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Baseline Biological Survey Report of the Votua Marine Protected Area  
(Namahara) (English version), Tikina Korolevu-i-Wai, Nadroga

IAS ENVIRONMENTAL STUDIES REPORT NUMBER: 127

2003

By

Cakacaka, A., Vave, R and Meo, S

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Baseline Biological Survey Report  
of the Votua Marine Protected Area  
(*Namahara*) (*English Version*)  
*Maroroi sia ni kua hauju I qwata project*  
Tikina Korolevu-i-Wai, Nadroga

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Akuila Cakacaka  
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**Votua Marine Protected Area (Namahara) Baseline Biological Survey Report  
by Akuila Cakacaka, Ron D. Vave and Semisi Meo.**

**Introduction**

Votua is one of the villages along the coral coast in the district of Korolevu-i-wai and is the center of as many tourist development arena and interventions. The village comprises of thirty five households and a populations of two hundred and sixty, majority of which are employed in hotels in the coral coast. The village co-manages a dive shop in the village vicinity with a businessman from the US operating as Mikes Dive Shop. Most of the hotels and resorts along the coral coast utilize the dive operation center to allow tourists an adventure into the underwater world. At least half a mile from the village is the renowned Vilisite's Restaurant which is directly in front of the village marine protected area (mpa). The mpa site is locally referred to as Namahara (~Namasara).

The Votua biological survey was undertaken on two alternate days on Wednesday the 23<sup>rd</sup> of April and on Thursday the 29<sup>th</sup> of May, 2003. Votua had set up a taboo area in early April 2003. The village headman or *Turaga ni Koro* (T/K) who is employed at the dive shop together with the dive instructor had the impression that the mpa was to assist them in coordinating internship programs for various institutions abroad that are interested in studying marine conservation and pertinent avenues. Apart from benefiting from employment opportunities, share of profits and the internship program, the communities are beginning to reap initial benefits from spill over effect. This comes in so early after the imposition of the mpa.

The mpa extends from the beach front right to the reef crest. The boundaries are demarcated with buoys extending in line towards the reef crest. The dive shop is not separated but towards the east end of the village, the closest to Suva out of the villages in the Tikina.

The area that will be available for harvesting/fishing is the adjacent sides of the taboo area.

**Survey area**

The mpa area covers an estimated 2 square kilometers and is situated east of the village. Directly opposite the mpa site is the Vilisite's restaurant and Mike's Dive from close range across.

The left side of the mpa (towards the Suva end) is largely comprised of live corals and rocks (rubble), in addition to the moderate macroalgae cover. The right side of the mpa (Nadi side) is sandier and rubbles with low coral cover. Some Crown of Thorns (COTs) starfish were observed in the mpa area. There were few large *Acropora* species less than 2m across.

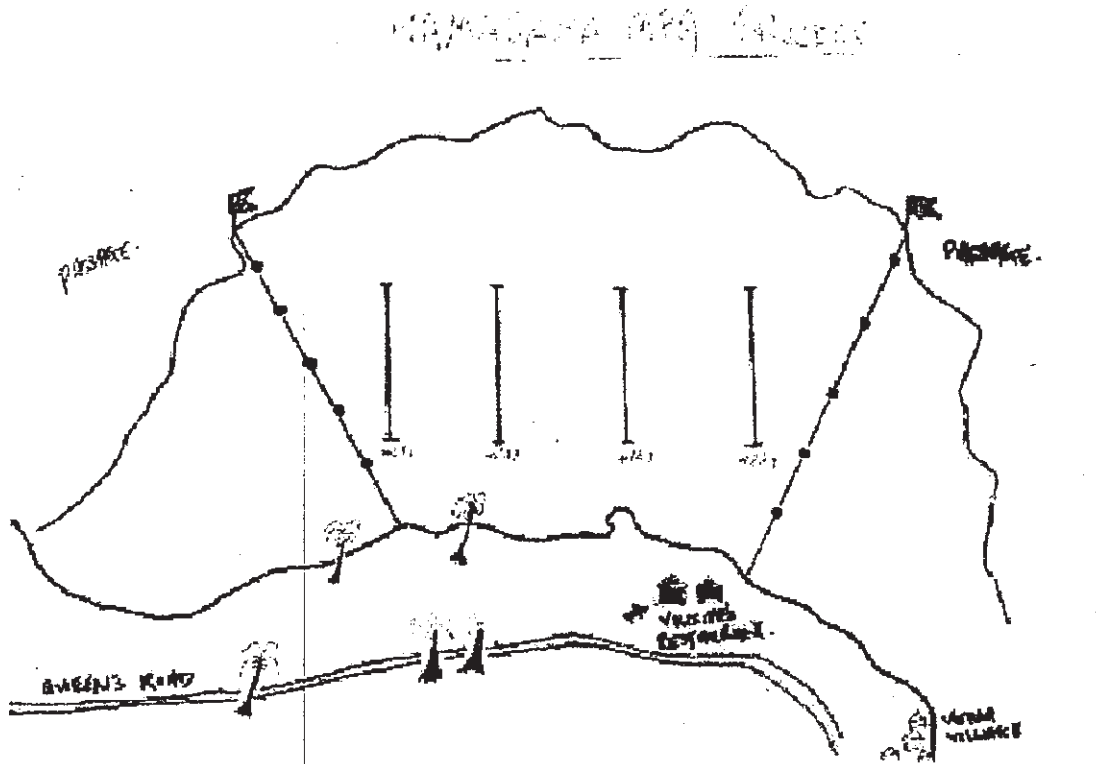
Ten buoys that had been provided by the Fiji Locally Managed Marine Area (FLMMA) network were used to demarcate the proposed taboo area, with five buoys on each boundary.

The control site or harvested area surveyed is located directly in front of the village. The area composed mainly of rocks, rubbles and some live corals but not only the brain corals and

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hardly any branching ones. There were different species of fishes observed (refer to appendix) around the area. The control site was surveyed focusing on the indicator species but other observed common species were recorded as this was the baseline data for the community.

Fig 1.0: Map of taboo area



Indicator species

The indicators chosen by the Votua community were the *ulavi* (scaridae), and the *lahe* (coral). As this was the baseline survey for the series of data collection to be conducted other well known important marine resources were recorded.

Monitoring method

Two survey methods were employed for monitoring of the indicators chosen.

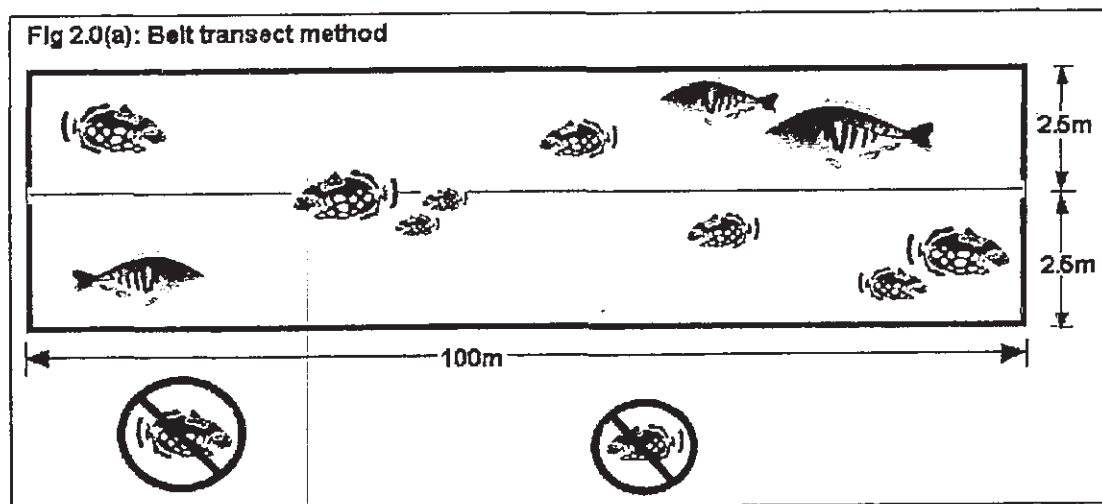
First is the 100m x 5m belt transect which can be used not only for *ulavi* but for other fishes. Transects were positioned perpendicular to the reef crest instead of parallel so as to:  
(a) cover large, representative areas of the fishing ground and

(b) to determine variation (if one exists) in marine resource abundance especially for the indicators from shore to reef crest (see Fig 1.0).

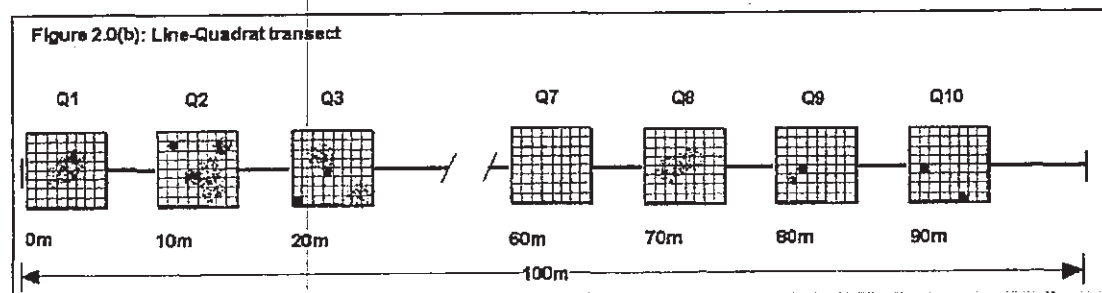
All *ulavi* and food-fishes and rare fishes observed within the belt transect were counted, with one person counting and another recording.

The second method is the line-quadrat method and can be used to determine benthic cover including corals, algae, sponges, abiotics, in addition to benthic fauna. In this case, it is used to determine the area covered by living coral. The same 100m tape for the fish counts was used. The only difference is that quadrats (1m x 1m in size) were placed at every 10m, beginning at 0m and finishing at 90m, totaling 10 samples (see map). The area within the quadrat is seen as 100%, and surveyors estimate only the percentage covered by living corals.

Both the above methods, though different were still undertaken on the same 100m tape.



Fish observed outside the 100m x 5m belt transect are not counted. In Fig 2.0(a) above, all the fish within the belt are counted, but not the two outside.



## Monitoring Results

### *Taboo area*

Taboo area monitoring was conducted in April starting at around 11am and finished around 3:30pm. No boat was used for the survey so the entire distance between transects had to be walked. A briefing on the implementing of both methods and hints on data recording techniques was conducted prior to the actual on survey.

### *Weather*

Weather was fine, with cloud cover of about 6 okta. Low tide was around 5.53am and high tide at 11.57am.

### *Indicator fish counts*

	MPA 1	MPA 2	MPA 3	MPA 4	Average
Parrotfishes	32	25	30	31	30

*Live coral cover:* 19.4 %

The collated results are summarized in Appendix A.

### *Control site area*

Control area monitoring was conducted in May starting at around 2.30pm and finished around 6:00pm. No boat was used for the survey so the entire distance between transects had to be walked. A briefing on the implementing of both methods and hints on data recording techniques was conducted prior to the actual on survey for the benefit of new monitoring team.

### *Weather*

Weather was fine, with cloud cover of about 5 okta. Low tide was around 11.39am and high tide at 5.38pm.

### *Indicator fish counts*

Target species	Transect 1	Transect 2	Transect 3	Transect 4	Average
Ulavi (Scaridae)	40	74	45	17	44.0

*Live coral cover:* 41.8 %

Collated results from the control site are summarized in Appendix-B.

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Appendix A

Project Namasara One

Date: 23 April 2003

Time: 11.46am

Tide: High/rising

Status- Tabu

Condition: Clear/sunny

Indicator: Parrotfish, live coral

	MPA 1	MPA 2	MPA 3	MPA 4	
10	30	65	40	35	
20	15	5	2	18	
30	17	35	13	18	
40	10	8	8	13	
50	13	4	4	10	
60	8	2	4	40	
70	9	10	65	70	
80	40	16	2	70	
90	18	8	13	5	
100	13	2	3	13	
	17.3	15.5	15.4	29.2	19.4

Parrotfishes	32	25	30	31	30
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Live coral

cover 19%

Parrotfish 0.0197

0.019/m<sup>2</sup>

Monitors: Epeli Barage, Pita Aminio, Pita Waqe, Milika Nautiga

Erami Seavula, Wainikiti Seavula, Courtney Jamison, Semisi

Meo

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