

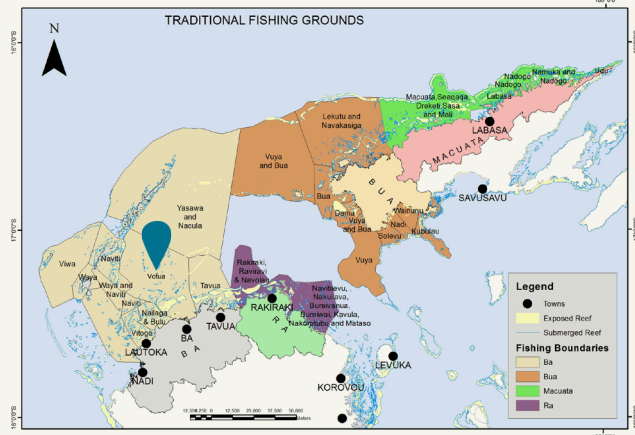


VOTUA QOLIQOLI

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Habitat Type	Qoliqoli cover (ha)	Total GSR cover (ha)
Coral Reefs	2,552 ha	58,800 ha
% hard coral cover	31 ± 6%	34 ± 2%
Mangrove	4,496 ha	34,100 ha
Seagrass	1,074 ha	17,200 ha
Mean fish abundance	2,213 ± 227 ind/ha	2,878 ± 189 ind/ha
Mean fish biomass	208 ± 29 kg/ha	421 ± 60 kg/ha

EXTENT SUMMARY



Critical Habitat Cover

Critical ecosystems were surveyed at sites within the *qoliqoli*, including coral reefs, mangroves, and seagrass.

Votua *qoliqoli* spans 1,554 km² and is located in Ba Province (off the northwest coast of Viti Levu).

The *qoliqoli* falls under the customary ownership of clans within Votua Village, which lies within the district of Nailaga. Surveys were completed at 11 sites within Votua; seven were located in the coastal area close to Ba Estuary, while four were located on the patch reefs further offshore in the center of the *qoliqoli*.

Votua contains a series of large shallow reefs with channels passing through them, which are heavily influenced by the input from the adjacent Ba river.



Fiji's GREAT SEA REEF

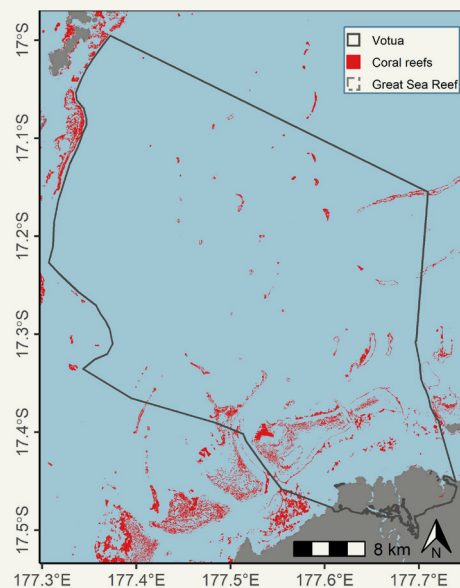
Fiji's largest reef system, the Great Sea Reef otherwise known locally as Cakaulevu, includes the third largest barrier reef in the world. The Great Sea Reef region stretches along an arc over 450 km long from western Viti Levu to eastern Vanua Levu.



Qoliqoli

Customary fishing areas managed by indigenous communities, centuries old, that grant access and rights to fish. Thirty-three distinct *qoliqolis* divide the entire Great Sea Reef area.

Coral Reefs



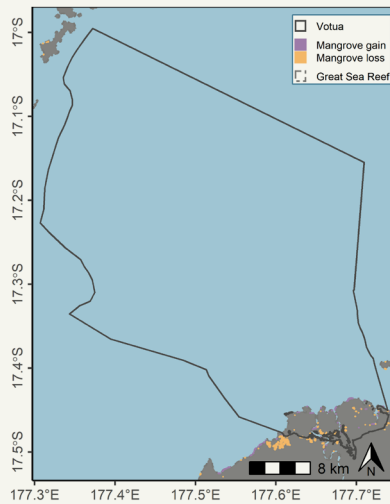
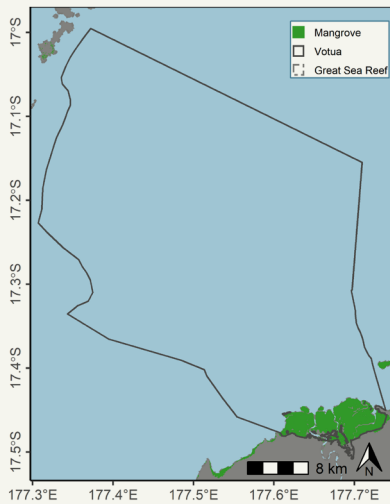
- Reefs are in the offshore area as a large coastal-associated system and as isolated patch reefs in the center of the *qoliqoli*.
- **Coral cover:** approximately 2,552 ha; 6,426 ha including reef related ecosystems (e.g. algae, microalgal mats, rock, rubble).
- **Reef types:** majority are inner reef flats (3,126 ha), significant outer reef flats (2,094 ha), significant shallow lagoons (1,236 ha), and terrestrial reef flats (1,176 ha), with other reef types also present.

Reef type	Area (ha)
Inner Reef Flat	3,126
Outer Reef Flat	2,094
Plateau	329
Reef crest	33
Reef slope	341
Shallow Lagoon	1,236
Sheltered Reef Slope	725
Terrestrial reef flat	1,176



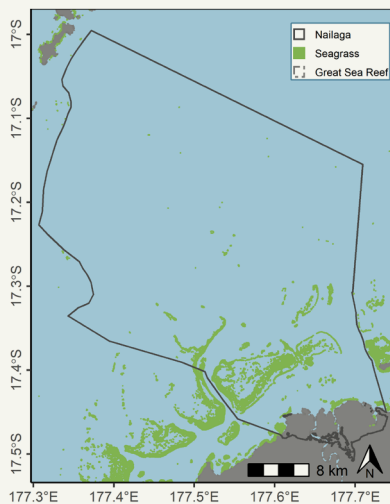
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Mangroves



- High mangrove cover reflects extensive mangrove stands in the coastal areas of Viti Levu.
- *2016 mangrove extent: 4,496 ha*
- *Mangrove change:* With 4,506 ha recorded in 1996, there was a net loss of 9.76 ha up to 2016. However, this hides that there has been more mangrove change. Between 1996 and 2016, 18.47 ha of mangroves were lost, while mangroves expanded to cover 8.70 ha of area previously barren.

Seagrass

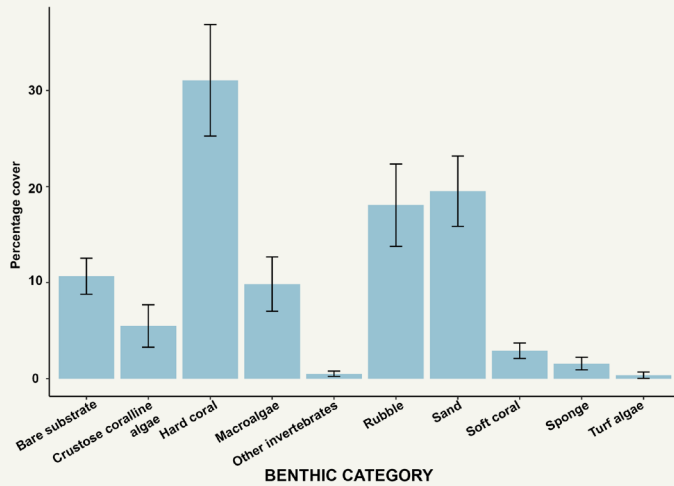


- Seagrass covers approximately 1,074 ha



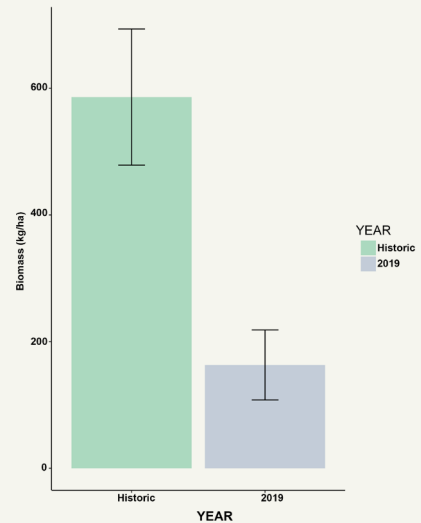
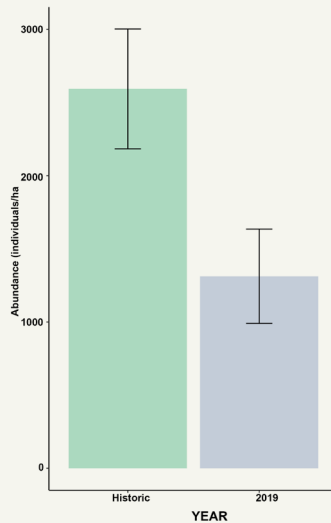
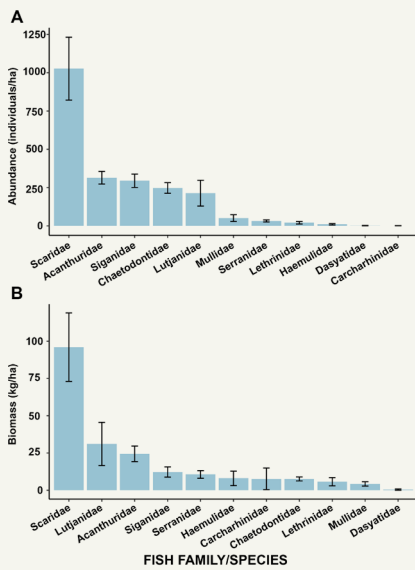
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Benthic Cover



- % hard coral cover was 31 ± 6%
- Second highest live benthic cover on reefs was macroalgae, at 10 ± 2%
- Soft coral and sponge were low, at 3 ± 1% and 2 ± 1%, respectively.

Fish Communities



- Fish communities were dominated by herbivores by both abundance and biomass. The most abundant fish family was Scaridae, followed by Acanthuridae and Siganidae. The largest family by biomass was also Scaridae, with acanthurids the third largest. The greatest carnivorous family by both abundance and biomass was Lutjanidae—though this was low in abundance and biomass compared to elsewhere in the GSR.
- Fish abundance and biomass were similar between Ba Estuary and Central Ba.
- Mean fish abundance for key family*/species was 2,213 ± 227 ind/ha across all Votua sites in 2019.
- It was very likely (V=20, p=0.06) that key fisheries family abundance declined for the six sites in Ba Estuary compared to historic data (2011). In 2010, abundance was 2,593 ± 410 ind/ha, declining to 1,313 ± 323 ind/ha in 2019.
- Mean fish biomass for key family/species was 208 ± 29 kg/ha in 2019.
- It was extremely likely (V=21, p=0.03) key fisheries family biomass also declined for the six sites. In 2010, biomass was 586 ± 107 kg/ha, falling to 163 ± 55 kg in 2019.

*Key Fisheries Families: Haemulidae (sweetlips), Lutjanidae (snapper), Scaridae (parrotfish), and Serranidae (grouper)

Rare Species



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- No humphead wrasse (*Cheilinus undulatus*) or bumphead parrotfish (*Bolbometopon muricatum*) were recorded within Votua during the 2019 survey. Historic fish surveys at the six sites in Ba Estuary observed both species (3.33 ± 3.33 ind/ha and 1.21 ± 1.31 kg/ha; 27 ± 27 ind/ha and 23 ± 23 kg/ha, respectively). This represented a single school of eight bumphead parrotfish in the 35-40cm range at a single site.
- Serranidae abundance and biomass was 32 ± 6 ind/ha and 11 ± 3 kg/ha, respectively, across all Votua sites surveyed in 2019. For the six Ba Estuary sites with historic data, it was *very likely* ($V=20$, $p=0.06$) that Serranidae abundance declined, from 113 ± 45 ind/ha in 2010 to 19 ± 7 ind/ha and also *likely* ($V=18$, $p=0.16$) that Serranidae biomass declined, from 38 ± 17 kg/ha in 2010 to 6 ± 2 kg/ha.
- Sharks in the family Carcharhinidae were recorded at an abundance of 0.01 ± 0.65 ind/ha and biomass of 7.65 ± 7.25 kg/ha across all Votua sites in 2019. Historic surveys around the six Ba Estuary sites suggest that it is *exceptionally unlikely* ($V=2$, $p>0.99$) that shark abundance or biomass changed within Ba Estuary

Management RECOMMENDATIONS

1. Expansion of protected areas and other effective conservation measures (OECMs)
2. Develop specific rare/endangered wildlife species conservation programs
3. Improve sustainable fisheries management
4. Promote incentives and livelihoods approaches that support sustainability/conservation
5. Strengthen customary and state governance systems for formal/informal management approaches
6. Increase cross-institution coordination
7. Develop sustainable financing plans/mechanisms for conservation
8. Instigate legal protection for mangroves and restore where needed
9. Assess/mitigate environmental impacts of land-based activities
10. Assess/mitigate environmental impacts from coastal resource extraction
11. Promote sustainable coastal development
12. Establish regular monitoring/evaluation for adaptive management

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FOR MORE INFORMATION, SEE ANDRADI-BROWN D.A., VEVERKA L., FREE B., RALIFO A., AREKI F. (2020) STATUS AND TRENDS OF CORAL REEFS AND ASSOCIATED COASTAL HABITATS IN FIJI'S GREAT SEA REEF. WORLD WILDLIFE FUND US, WWF-PACIFIC PROGRAMME, AND MINISTRY OF FISHERIES FIJI. WASHINGTON, D.C. & SUVA. DOI: 10.6084/M9.FIGSHARE.13226910 OR CONTACT INFOR@WWFPACIFIC.ORG