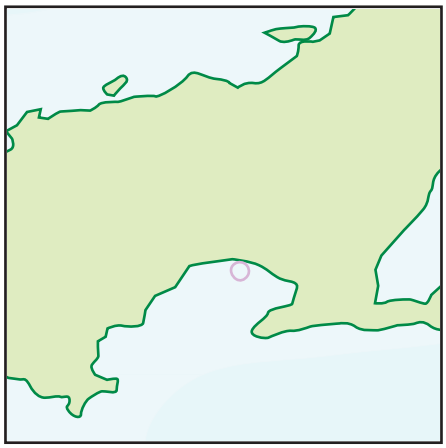
CG04-Namena Island
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: known
Special features: mangroves



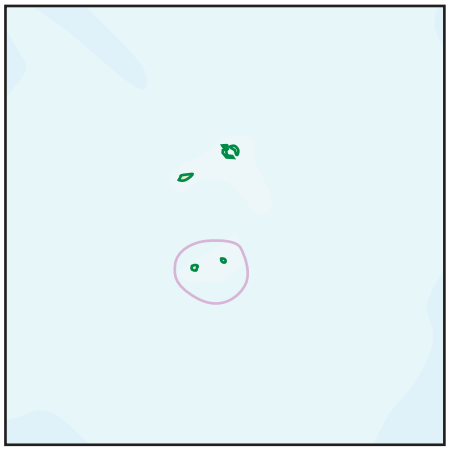
CG05-Cakau ni Qio, Wailevu Tikina
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: known (low)
Special features: seagrass meadows



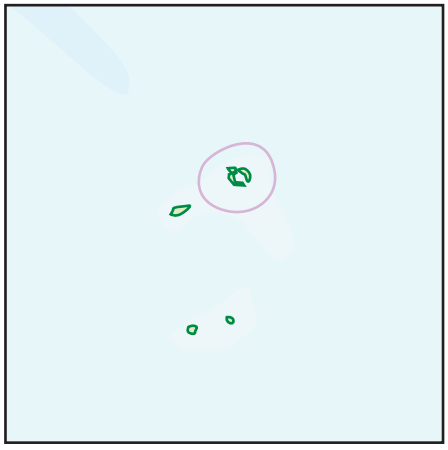
CG06-Natuvu village
Level of community knowledge: low
Knowledge of marine species diversity: moderate
Habitat diversity: known
Special features: where the river drains from Mount Kasi



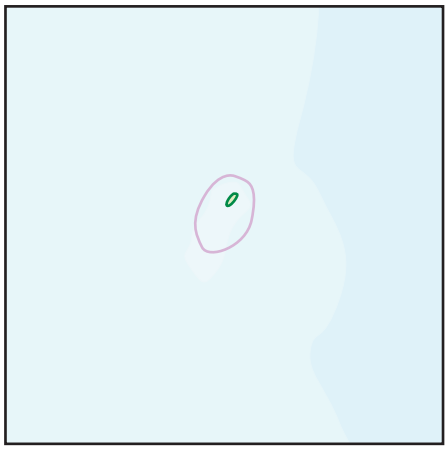
CG07-Natuvu (Wailevu, Cakaudrove)
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: oyster farm established



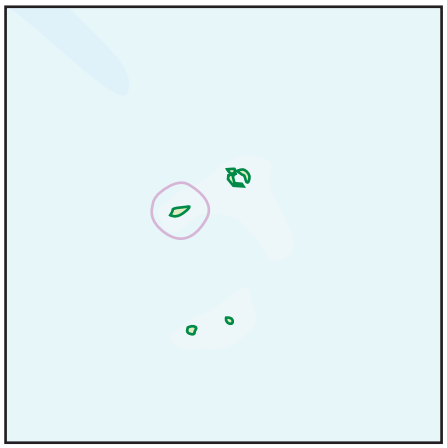
CG08-Tuvana-i-Ra and Tuvana-i-Colo, Ono-i-Lau
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: intact offshore coral islands



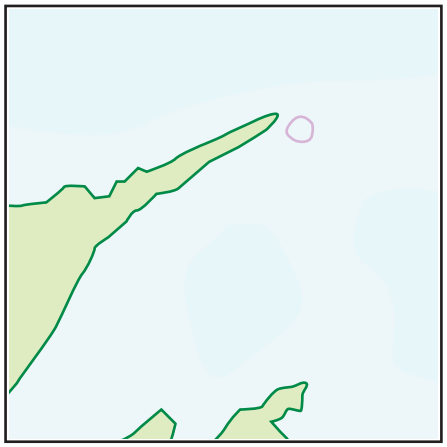
CG09-Udui Island/Yanuya Island, Ono-i-Lau
Level of community knowledge: low
Knowledge of marine species diversity: unknown
Habitat diversity: unknown
Special features: abundance in varieties of shelfish and seaweed (Udui); seabird colony; endemic gecko habitat (Yanuya).



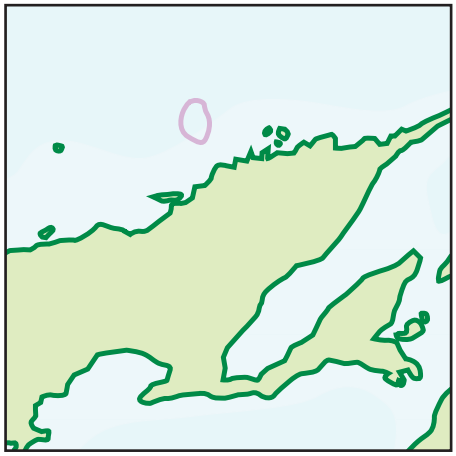
CG10-Viata, Vatoa, Ono & Vuata Vatoa
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: giant clam Tridacna species commonly found



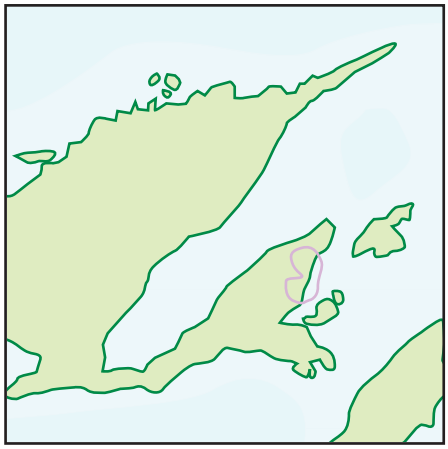
CG11-Ono-i-Lau
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: submerged reef



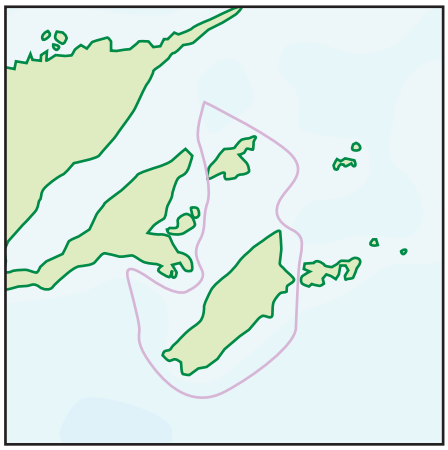
CG12-Udu Point, Macuata
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: known
Special features: seagass beds



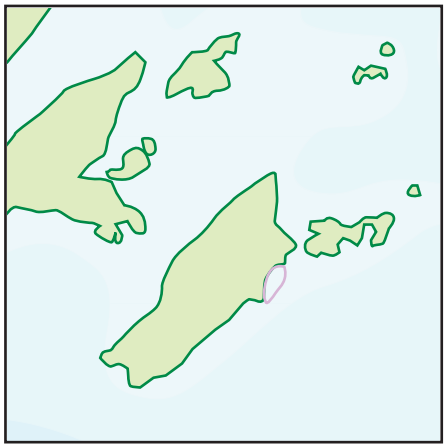
CG13-Navutu (Tikina Province)
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: oyster farm established



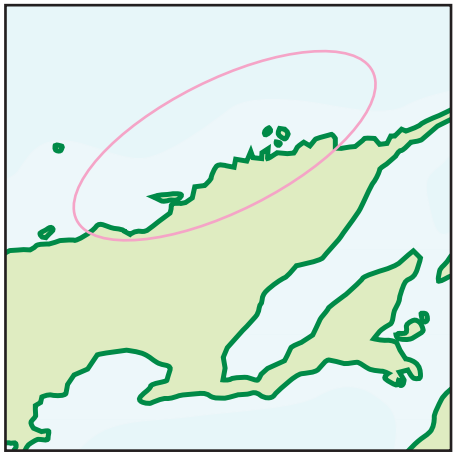
CG14-east side of Buca Bay, Cakaudrove
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: oyster farm established



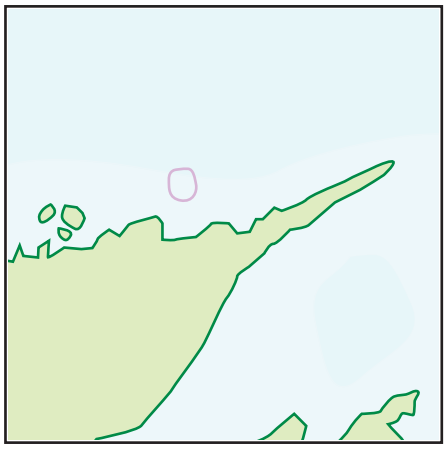
CG15-east side of Buca Bay, including Rabi and Taveuni including Somosomo Strait, Cakaudrove.
Level of community knowledge: none
Knowledge of marine species diversity: low
Habitat diversity: known
Special features: sightings of whales and dolphins



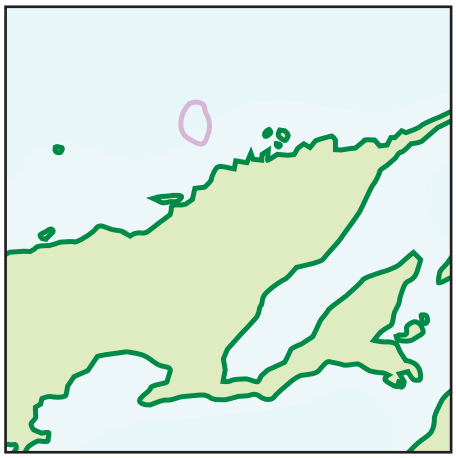
CG16-Bouma coast, Taveuni
Level of community knowledge: none
Knowledge of marine species diversity: low
Habitat diversity: known
Special features: Balolo



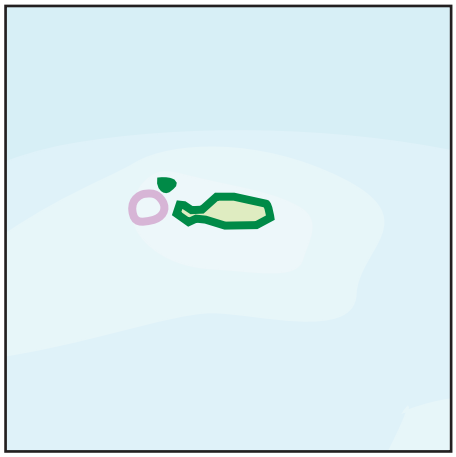
CG17-Cakau Levu Bay, Macuata
Level of community knowledge: low
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: a passage in the Cakau Levu bay to the Udu end of Cakau Levu and acts as an exit point to oceanic currents.



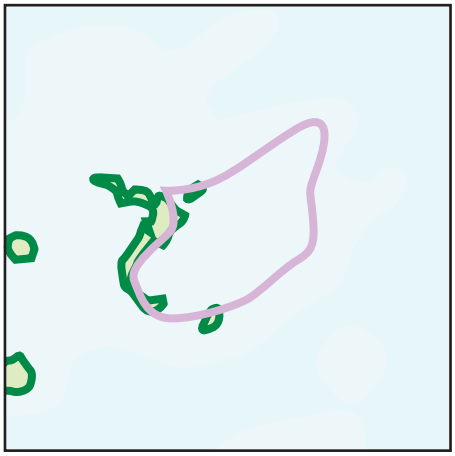
CG18-Cakau Levu Reef, Macuata
Level of community knowledge: moderate
Knowledge of marine species diversity: moderate
Habitat diversity: unknown
Special features: third longest barrier reef system in the world.



CG19-Nuyukaro Passage, Macuata
Level of community knowledge: moderate
Knowledge of marine species diversity: low
Habitat diversity: unknown
Special features: passage on Cakau Levu reef towards Labasa town centre, a known shark foraging area..



CG20-Rotuma
Level of community knowledge: moderate
Knowledge of marine species diversity: moderate
Habitat diversity: known
Special features: commercially important blue coral Heliopora is commonly found.



CG21-Toba o Lomaloma, Vanuabalavu, Lau
Level of community knowledge: low
Knowledge of marine species diversity: unknown
Habitat diversity: unknown
Special features: isolated patch reefs.

5.2 Priorities Conservation Areas

A total of 35 Priority Conservation Areas (PCAs) were identified based on individual group discussion and further refinement during plenary discussions. These 35 areas capture the full range of marine biodiversity, species, and communities that makes FIME unique and that if conserved will assure that the health and integrity of Fiji's marine environment are maintained

Five areas were ranked to be globally important. Criteria for selection of areas of global importance were: uniqueness, endemism and high levels of diversity. For example, the Lomaiviti Triangle has a channel very unique in the South Pacific which supports intact and diverse species and habitats. The blue coral Heliopora is limited in its distribution in the FIME area and is concentrated in Rotuma and is associated with high endemism and uniqueness. Areas were also ramked according to their importance for critical stages in the life cycle of threatened species. Gau in the Lomaiviti triangle, is an important breeding area for humpback whales and Namenalala is thought to be the last remaining nesting area in Fiji for hawksbill turtles. Although some ecoregionally and sub-regionally important areas share some of these features, in general, global sites have a more diverse range of significant attributes.

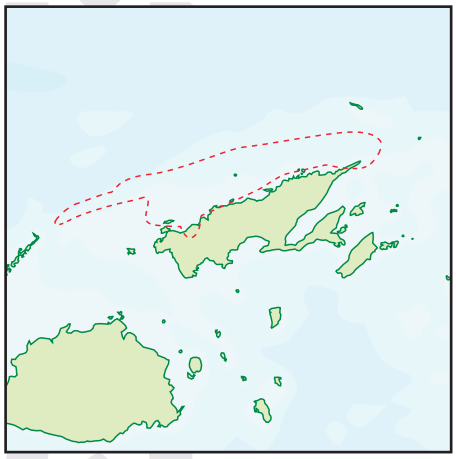
Areas of ecoregional significance were based on attributes such as, natural migratory path of offshore fishery species such as tunas; the vulnerability and over-exploitation of species; the importance of species in terms of biodiversity and temporal spatial movements that may be important to entire systems, such as upwelling areas, feeding zones (e.g. big eye tuna in the southeastern part of the country), aggregation areas (once again the south area and sailfish areas in east of Fiji), and areas for marine mammals.

Fifteen PCAs were identified to be of national importance (mainly national fisheries areas) and 15 areas of sub-regional importance. Of these, 4 national and 1 sub-regional area will need further research to confirm their ranking. Final priorities by sub-region include 12 areas identified within the Mamanuca-Astrolabe Subregion, 10 areas in Cakaulevu, five areas in Bligh Waters, five areas in the Lau Group and three areas in Rotuma.

There was considerable debate on the status of some of the areas. As a result some were upgraded in the final analysis. For example most of the offshore fisheries areas were ranked sub-regionally significant but the majority agreed that they should be upgraded. The debate on ranking of the Ba Delta was centred on whether it should be of national or sub-regional significance. Due to a lack of information, it was agreed that it be ranked nationally important as it is a representative area in terms of mangrove type and productivity for fisheries. However, its national status needs to be confirmed through further research. The debate concerning the offshore area south of Kadavu, centred on whether it was of sub-regional or of national importance. It was assigned national importance because of its fisheries stocks.

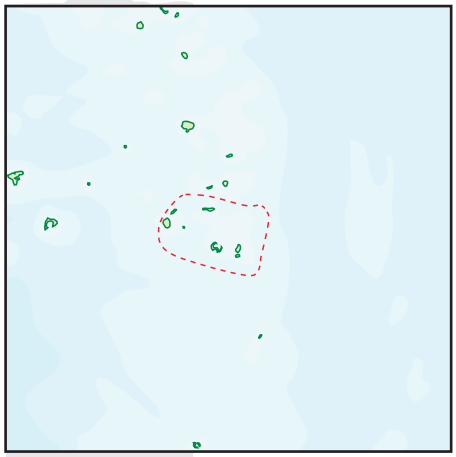
The most debated area was the Great Sea Reef, known locally as Cakaulevu, and whether it is of global or regional importance either represented by smaller polygons covering the entire area or one large polygon. Although there were huge information gaps, the majority of the participants felt that its relative uniqueness globally in terms of size, complexity, unique diversity and exceptional level of endemism merited it to be ranked as globally significance.

Global Importance



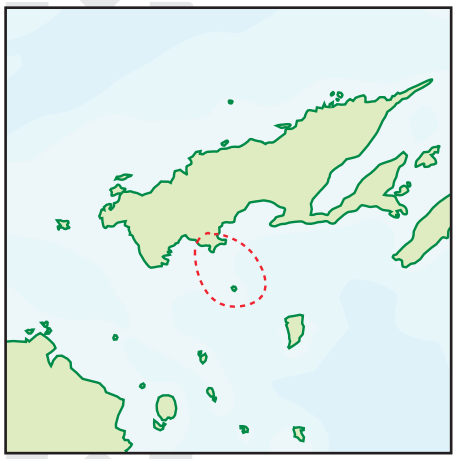
Great Sea Reef, Macuata

Description of area: 3rd longest barrier reef system in the world with intact systems of lagoons, channels, mangroves and seagrass habitats.
State of information: Information on species and habitat diversity was obtained mainly from the community group. Scientific information was lacking, but has been updated as a result of the WWF led Great Sea Reef biological survey in 2004.



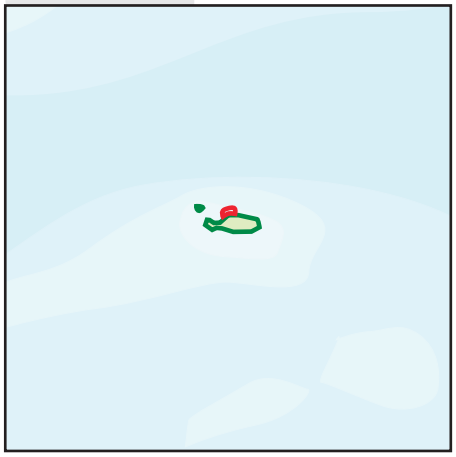
Southern Lau

Description of area: a region of isolated limestone and oceanic atoll islands with a range of habitats including seagrass, oceanic patch reefs and extensive barrier reef systems.
State of information: A wide range of information on species and habitat diversity based on past studies. Specific species diversity information was limited.



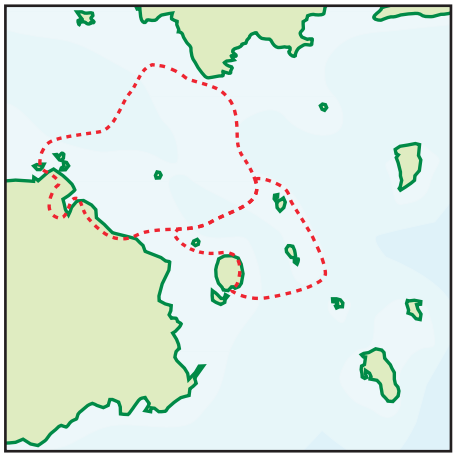
Namenalala

Description of area: a marine protected area located at a barrier reef system influenced by two oceanic parts. Oceanic route for open ocean species (whales, turtles, dolphins).
State of information: Broad habitat description and information on species diversity was focused on larger fauna, open ocean species (like whales).



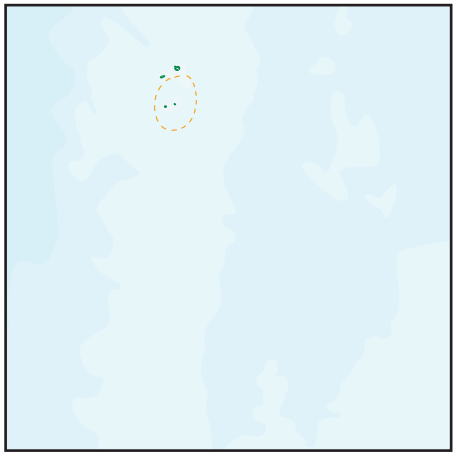
Rotuma

Description of area: an isolated volcanic island west of the main Fiji group. Geographical and oceanic conditions creates a distinct range of habitats and species composition.
State of information: habitat diversity information was detailed. Information on species was broad and descriptive.



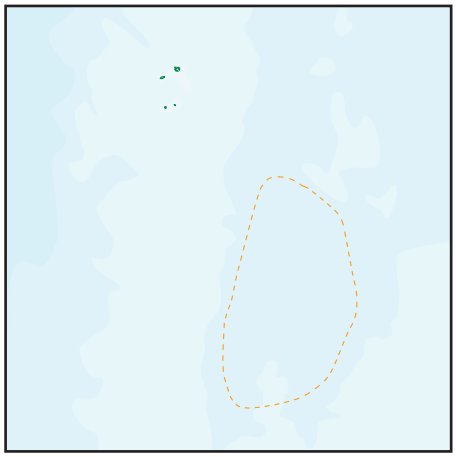
Lomaiviti Triangle- Vatuira Channel-Ovalau-Makogai-Wakaya Channel
Description of area: a region of deep waters with high coral and fish diversity. A known whale breeding and migratory route.
State of information: Species diversity information on coral and fish was specific. Historical events such as the bleaching and cyclones were detailed in its impact to the area.

National Importance



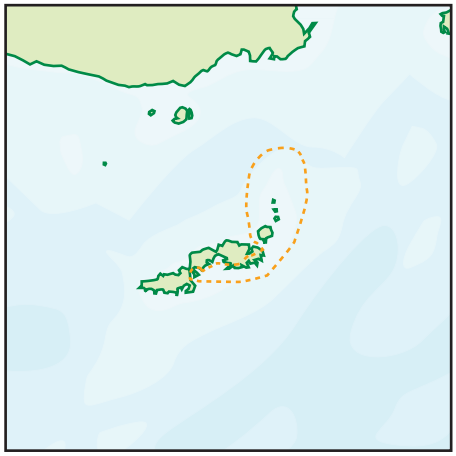
Southern Lau

Description of area: a region of isolated limestone and oceanic atoll islands.
Biological attributes: The oceanic conditions associated with the Lau Group provides a distinct range of habitats and species composition.
State of information: A wide range of information on species and habitat diversity were based on past studies. Specific species diversity information was limited.



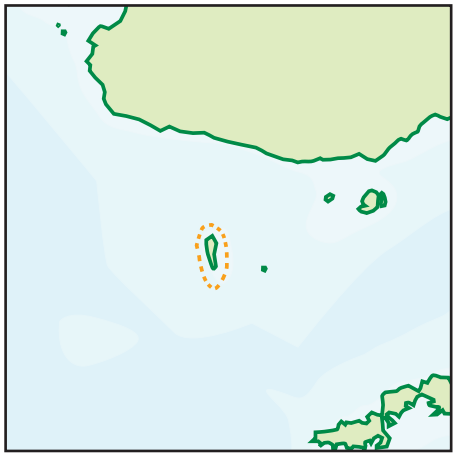
SE off Minerva Reef

Description of area: an isolated reef fringed on the farther southern boundaries of Fiji's EEZ.
Biological attributes: Oceanic conditions associated with upwelling areas is a crossroad for migratory open ocean species and aggregation for feeding and breeding site for offshore fisheries.
State of information: Broad reference to macrofauna likely to be found in such an area. Limited information on the area's biodiversity.



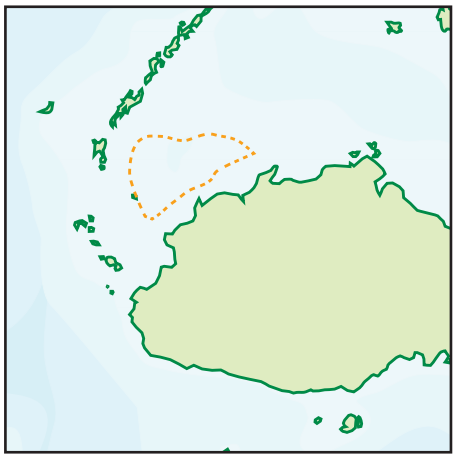
Kadavu

Description of area: Kadavu host the Great Astrolabe Reef.
Biological attributes: A nutrient rich area provides spawning and aggregation conditions for both inshore and offshore fisheries.
State of information: Broad descriptions of habitat and species diversity. Many studies have been conducted at the Great Astrolabe Reef.



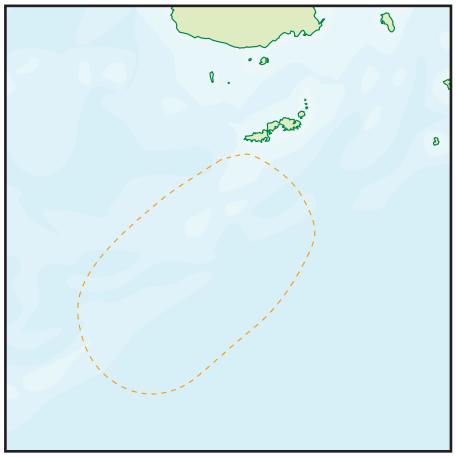
Vatulele

Description of area: The island has brackish tidal pools, habitat for the red prawns Arteseomorpha foliacea.
Biological attributes: known nesting site for turtles and the white tailed Tropic seabird *Phaethon lepturus*.
State of information: Very limited information.



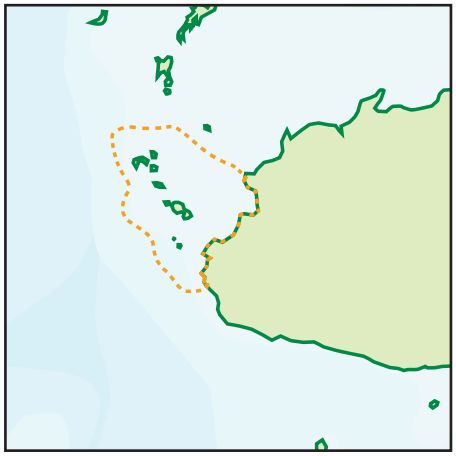
Off Yasawas

Description of area: One of the largest seamount in the Fiji Basin.
Biological attributes: Conditions associated with such a high productivity allows for aggregation of pelagic species such as tuna, sharks.
State of information: Limited information.



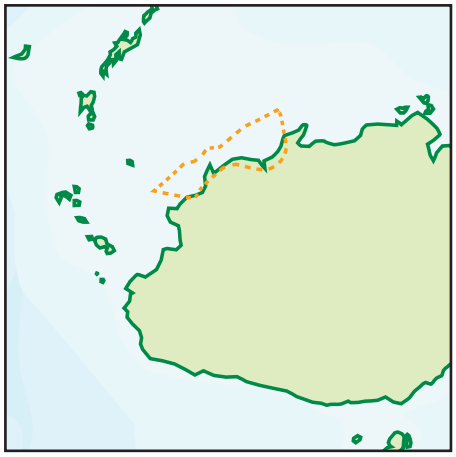
Fiji Basin Seamount

Description of area: A seamount in the Fiji Basin.
Biological attributes: Biophysical conditions and upwelling causes pelagic species to aggregate.
State of information: Broad descriptions provided. Limited information.



Nadi-Mamanuca Bay

Description of area: extensive fringing reef systems.
Biological attributes: Associated conditions with the group of islands provide habitat for nesting turtles and its dry coastal vegetation supports a distinct assemblage of birds and other fauna.
State of information: Broad description on species and habitat diversity. Limited information.

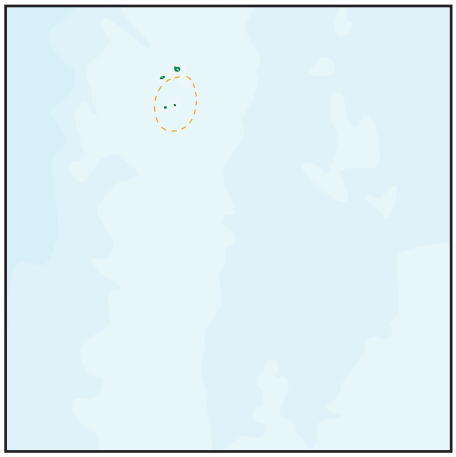


Ba Delta and Patch Reefs

Description of area: extensive mangrove systems.
Biological attributes: Associated conditions support productive fisheries.
State of information: Broad descriptions of habitat. Very limited information.

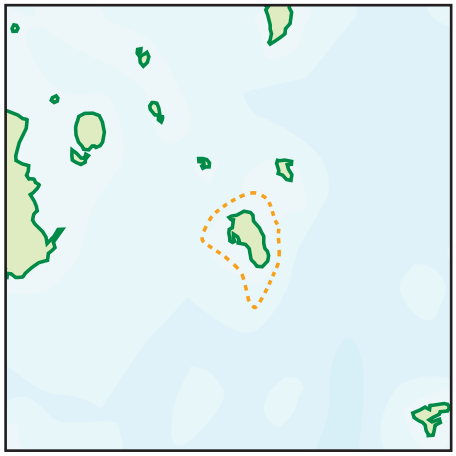
Beqa

Description of area: a historically biodiversity rich and popular dive site.
Biological attributes: Shallow coral heads in current flushed lagoons.
State of information: Lack of specific information describing biodiversity.



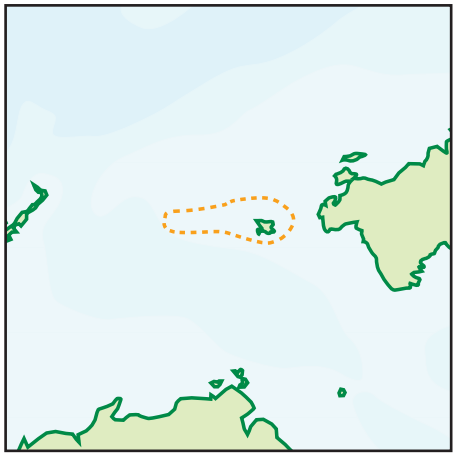
Mabualau

Description of area: seabird nesting area.
Biological attributes: sea snakes hibernation and nesting area.
State of information: Very limited information.



Gau

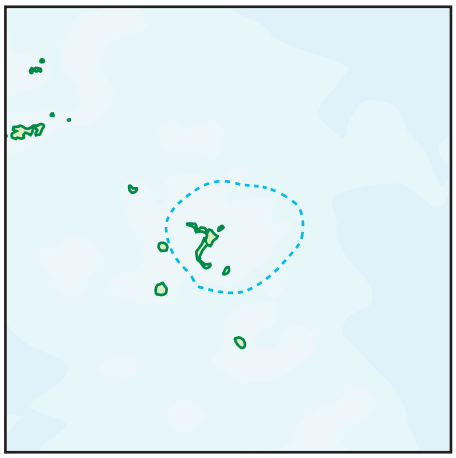
Description of area: An extremely deep lagoon bound by an extensive barrier reef on the windward side of island.
Biological attributes: important nesting site for seabirds and turtles.
State of information: Limited information on species and habitat diversity.



Yadua Island and passage reefs

Description of area: a known resilient site to coral bleaching.
Biological attributes: Oceanic conditions associated with high coral cover and diversity. Habitat of the endemic crested iguana Brachylophus vitiensis.
State of information: Species specific information such as the abundance of commercially and ecologically important bumphead parrotfish Bulbometopan muricatum.

Sub-regional Importance

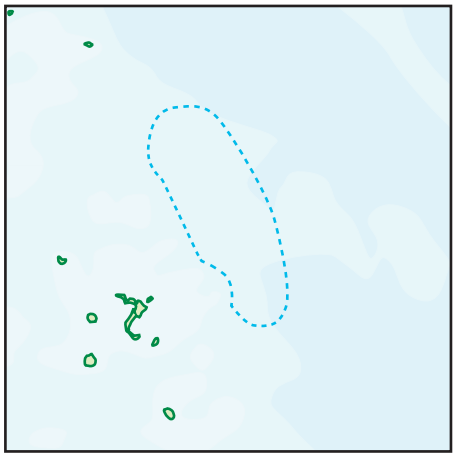


Vanuabalavu, Lau

Description of area: large variable stretch of barrier reef with offshore pinnacles and promontories.

Biological attributes: Spawning aggregations for grouper and coral trout species, high giant clam and lobster populations.

State of information: Broad species description (except for common fish species) and detailed habitat diversity.

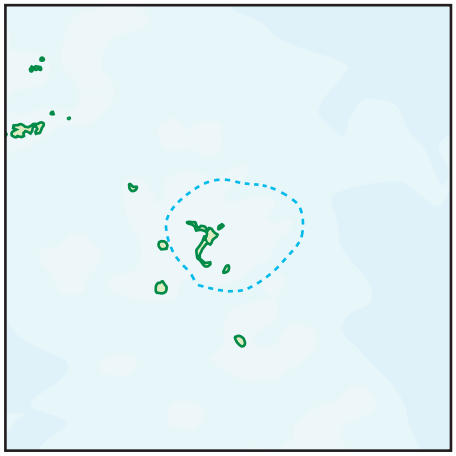


NE of Duff Reef

Description of area: seamount area

Biological attributes: spawning aggregation for big eye tuna and deepwater snapper (*Lutjanus sp*.).

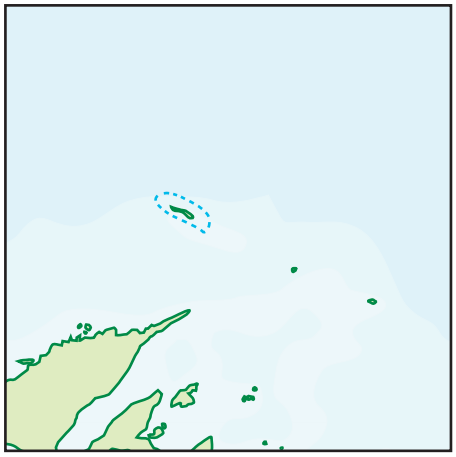
State of information: Very limited information.



Outer atolls

Description of area: upwelling area.

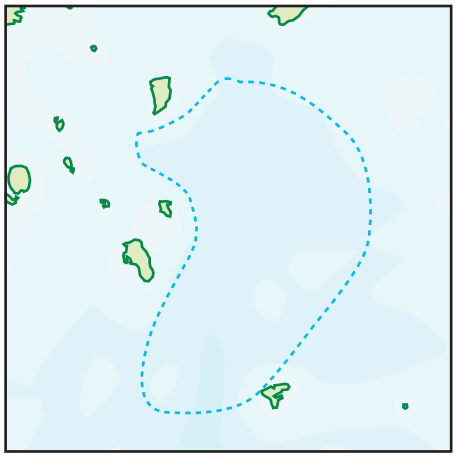
Biological attributes: Important site for feeding, breeding for billfish, sailfish, swordfish and marlin.



Cikobia Island, Macuata

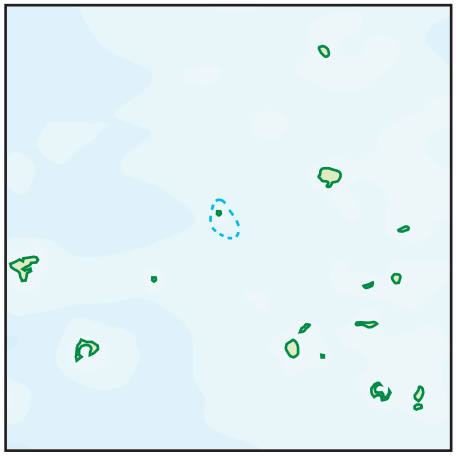
Description of area: isolated volcanic island.

Biological attributes: dolphin and whale migratory route. Turtle nesting and feeding area. High coconut crab population.

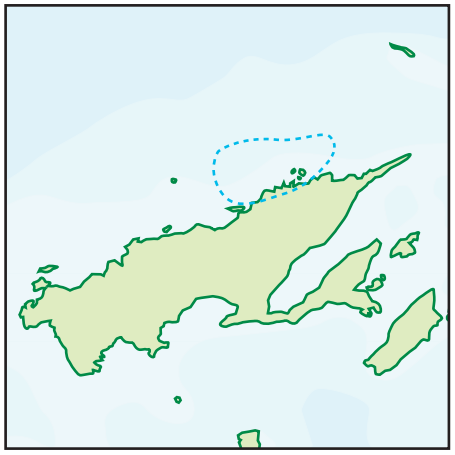


Koro Sea pelagic, Lomaiviti
Description of area: seamount and a barrier reef.
Biological attributes: known spawning sites for tuna and a whale migration path.
State of information: Very limited information.

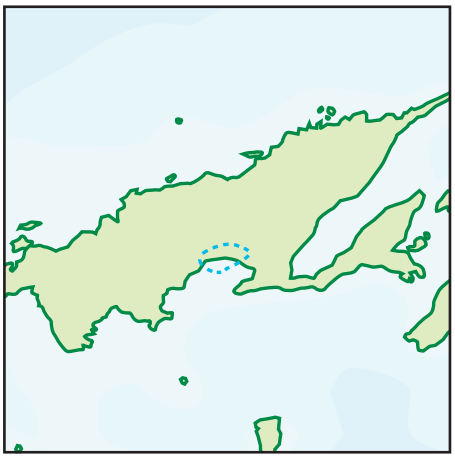
Kadavu Plateau
Description of area: seamount on southern tip of the island.
Biological attributes: The conditions associated with the area's dynamics provide important upwelling areas for major fisheries.
State of information: Limited information provided.



Vanuavatu Island, Lau
Description of area: Limestone island with phosphate deposits.
Biological attributes: high fish diversity and biomass, rich epifauna.
State of information: Species information provided.



Udu-Nakusa, Macuata
Description of area: Diverse habitat range
Biological attributes: sandflats, mangrove, seagrass and coral reefs.
State of information: Limited information.

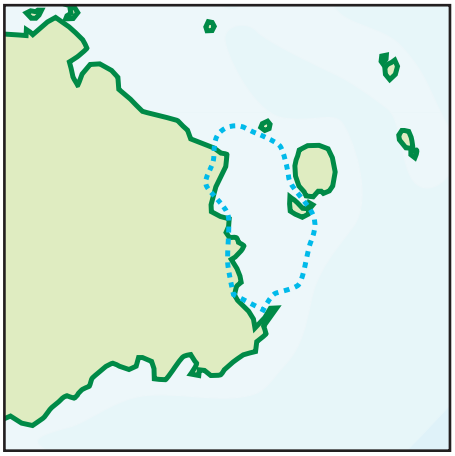


Savusavu Bay, Vanua Levu

Description of area: Fiji's largest inland salt lake connected to ocean by river. Scattered reefs with areas of seagrass and mangroves.
Biological attributes: Oyster beds in the area.
State of information: Limited information provided.

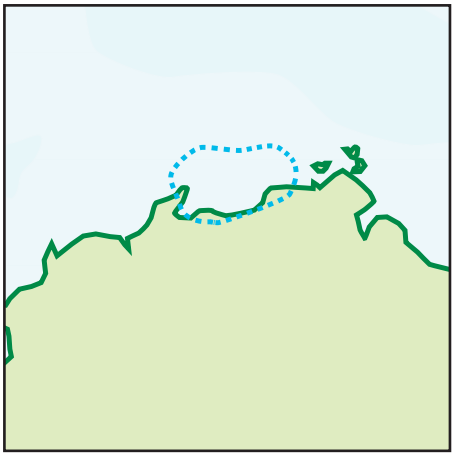
Bua Mangroves and Associated Reefs, Vanua Levu

Description of area: Network of nearshore reefs and intact mangrove systems.
Biological attributes: source sites for breeding and nursery for much of Bligh waters, Vatu-i-ra.



Rewa Delta, Vitu Levu

Description of area: Diverse and representative area of mangroves and mudflat systems.
Biological attributes: high diversity of estuarine and freshwater fish species, important brackish freshwater system.



Yaqara Reef Complex, Ra

Description of area: Distinct range of barrier and patch reefs with extensive mangrove systems.
Biological attributes: high soft and hard coral diversity.
State of information: Very limited information.

Southern Yasawa, Ba

Description of area: Extensive coral reef system with underwater caves.
Biological attributes: seagrass beds and a known turtle breeding ground. Resident dolphin population.
State of information: Very limited information.

5.3 Agreeing a vision statement for FIME

During the workshop, a vision for marine biodiversity was initiated by stakeholders to guide decision makers, conservation practitioners and key stakeholders in the design and implementation of future efforts to conserve marine biodiversity across Fiji. A collation of the dreams and visions of school children from Macuata and further inputs and comments from selected stakeholders led to the vision statement below.

These draft vision statements aims to incorporate the needs and desires of local people who depend on the marine resources for a livelihood; provide a feel for what biodiversity will prevail; and a sense of interaction between people and nature.

Draft Vision for the Fiji Islands Marine Ecoregion

An ecoregion with healthy, lush mangroves, coastal forests, seagrass beds, pollution free waters, trash free beaches, and where one sees sharks on every dive, manta rays, turtles, whales and dolphins, abundance of fish , and groupers big enough to feed a large family, beautiful coral reefs teeming with life, and where one is able to harvest from the sea leaving enough for their children's children – and their children's children.

An ecoregion with a stable social and economic environment where communities understand and have control of their natural resources, possesses the knowledge that these resources will be the life line for future generation, and where scientific knowledge and traditional knowledge meet to provide a learning environment that ensures the sustainable use of the marine resources to maintain the health of the lagoon, reefs and mangroves

An ecoregion whose leaders understand the importance of biodiversity conservation, and where knowledge has filtered through to grass roots communities and the 410 qoliqoli's have unique sustainable management plans, initiated by the communities themselves and are working successfully for Fijis inshore fisheries.

The national vision must encapsulate conservation of biodiversity, maintenance of productivity to sustain human needs, and multi-stakeholder management of resources. It is hoped that this vision a reference point for communicating the hopes and aspirations of participants for the long term state of biodiversity in the Fiji Islands Marine Ecoregion. At present the vision statement remains in draft and needs to be agreed.

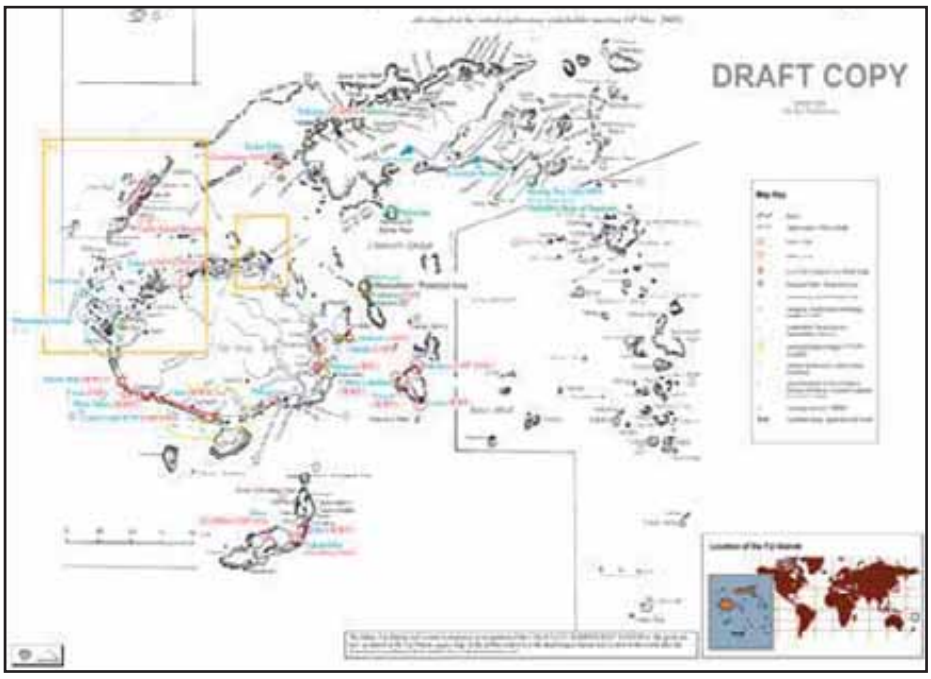
6.0 Conclusions and recommendations

6.1 Information gaps to assessing marine biodiversity

Information regarding the majority of Fiji's marine biodiversity and its distribution is far from comprehensive. Many areas of FIME have not yet been surveyed. These areas include most of the Lau, Cakaulevu and Rotuma sub-regions. Most collections have been made in the vicinity of Suva. It is estimated that at least 13% of fish species inhabiting depths of 30 metres or less, and as many as 60-80% of those at depths of 50 to100 metres, are as yet unchartered. Additionally, most information collected to date remains unpublished and much of the expertise in this area resides outside of the country.

Areas yet to be surveyed include the southern Lau Group, eastern areas of Vanua Levu, Qelelevu, Heemskerq, Cakau Matacucu, Cakau Vucovuco, the larger northern island of Vanua Levu and its smaller surrounding islands, the Great Sea Reef, the islands of Gau, Nainai, Koro, Wakaya and Namenalala and the western shores of Viti Levu. Since the FIME Visioning workshop, marine biological surveys have been conducted at the Great Sea Reef and the Namena barrier reef system to investigate the status of the reef health and marine biological diversity.

Figure 4: Sites of Resource Development and Management within the Coastal Zones of the FBR Ecoregion



6.2 Collective recommendations of the workshop participants

Moving ahead with the vision requires appropriate scientific information, capacity building, policy engagements and sustainable development of the tourism and fisheries sectors, in support of conservation and management of FIME biodiversity. The following recommendations were made by the participants of FIME workshop.

Scientific Research and Capacity building

Addressing information gaps and understanding the processes that sustain and maintain FIME's outstanding marine biodiversity will require a multidisciplinary and holistic approach, from the use of cutting edge science in coral reef mapping, to basic research on ecologically important species. The following specific recommendations were made by participants:

- Incorporate traditional environmental knowledge with scientific assessments and monitoring.
- Production of a national marine habitat map showing the extent of coral reefs, seagrass and mangrove habitats.
- Production of a literature research inventory and review to augment, refine and validate the outputs of the workshop.
- Further analysis of threats and root causes of biodiversity loss in FIME.
- Development of a centralized database and ensuring data goes to the regional and global databases.
- Translation of data into a more communicable format.
- Training of postgraduate students with the ability to conduct research and consequently the need for scholarships

Policy Engagement

Appropriate policy is mandatory for providing incentives or disincentives for best environmental practice. Participants recommended that partners engage decision makers in the Government in the following way :

- Lobby for enactment of the Environmental Management Bill. [Subsequently this was passed by Government in March 2005].
- Lobby for the new fisheries management plan to take into consideration the priority areas together with I qoliqoli boundaries and all the views of the stakeholders.
- For the National Biodiversity Strategy Action Plan implementation to use the vision map as a reference point.
- Information and maps to be disseminated to a range of ministries and local government for reference on developments.
- Lobby the government to ensure the map is used with the Environmental Management Bill to manage development in relation to the priority areas e.g. mining and building new resorts.

Tourism Development

Tourism is one of the fastest growing industries in Fiji and one that has potential impacts on the marine environment. If unmanaged it will prove drastic to the conservation of Fiji's biodiversity; a resource base for the industry itself. To avoid the boom bust cycle of tourism worldwide, Fiji must plan its tourism development well. If managed well it could also provide the source of finance for managing conservation. The following recommendations were made for tourism management.

- Education and awareness raising relating to conservation and sustainable resource management with operators and tourists.
- Marketing/communicating the vision to the tourism industry as a first step to get wider support for implementation.
- Development of niche tourism in terms of priority areas. This could be tied in with targeted research.
- Integrate FIME vision workshop outputs with tourism development.
- Communication of best practice to tourism operators.
- Enforcement of legislations, through EIA.
- Incentive schemes for resorts to improve themselves in relation to the ecoregion's priority areas.

6.3 Towards an Ecoregional Action Plan

This workshop has identified key areas for biodiversity conservation in the Fiji Islands Marine Ecoregion and has undertaken preliminary assessments of the biodiversity. It has also identified key areas for engagement and gaps in the information. This was achieved through the joint efforts of over 80 scientists, managers and socio-economists from the ecoregion. The outputs of this workshop should provide a contribution to establishing a more integrated approach to the conservation of biodiversity aspect of the environmental pillar of sustainable development by all agencies and organizations working in the Fiji Islands Marine Ecoregion.

There have already been a number of efforts nationally to conserve and manage Fiji's marine biodiversity. The first comprehensive attempt was the development of Fiji's National Biodiversity Strategy and Action Plan (NBSAP) in 1999. The strategic plan highlighted the need for more information on biological and ecological significance of Fiji's biodiversity. The outcomes of the ecoregional biodiversity visioning workshop highlighted in this report is an initial stage towards achieving this aim. Other national frameworks and plans which also offer potential for synergy with conservation action within Fiji include the national Strategic Development Plan (SDP) 2003, the National Tourism Strategic Plan (NTSP), the National Environment Strategy 1993, the Mangrove Management Plan 2003, the Tuna Management Plan 2004 and the Fisheries Strategic Plan 2003. There are also several government committees that oversee a number of environmentally related issues such as mangrove management and oil pollution response.

Several national policies also exist which provide important legislative frameworks to support conservation and marine resource management with FIME. These include the Environmental Management Act (EMA) 2005, Marine Pollution Prevention Bill 2004, National Controls on Coral Harvesting 2003.

At a regional level, organisations such as the Secretariat of the Pacific Regional Environmental Programmeme (SPREP), South Pacific Applied Geoscience Commission (SOPAC) and Secretariat of the Pacific Community (SPC) remain active and committed to marine resource management and conservation. Regional level conventions underpinning marine conservation and resource management include the Convention for the Protection of Natural Resources and Environment in the South Pacific Region and Related Protocols (SPRFP Convention) and the Convention on the Conservation of Nature (Apia Convention) and the Pacific Islands Region Oceans Policy (PIROP).

At the international level, the Mauritius Plan of Action, the result of a ten year review of the Barbados Plan of Action (BPOA); the Millennium Development Goals (MDGs); the Convention on Biodiversity (CBD); the Global Environment Facility (GEF); the principles of the World Summit on Sustainable Development (WSSD) and various other global initiatives and policies, all provide strong frameworks for achieving marine conservation and sustainable resource management goals.

In short, there are a myriad of projects, activities, strategies and policies at the international, regional, national and local level that already exist that present important opportunities for collaboration and building partnerships. It is vital that there is further integration of these policies and strategies and that a coherent governance system is in place to underpin and enable effective conservation, to promote best practice and to make the best use of limited resources. Particular opportunities for conservation include the highly successful Fiji Locally Managed Marine Area (FLMMA) network which aids communities to manage their marine resources more effectively by combining scientific appraisal and traditional management practices. In addition, if well planned and managed, in line with existing strategies and policy commitments, the tourism sector could also provide a valuable source of finance for managing conservation.

This report provides a baseline of information on the biological diversity of Fiji Islands Marine Ecoregion which paves the direction for development of targeted conservation strategies and allows for detailed investigation of Fiji's marine biodiversity. This report aims to be used as an information tool to guide decision making that is consistently reviewed according to new scientific information from further survey and investigation of biodiversity priorities mentioned during the workshop and captured in this report.

Turning the plan into action requires building political will and inspiring key stakeholders to support conservation efforts. A concerted effort is required to link these efforts and ensure coherence of policy, action and governance. Moving ahead requires appropriate scientific information, capacity building, policy engagements and sustainable development of the tourism and fisheries sectors in support of conservation and management of FIME biodiversity. WWF and its partners have committed to supporting local conservation efforts in the Fiji Islands Marine Ecoregion and to supporting the roll out of the Government commitments to conservation and marine resource management.

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Table 3: Common sea cucumber species present in Fiji

Common Name	Fijian Name	Scientific Name
Sandfish	dairo, tero	*Metriatyla scabra***
Brown sandfish	vula	*Bohadschia vitiensis**
Sea cucumber	mudra, midro	*Stichopus sp.**
Black teatfish	loaloa, lolo	*Microthele nobilis***
Surf redfish	tarase	*Actinopyga mauritiana***
White teatfish	sucuwalu	*Microthele fuscogilva***
Greenfish	sucudrau	*Stichopus chloronotus***
Lollyfish	loiloi	*Halodeima atra***
Blackfish	driloli	*Actinopyga miliaris*
Deep-surf redfish	dri-tabua	*Actinopyga echinites****
Prickly redfish	-	*Thelenota ananas****
Elephant's trunkfish	-	*Holothuria fuscopunctata****
Curry fish	laulevu	*Stichopus variegates****
Stonefish	-	*Actinopyga lecanora****

*Species of subsistence importance only
**Species of subsistence and commercial importance
***Species of commercial importance only
(Source: FFA 1994)

Table 4. Some edible molluscs found in Fiji

Common Name	Fijian Name	Scientific Name
Bivalves		
Jewel-box shell	bu, su sobu	*Chama sp.*
Arkshell	kaikoso, qeqe	*Anadara cornea*
Hardshell clam	kaidawa, kaibakoko	*Periglypta puerperal*
Venus shell	kaitakadiri, qaqa	*Gafrarium tumidum*
Littleneck clam	kaivdra	*Tapes literata*
Coconutscraper cockle	kaininiu, sakaro	*Vasticardium sp.*
Smooth giant clam	vasuadina, matau	*Tridacna derasa*
Rugose giant clam	katavatu, kativatu	*Vasticardium sp.*
Fluted giant clam	cega	*Tridacna squamosa*
Surf clam	sigawale, silawale	*Atactodea striata*
Mangrove mussel	kuku, boro	*Modiolus agripetus*
Mangrove oyster	dioniveitiri	*Crassostrea mordax*
Thorny oyster	kolakola, saulaki	*Spondylus ducalis*
Pigmy pearlshell	civaciva, civare	*Pinctada martensi*
Gastropods		
Spider shell	yaga, ega	*Lambis lambis*
Red-lipped stromb	tivikea, gwerativi	*Strombus luhuanus*
Stromb	golea, gerra	*S. gibberulus*
Trochus shell	sici, leru	*Trochus niloticus*
Top shell	tovu	*Tectus pyramis*
Moon snail	drevula	*Polinices flemingiani*
Polished nerite	madrali	*Nerita polita*
Horn shell	ciciyarayara, durulevu	*Cerithium nodulosum*
Turban shell	lasawa	*Turbo chrystomus*
Polished nerite	madrali	*Nerita plita*
Miscellaneous		
Chiton	tadruku	*Acanthozostera gemmata*
Green seahare	veata, kotia	*Dolabella auricularia*
Black seahare	veataika, kotiaika	*Dolabella sp.*

Source: Lewis (1996); FFA (1994)

Table 5: Some important crustacean species found in Fiji

Common Nme	**Local Name**	**Scientific Name**
Lobster species		
Golden rock lobster	uraukula, rauvatuvatu	*Panulirus penicillatus*
Painted rock lobster	uraudina	*P. versicolor*
Whiskered lobster	-	*P. longipipes femoristriga*
Ornate rock lobster	urautamata	*P. ornatus*
Slipper lobster	vavaba, ivinibila	*Parribacus caledonicus*
Shallow water marine prawnsgilled shark		
Giant tiger prawn	urakeirasaga	*Penaeus monodon*
Witch prawn	uranicakau	*P. canaliculatus*
Green tiger prawn	-	*P. semisulcatus*
Western king prawn	-	*P. latisulcatus*
Greasy prawn	-	*Metapenaeus anchistus* ***M. elegans***
Banana prawns	-	*P. merguinsis*
Deep water marine prawns		
Common Name	**Scientific Name**	
Pyjama shrimp	*Parapandalus serratifrons*	
Striped soldier shrimp	*Plesionika edwardsii*	
Striped gladiator shrimp	*P. ensis*	
Armed nylon shrimp	*Heterocarpus ensifer*	
Mino nylon shrimp	*H. sibogae*	
Humpback nylon shrimp	*H. gibosus*	
Smooth nylon shrimp	*H. laevigatus*	

Source: adapted from FFA (1994)

Table 6: Cetacean species thought to be found in Fijian waters

Common Name	Scientific	Known, or probable temporal and spatial distribution	Comments
Humpback whale	Megaptera novaeangliae	Mainly June – Setpember	Reliable sightings of calving in Koro Sea
Bryde's whale	Balaenoptera edeni	All year	Probably the most abundant mysticete in the Pacific, some groups migratory
Sperm whale	Physeter catodon	All year throughout region	Most abundant large cetacean in the Pacific; good historical database.
Dwarf sperm whale	Kogia simus	All year; probably widespread in region	Known strandings in Guam and New Caledonia
Short-finned pilot whale	Globicephala macroryhnchus	All year; probably found throughout the Pacific	
Melon-headed whale	Peponocephala electra	All year; probably found throughout the Pacific	Many strandings in neighbouring countries Nauru, Vanuatu and Guam
Pigmy killer whale	Feresa attenuata	All year; probably found throughout the Pacific	A widely distributed species, circumglobal in tropical and subtropical waters
Short-beaked common dolphin	Delphinus delphis	Reported from New Caledonia, probably also from Fiji	Common dolphin recently reclassified as two distinct species: short-beaked and long-beaked
Bottlenosed dolphin	Tursiops truncates	Likely to be in many parts of the Pacific all the year round	Widely distributed
Spinner dolphin	Stenella longirostris	Confirmed presence in many parts of Fiji	Often found in schools resting in lagoons or near deep water passages; a population in Southern Mamanucas used as ecotourism resource
Rough-toothed dolphin	Steno bredanensis	Likely to be in many parts of the Pacific all the year round	Widespread species in both tropical and temperate waters
Cuvier's beaked whale	Ziphius cavirostris	Probably common in deep water	Cosmopolitan species occurring throughout the world
Beaked whales	Mesoplodon sp.	Some of the 13 species in this group are likely to be found in Fijian waters	Poor records exist for this group

Source: Whippy-Morris and Pratt (1998)

ANNEX 3: Workshop Photos

WWF