Fiji Ridge to Reef (R2R) Project

A case study of Ba Catchment of Fiji

By the Institute of Applied Sciences

The University of the South Pacific

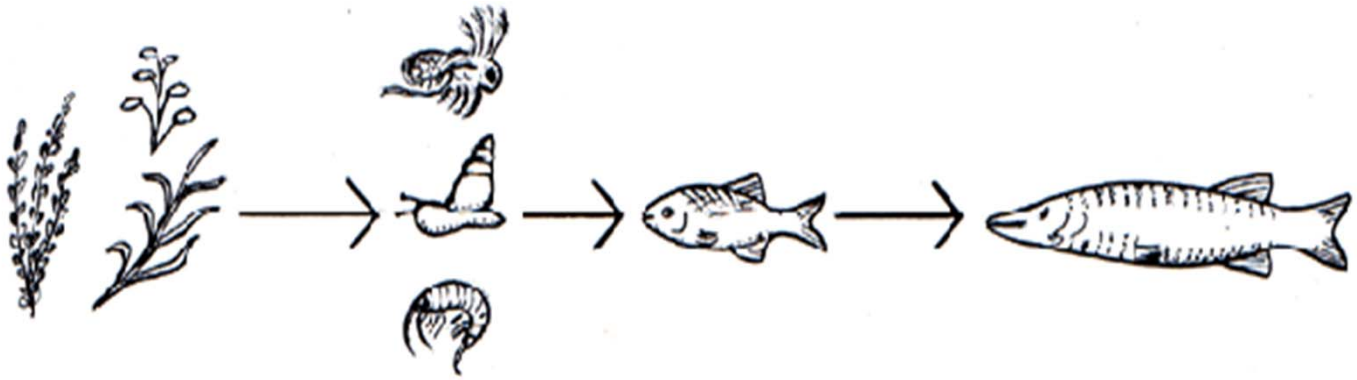
Fiji GEF 5 STAR R2R Ridge to Reef Project

- Part of the Program on "Pacific Islands National Priorities MultiFocal Area 'Ridge-to-Reef' (R2R) – to maintain and enhance Pacific Island countries' ecosystem goods and services (provisioning, regulating, supporting and cultural) through integrated Water, Land, Forest, Biodiversity and Coastal Resource Management that contribute to poverty reduction, sustainable livelihoods and climate resilience."
- Objective: preserve biodiversity, ecosystem services, sequester carbon, improve climate resilience and sustain livelihoods through a ridge-to-reef management of priority water catchments on the two main islands of Fiji
- The R2R planning and overarching management approach is comprehensive; it aims to cover all activities within a catchment and out to the sea to ensure natural resource sustainability and biodiversity.
- The selected priority catchments are Ba, Tuva and Waidina/Rewa on Viti Levu and Labasa, Vunivia and Tunuloa district on Vanua Levu.

Forest Health=River Health=Reef Health

- No soil/bank erosion
- Natural nutrient load
- Successful species migration, breeding and colonization
- Intact micro-habitats
- Clean water discharge to reefal community

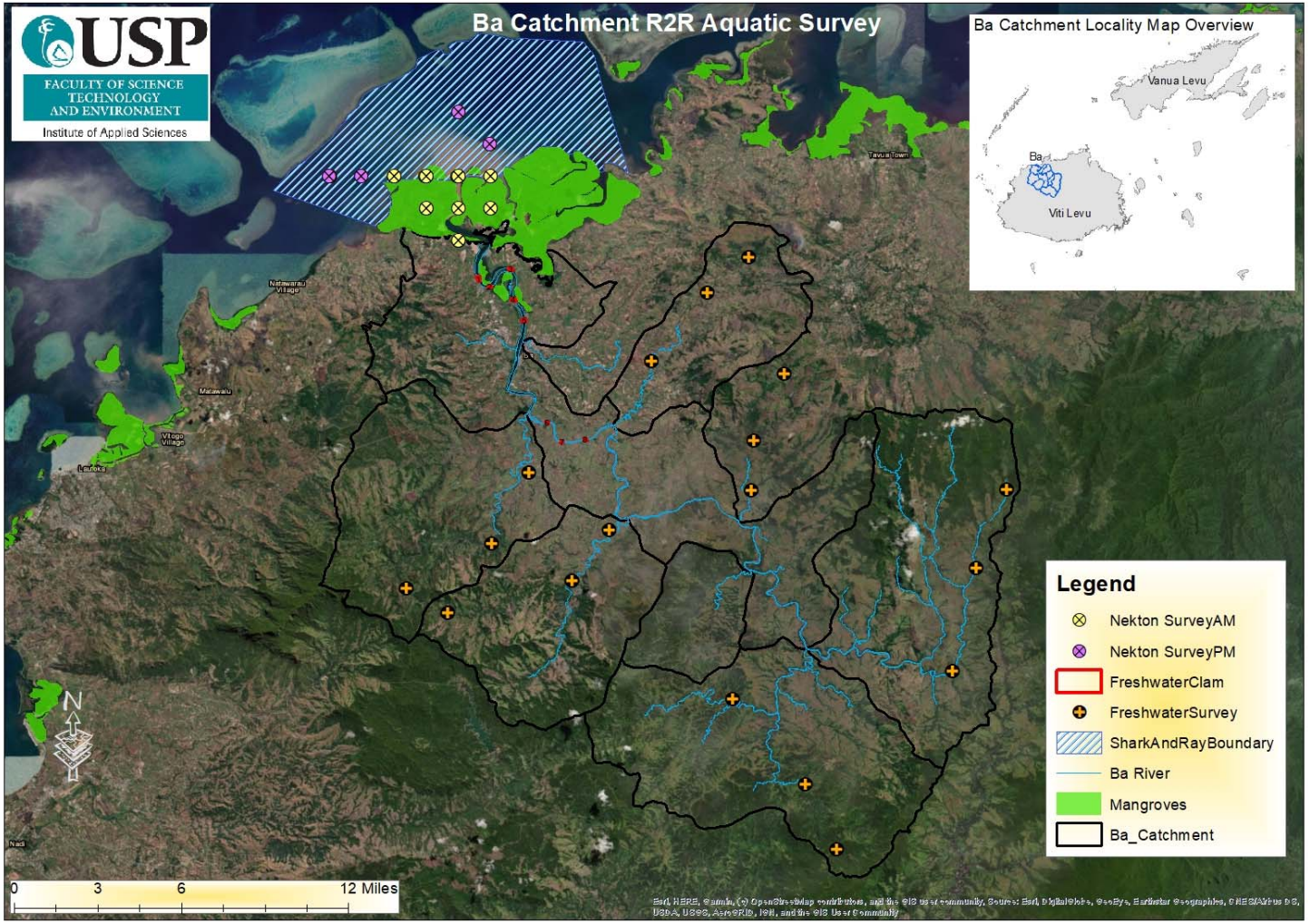
The synergy of River Residents, Resource Owners & Scientists



- **Food Security**
- **Bioindicators of river health & catchment health**
- **Biofilters**
- **Income generation**
- **Invasive Alert**

Bioassessment sites of Ba catchment

- Component of the Largest province in Fiji
- Ba River sub-catchments
- Population ≈ 15, 000
- Rain shadow
- Agricultural hotspot
- Flood hotspot
- 17 sites surveyed across 6 sub-catchments



Freshwater Biota Assessment highlights of the Ba River

Plankton sampling

Electrofishing

BMI sampling

Freshwater Fish- The connectivity

- Total of 13 fish species recorded.
- Two native fish species (*Anguilla marmorata* and *Sicyopterus lagocephalus*) and the introduced western mosquitofish (*Gambusia affinis*) and Tilapia (*Oreochromis niloticus*) were relatively abundant, while other species caught were in moderate abundance or were rare.
- The presence of native fish and crustaceans at a site indicates that it is ecologically connected to the ocean and that no major natural or artificial barriers (e.g. waterfalls or major dams) occur between the site and the estuary.
- Maintaining connectivity between the freshwater and marine environment is key to the regenerative natural process of sustaining fish stocks in rural inland communities of the Ba catchment.

Red tail goby (*Sicyopterus lagocephalus*)

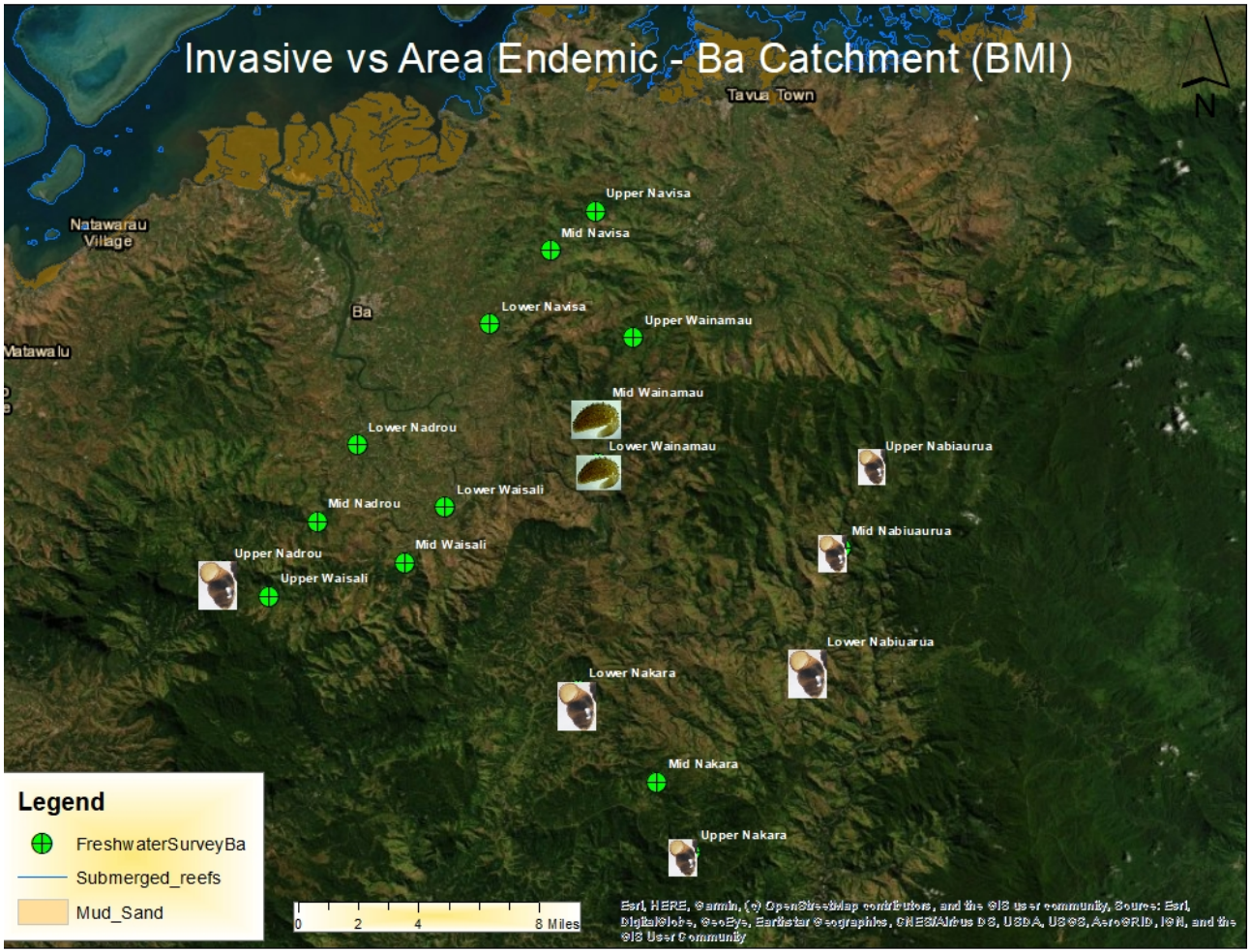
Giant marbled eel (*Anguilla marmorata*)

Tilapia

Macroinvertebrate taxa of ecological importance- Invasive vs Area Endemic

- Globally listed **Invasive leech** *Helobdella europaea* (size: (16mm long) recorded from upper and mid Wainamau, abundant population observed at Koroboya village.

- Social threat: aesthetic values



- The minute (3-5mm shell) freshwater spring snails (*Fluviopupa* spp.) of the family Tateidae.

- Spring snails are **bioindicators of excellent water quality** and **intact forest systems**.

Food Security: Freshwater Clam (*Batissa violacea*)/Kai

- Women Fishers in the age group of 30-40.
- Local Market price- $5/heap.
- According to the fishers while the Kai bed has shifted upstream, they are still finding a lot of Kai although the larger ones can be observed in tributaries.

WASH Management

More clear separation of upstream (drinking, bathing) and downstream (laundry, dishes, agriculture, livestock) uses of stream water could help improve sanitation and hygiene in some communities.

Source: Fiji Times

Traditional Ecological Knowledge (TEK)

- **Culturally significant species**

Totems per clan (mataqali): Fish, plant & a terrestrial animal (possibility of aquatic life stages e.g. dragonfly/damselfly)

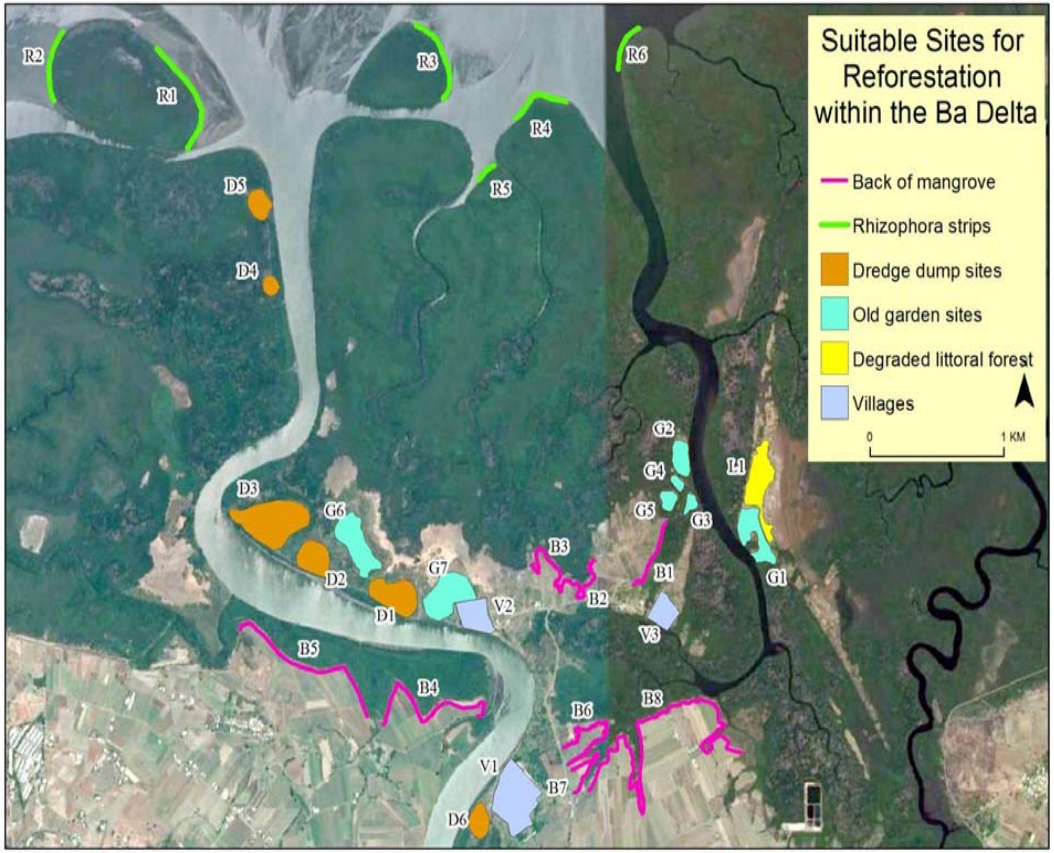
- **Traditionally Significant habitats**
- **Native names**

- *Mother kai* (biggest clam) is located around **Nasolo area.**

Ba Mangrove vegetation

#	Habitat (Community)	Plots	Area (m^2)
1	Tiri Alliance	6	2400
2	Selala Alliance	7	2800
3	Stunted Tiri	2	800
4	Mudflats	2	800
5	Closed Forest	4	1600
6	Gardens & Back of mangrove	3	1200
7	Dredge Dump	2	800
		26	**10400**

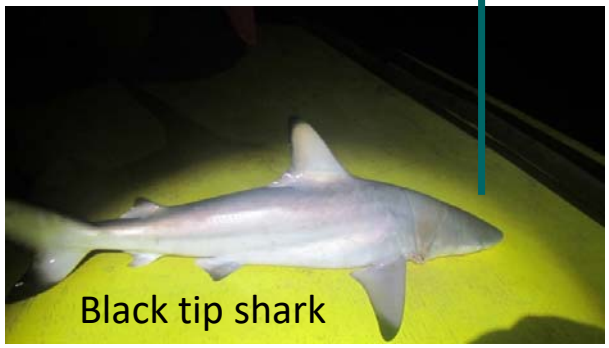
A total of **seven** habitats or communities were sampled and identified based on the woody plants (trees and shrubs) composition.



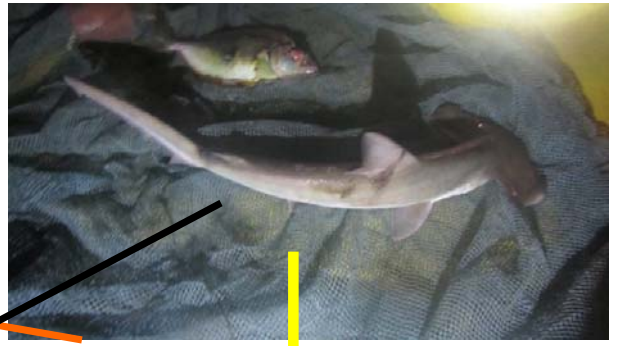
Broad Scale Nekton & Elasmobranch Survey of Ba River Delta: Threatened Species

Sting ray

Guitar ray fish

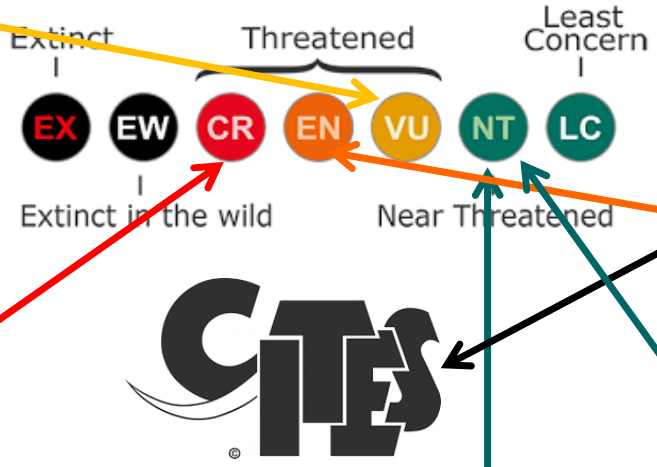


Black tip shark



Scalloped Hammerhead shark

Bull shark



Ba mangrove delta significance & current issues

- Nationally and internationally the Ba mangrove delta is an important area for multiple species of sharks that are listed as threatened on the IUCN Red List.
- It is also important nursery area for many of Fiji's important food fish and crustaceans.
- Upstream-downstream communities
- Threats include sand dredging, gravel extraction, sand mining and unsustainable fishing which can alter micro-habitat stability and faunal diversity.

- **Ban on gill net**
- Encounter with 2 fishermen who caught 5 female pups

Shark bycatch: (Bull Sharks *Carcharhinus leucas*) listed **Near Threatened** in **IUCN Red List**

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- The **landowners** of Nakara, Nabiaurua, Wainamau, Nadrou,Navisa and Waisali

Mangrove survey team in Ba River Delta

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