Abundance of commercially important species of invertebrates, fish and the status of coral health in Community Based Marine Protected Areas in Gela, Central Province, Solomon Islands

Title : Gela tamboo areas Monitoring Report

Time Frame: **May 10th – 17th 2007**

Implementing Agent:

Hugo Tafea
P.O Box 147, Honiara, Solomon Islands
Tel: 25389
Email: hugo.tafea@fspi.org.fj or
Daula@solomon.com.sb

Thomas Bebeu
P.O Box 147, Honiara, Solomon Islands
Tel: 25389
Email: thomas.bebeu@fspi.org.fj

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Solomon Islands

Locality of Project: **Sandfly, Gela, Central Province**
Solomon Islands

Collaborative Agencies: Ministry of Fisheries & Marine Resources (MFMR), Foundation of the People of the South Pacific International(FSPI)

Government Ministries, NGO's, Village Demonstration Worker (VDW) for Gela project sites and village communities

INTRODUCTION

The sites at Sandfly in Gela, Central Province were established over a three year period (three sites in 2004, two sites in 2005 and one site in 2007) after a series of workshops on good governance and marine resource awareness raising under the coral gardens project which was implemented by SIDT, ECANSI and Fisheries Division of the Solomon Islands government with funding from SPREP through FSPI. The sites are all community owned although two of them are owned and operated by resort owners who are indigenous residents of Gela.

The awareness raising programmes were conducted from year 2000 onwards and the impact it had led the communities to realize the need to conserve their most depended upon marine resources which were declining at a pace they were unable to control if no immediate steps were taken. They also realized that as a result of this, more time would be spend to fish for the family's daily protein and subsistence needs, as they would be going out to distant fishing grounds.

With insufficient land area to do gardening to meet their ever-increasing daily subsistence needs especially in the form of cash for school fees and household items etc, the only option was to resort to marine resources to meet these particular needs. The shortage in marine resources therefore is due mainly to "fish for cash" which is also stimulated by the closeness of the Gela fishing grounds to the markets in Honiara as compared to other island provinces in Solomon Islands. The latter has also created an even greater problem as it attracts fishermen from neighboring provinces, mainly Malaita who use destructive fishing practices such as dynamite fishing and gillnetting as a means to increase their catch, thus giving a good return at the end of the day.

The marine resource species monitored and discussed in this report included those that were selected by the communities as their indicator species and those that are very important economically e.g. sea cucumbers to the economy of the country. For purposes of clarification, beche-de-mer is produced from sea cucumbers through the process of boiling, cleaning, drying and, in some cases, smoking. Ramofafia 2004. In some cases however, the reader will need not be confused as the Solomon Islands national language, "Solomon Pigin" also uses the word "beche de mer" to refer to sea cucumbers. Should that context arise the reader will have to be reminded.

BACKGROUND

The sites at Gela can be divided into two different categories. The first category belongs to those sites that are exposed to oceanic influences and immediate wave actions (Salavo and Maravaghi) and those that are situated in lagoon - like areas and are well protected from immediate wave actions (Taburu, Sisili, Tulaghi, Rodrigue Bay). These sites can be further identified by their reef structures and the types of marine resources they support. A classic example of this would the occurrence of the gastropod, *Trochus niloticus*. ????

As mentioned in the introduction, sites monitored during this trip included MPA's and their control sites that were established mainly in 2004 and 2005. Two of the sites that were treated as controls (also referred to as reference sites) in 2004, have now become MPA's of their own. These include Rodrigue Bay and Tulaghi Island which were controls for Taburu and Sisili MPA's. Rodrique Bay became an MPA in 2005 and Tulagi was declared an MPA during the 2007 monitoring. In most of the three districts (Gela, Marau Sound and Langa Langa Lagoon) where MPA sites were established at, the control or reference areas are often treated or regarded also as tambu sites. Although communities were told that control sites were open areas for fishing activities to continue, this was not often the case. For this purpose and the fact that data for these sites (Tulaghi and Rodrigue Bay) were available since 2004, these will be used in this report.

METHODS

The methods used in collecting the baseline data and the first monitoring data in 2004, 2005 and 2006 were adopted from the Arnavon Marine Conservation Area (AMCA) study (Lincoln-Smith and Bell, 1996). These procedures and sampling methods were also described in Ramohia (2004) and Ramohia *et al.,* (2005) and is targeted only on key commercially important marine invertebrate species. As explained also in previous baseline studies (Ramohia, 2004 and Ramohia *et. al.,* 2005) the sampling methods were selected for the following reasons:

- (i) The methods are suitable and relevant for monitoring the monitoring program i.e. monitoring of important commercial marine invertebrates.
- (ii) The methods are simple and therefore are easy to learn quickly.
- (iii) Because the methods are simple and therefore easy to learn quickly, the training component of the monitoring program can be successfully implemented within a short period of time.

It is important to note three very important things here with regards to the monitoring that took place from 2004 to 2006 and from 2007 onwards:

1. from 2004 to 2006 data collection was focused mainly on commercially important invertebrate species (eg. *Trochus niloticus*, all bech de mer species, blacklip and pearl oysters), those that were utilized as food resources (e.g..all giant clam species) and two shell-money species, Ke'e (*Beguina semiorbiculata*) and Kurila (*Atrina vexillum*). (Ramohia, 2004 and Ramohia *et. al.,* 2005), listed in Table 4.
2. with lessons learned in the years after the first baseline and monitoring and the adoption of the FLMMA monitoring method, in 2006 - 2007, respective communities were asked to do species ranking to determine up to 5 species of fish and invertebrates that were most important to them (for household consumption, that have high economic value and traditional, cultural and custom values) to be the list of species that would be monitored annually. This however, will not limit the continuous monitoring of other economically valued marine resources such all sea cucumber species which Sulu *et al* reported its export earnings in 1997, 1998 and 1999 to be rated second to Trochus and other gastropod products.
3. Further to this, data collection on coral cover was included as a means to measure reef health.

In 2007, as a means to have comparable results with other Pacific Island neighbors who were also funded under the same programme, the need for a standard monitoring regime was necessary, thus leading to the use of the LMMA monitoring method which has been implemented and tested at sites in Fiji by Fiji Locally Managed Marine Area Network, FLMMA.

As this study is geared towards the monitoring of the abundance of invertebrates, fish and coral health status, the reader is referred to visit **'Community Based Biological Monitoring Training Guide"** Tawake . A; Meo S; Cakacaka A; Aalsbersberg B March 2007. For the readers convenience the monitoring methods are as follows:

BIOLOGICAL SURVEYS METHODOLOGY

A). BELT TRANSECT METHOD

OBJECTIVES

1. To determine density (number) of fish and other marine resources that move around slowly on the reef and invertebrates that can easily be seen while snorkeling.

Material Preparation

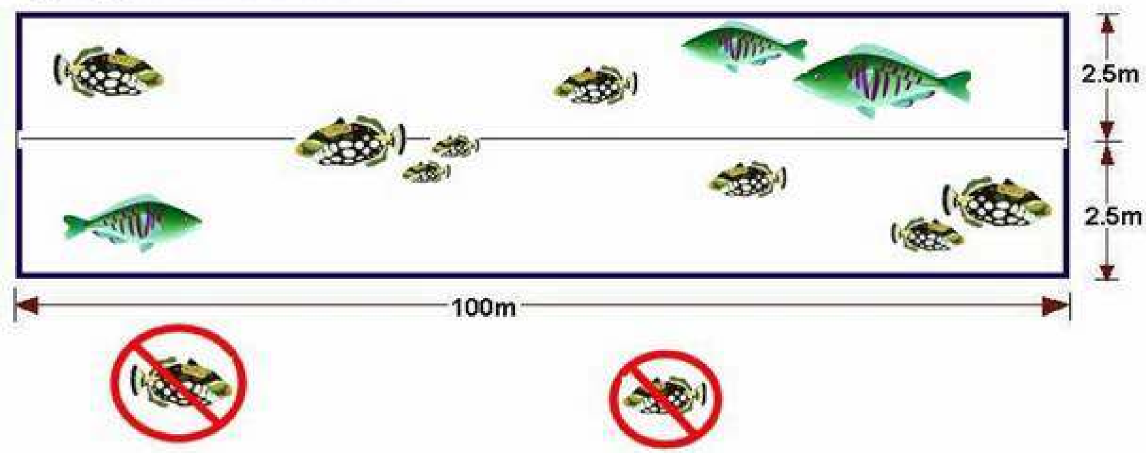
- Measuring tape, Paper, Pencil
- Bulldog clip and rubber band, Snorkeling gear

Monitoring method

1. Laying out of 100m measuring tape on desired area making sure it is done properly
2. After a lapse of 15 minutes (when divers no longer disturb the area) start counting the fish. After every five meter stops (5, 10, 15, 20m….) count the fish for 3 minutes within the 5m corridor (2.5m on either side of the meter tape) before moving to the next stop. Do not count fish outside the 2.5m sampling area. Can use full arms length (slightly shorter than 2.5m) as a guide to check on sampling boundary. Fish sizes can also be estimated.
3. One diver records fish on one side of the line followed by another on the other side. Alternatively, Diver 1 can record the first 20m segment while Diver 2 can do the second 20 m segment and so on. Care is needed to properly label slates and to avoid double counting.
4. At least two samples or indicator species can be observed and recorded:

- two in the reserve area and same two in the non-reserve area.

Fig 2.0(a): Belt transect method



SAMPLE RESULT SHEET
FISH/INVERTEBRATE BELT TRANSECTS:

Date: ____________Time: __________ Tide(H-high, L-low): __________
Indicator species: Monitoring Team: _________________
Recorder: __________________ Compass Bearing: ________________
Landmark: __________

TRANSECT 1

Stations (S)	***Number of parrotfish***	**Total**	***Number of Grouper***	**Total**
S1 (0m)				
S2 (5m)				
S3 (10m)				
S4 (15m)				
S5(20m)				
S6 (25m)				
S7 (3om)				
S8 (35m)				
S9 (40m)				
S10 45m)……				
23…..S20 (95m) Total				

B) LINE TRANSECT & QUADRAT OBJECTIVE

1. Used to determine substrate types and cover including the population of sessile marine species.

Possible Indicator Species
2. Shellfish, Trochus, Sea Cucumber, Coral health, Sand substrate

Material Preparation
3. Measuring tape, Data sheet on recording slate.
4. Snorkeling gear, Quadrat, Pencil

Monitoring method
1. Lay tape for 100 metres on reef edge
2. Lay your transect with reference to a compass reading and record reading
3. Lay the quadrat (one square metal meter) every 10m starting from 0 m
4. For marine resource monitoring
a) Count target species being monitored within the quadrat. Do not count outside the quadrat
b) Use meter tape or ruler for measuring invertebrate sizes
5. For Reef Ecosystem monitoring
a) Estimate percentage of live coral, dead coral and sand/rubble coverage
b) Estimate percentage points that make up live coral and sand within quadrat. (One meter quadrat divided by string into 100 equal squares- in each square determines which cover is dominant.

E.g. Estimating substrate cover within one quadrat

Live Coral – 32 points	Dead coral-30 points	Sand/rubble – 38 points
32/100 x 100 = 32%	30/100 x 100 = 30%	38/100 x 100 = 38%

SAMPLE RESULT SHEET
Date: High/Low Tide:
Indicator species: Monitoring Team:
Recorder:

Stations/Quad rat numbers	**TRANSECT 1**	**TRANSECT 2**	**TRANSECT 3**	**TRANSECT 4**
Comp. Bearing/ Landmark: Time				
Q1 (0m)				
Q2 (10m)				
Q3 (20m)				
Q4 (30m)				
Q5(40m)				
Q6 (50m)				
Q7 (60m)				
Q8 (70m)				
Q9 (80m)				
Q10 (90m)				

Results

The abundance of invertebrates

Results for all species and variables sampled since the first baseline survey in 2004 up to the recent monitoring in May 2007 are shown in Figures 1 – 19. Break down of the results is as follows:

- Fig 1 – Fig 8 shows the abundance of indicator Fish species identified at the sites (readings done in 2007 only),
- Fig 9 – Fig 12 shows all giant clams species identified from 2004 – 2007 and
- Figs. 13 – 18 shows the percentage coral cover of the sites monitored and is recorded only since 2007.
- Fig. 19 – Sea cucumber species observed over the last 4 year period.

Giant Clams

The overall numbers of giant clam species recorded at all the sites showed great variations between 2004 and 2007. Although T. derasa, T.gigas and H.hippoppus were recorded in 2004 and 2005 (Maravaghi, Sisili and Taburu) not an individual T.derasa was recorded in 2006 while no T.gigas or H.hippoppus were recorded in 2007.

Overall results for T. crocea showed sturdy decreases in 2005 after the baseline survey in 2004 with significant increases of up to 67 individuals with a mean of 11.16 (± 11.053) (Fig.10, 11) in 2006 before plunging down to10 individuals with a mean of 1.67 (± 2.42). T.maxima however did continue it's down ward trend from a mean of 7.2 (± 4.658) in 2004 to an all time low of 1.83 (± 2.040) in 2007, the 3rd year of monitoring.

Sea cucumbers

The overall results for sea cucumber counts also showed declines in the years after the baseline survey of 2004. In-fact there was a decline by 34.62 % during the first monitoring in 2005 and a further 23.07 % decline during the third monitoring in 2007 Fig. 19 and (table 1). This decline would be attributed to the lifting of the nation wide ban for the harvest of all sea cucumber species which was passed by Solomon Islands cabinet during the month of April, 2007 following the Tsunami that the caused havoc at the Western and Choiseul Provinces in Solomon Islands.

Trochus niloticus is one of the marine resource species most village dwellers in rural Solomon Islands depend heavily on besides fish and beche de mer for cash. This particular species showed some improvements after the baseline in 2004 and again during the recent 2007 monitoring. In 2005 only one individual was observed at Tulaghi, while Salavo recorded a total of 4.individuals with a mean of 0.667 (± 1.63) followed by a decline to 3 individual with a mean on 0.50 (± 0.50) in 2006. In May 2005 communities of Salavo harvested a total of 105 individuals of *trochus nilotichus* shells in a dive time of 55 minutes (measuring between 8 - 10cm). These were sold for a total of SBD$924.00. The harvesting was done in accordance with their Community Management Action Plan (CMAP) which was drawn up earlier with them. The harvesting was necessary as a means to avoid shells being wasted or eaten away by worms as they grow to bigger sizes. Results from successive years of monitoring showed that this particular marine species was found only at sites like Tulagi Island, Salavo and Rodrique bay, indicating these sites have the habitats that support this particular species.

Fish counts only began at the sites in Gela during this monitoring. Prior to these, communities were instructed to identify which species were to be their target or indicator species base on:

- 2 economically important species
- 2 culturally/traditionally important species
- 2 biologically important resources/species

The target fish species are identified (also applies to invertebrate indicators) together with the communities using the pair wise ranking method on pp.14 of the FLLMA Community Based Biological Training Guide. Again for the reader's convenience this can be seen in appendix.1. The species of fish identified as the communities target species are in table 3. Fish counts are done at every 5 meter intervals for 3 minutes within the 5 meter corridor (2.5m on either side of the meter tape) along a 100m x 5m transect.

DEVELOPING SMARTI OBJECTIVES/ INDICATORS

OBJECTIVE

- To understand what an indicator species is.
- To use Specific, Measurable, Achievable, Realistic, Time defined and Impact oriented (SMARTI) criteria to confirm quantifiable, time defined objectives and to determine what might be a good indicator species.

"SMART"

S- Specific

M- Measurable

A-Achievable

R- Realistic

T- Time defined

I- Impact oriented

- To identify and confirm indicator species to be monitored

METHOD

- Plenary discussion of what SMARTI stands for and define terms
- For the plan developed in session 2 note the following criteria were already met.
  - S – Specific.
  - T--Time defined.
  - I – Impact oriented (the behavior change was thought to have this impact.
- For all the proposed changes, ask in plenary whether they meet the other criteria of being easily measured (there is some overlap in the Measurable, Achievable and Realistic definitions). Record on flip chart.
- Identify indicator species by listing important species (economical, cultural and biological significance) and prioritize them through pair wise ranking.
- Ask each participants to list on a card
  - Collate them and pick out 6-10 commonly identified resources
  - Prioritize the top 10 most important species by pair wise ranking

Appendix 1. Example from Korolevu-i-wai Management planning exercise

Important Species	QARI	KANACE	DOGO	KAIKOSO	VASUA	SICI	LASE	KAWAKAWA	CAWAKI
QARI		Kanace	Dogo	Qari	Vasua	Qari	lase	kawakawa	Cawaki
KANACE			dogo	Kanace	kanace	kanace	lase	kawakawa	Cawaki
DOGO				Dogo	dogo	dogo	lase	kawakawa	Cawaki
KAIKOSO					kaikoso	kaikoso	lase	kawakawa	Cawaki
VASUA						vasua	lase	Kawakawa	Cawaki
Sici							lase	Kawakawa	Cawaki
LASE								Lase	Cawaki
KAWAKAWA									Cawaki
Cawaki									

Appendix 2

IMPORTANT RESOURCES	**Number of Appearance**	**RANKING**	**9 top most important resources**
Qari	2	7	1 – ***Cawaki***
Kanace	4	5	***2- Lase***
Dogo	4	4	***3. Kawakawa***
Kaikoso	3	6	***4. Dogo***
Vasua	2	8	***5. Kanace***
Sici	0	9	***6. Kaikoso***
Lase	7	2	***7. Qari***
Kawakawa	6	3	***8. Vasua***
Cawaki	8	1	***9. Sici***

Coral cover

Coral cover is the measure indicating the health status of any particular coral reef. The health of a coral reef therefore determines the abundance and types of marine resources species found in that particular coral reef. In determining the method used in gathering of appropriate data, the reader is once again asked to refer to FLLMA manual pp 23, 24.

The percentage cover for Tulaghi, Sisili, Maravaghi and Salavo MPA's (Figs 13, 15, 17 & 18) is highest at the control sites than at the actual MPA's, while Taburu and Rodrique Bay (Figs 14 & 16) have similar results where the percent cover for the MPA is equivalent to that of the controls. Six individual sites (Tabariki, Maravaghi, Vatulovo, Hasinagho, Vatuvavala & Raghenakau) recorded very low percentage coral covers (Figs 13,15, 16, 17) The reasons behind these are:

1. Sites often experienced mass outbreaks of *Acanthaster planci* commonly known as the "crown of thorns" starfish eg. Maravaghi MPA.
2. sites where most of the corals for the 'curio trade" have been harvested from eg. Raghenakau (control for Taburu) & Hasinagho (control site for Rodrigue),
3. sites where dynamite fishing is still being practiced at eg. Tabariki (control site for Sisili) & Raghenakau (control site for Taburu). This was witnessed during the last monitoring (May 2007).

Fish abundance

Parrot fish was recorded at 17 sites out of the 18 sites that were monitored with a total of 561 individuals. Butterfly fish was recorded at 16 sites, with a total of 142 individuals after surgeon fish. Table 2 & (Fig. 8)

The most abundant target fish species encountered at any one individual site (Tabote) during this recent monitoring was surgeon fish (Fig. 3) with a total of 144 individuals Table 3. This particular target fish species is recorded at 13 sites and ranks second to parrot fish, with an overall total of 344 individual. (Table 3)

The least recorded target species was emperors with a total of 11 individuals. Taburu MPA only recorded one target fish species (Parrot fish) while Raghenakau did not record any fish at all. It can be concluded here that the reason for this would the fact there was very little coral cover. (See discussions on Coral cover).

DISCUSSION

The main expectation of this monitoring study is to be able to detect change in realistic increase in abundance and size of commercially important invertebrates and fish over time and at spatial scales. This is because: (1) low abundances were found prior to MPA declaration and (2) similar levels of variabilities in the MPA and reference areas.

The Gela populace, like the rest of Solomon Islands, live on or near the coast. The scarcity of good agricultural farm land (land based income generating activities) coupled with the fast growing population, access to efficient modern fishing gears (e.g. monofilament gillnets, waterproof torch lights, underwater breathing gears like SCUBA and Hookar, dynamites and chemicals) and the high prices attached to many marine resources (e.g. grade A white teatfish beche-de-mer is currently fetching SBD230.00 per kg in Honiara), has forced many coastal dwelling people to rely heavily on marine resources for their livelihood. This is indeed a very conducive situation for a fast decline and eventual short supply in most depended marine resources.

Giant Clams

Looking through the data (2004 – 2007) for all sites in Gela, some of the species have still not fully recovered, thus by 2007 (third year after the MPA's were established), species like *Tridacna derasa, Tridacna gigas, Hippopus hippopus* were still not observed. Species like *Tridacna crocea, Tridacna maxima and Tridacna squamosa* showed a lot of fluctuations which indicates several reason:

- pouching must have occurred
- there were no permanent markers to show the exact positions for the line transects to be laid

- discrepancies in data recording
- situations during the time of monitoring (strong currents, high and low tide, change in people doing the monitoring, change in monitoring techniques)

Beche de mer

The beche-de-mer fishery is a multi-million dollar (SBD) industry in Solomon Islands. It's contribution to the national foreign earnings is second to the lucrative tuna and it is the second largest source of income to coastal communities from inshore marine resources (Ramofafia 2004). The fact that all beche-de-mer species can be sold for money let alone the attractive prices they carry, coupled with their inability to escape compared to fish, makes it very vulnerable to being over-fished.

Average buying prices for beche de mer at the Honiara markets varied according to the different species. Kinch 2004 reported that white teatfish (*Holothuria fuscosgilva*) prices ranged from SBD$110.00 (grade D) to SBD$270.00 (grade A) while the lowest value beche de mer, orangefish (*Pearsonothuria graffei*) was selling at SBD$12.00 per kg. Table 5, compared to copra with is buying price ranging from a mere SBD$1.90 - $2.00. These attractive prices have indeed lead to the fast decline in all sea cucumber species which has truly reflected in the results from this and previous monitorings. Table 1 & Fig 19. Some sea cucumber species like greenfish (*stichopus chloronotus*) are said to be very slow in their recruitment and for the last 4 years not a single individual was spotted, indicating that this particular species has indeed been heavily fished out more than the other species.

RECOMMENDATIONS

Install permanent pegs using reinforced re-bars to indicate exact positions for lying of transects. The FLMMA method of using land marks can be proved to be inconsistent as land marks can be removed or destroyed by unfavorable weather conditions.

The monitoring methods used should be subjected to the types of organisms or marine resources identified by communities as their indicator or target species. The reason being that certain species such as *trochus niloticus* are only located at the fringing reefs and not on reef flats or on coral rubble.

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Rodrigue Bay village Chief and Community,

Salavo village Chief and Community

Dala village Chief and Community

Leitongo 1 and 2 village Chiefs and Communities

Maravaghi Resort owner and Community

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Table 1. Total sea cucumber species counts over the last 4 year period.

2004		2005		2006		2007	
No. of Individuals	Species found	No. of Individuals	Species found	No. of Individuals	Species found	No. of Individuals	Species found
26	white teat, tiger fish, curry fish, lolly fish, P.graffei	9	Tigerfish, Lollyfish P.graffei	12	Prickly red, tigerfish, lollyfish, Pinkfish	6	White teat, Prickly redfish Tigerfish lollyfish

Table 2. Total giant clam species counts over the last 4 years

Species	2004	2005	2006	2007
Tc	49	33	67	10
T.m	36	30	26	11
T.s	7	5	17	4
T.d	1	2	0	2
T.g	2	1	5	0
H.h	2	18	13	0

Table 3. Target fish species observed at sites during monitoring

Sites	Emperor	Butterfly	Parrot	Surgeon	Rabbit	Trevally	Angel
Sisili	2	21	96	19	0	0	7
Tanaumu ©	7	9	5	4	0	0	0
Tabariki ©	0	8	8	0	4	3	0
Tulagi	0	9	7	0	0	0	0
Hasilau ©	0	6	86	9	36	0	0
Nurosule ©	0	13	26	8	6	7	0
Maravaghi	0	24	44	43	1	0	0
Tabote ©	0	14	83	144	0	0	2
Vatuvavala©	0	2	12	9	0	0	0
Taburu	0	0	8	0	0	0	0
Barana ©	0	3	10	0	0	0	0
Raghenakau©	0	0	0	0	0	0	0
Rodrigue	2	5	35	32	2	0	0
Paupau ©	0	7	20	5	0	0	2
Asinagho ©	0	2	7	7	2	0	0
Salavo	0	3	35	25	0	83	0
Adeselana ©	0	8	25	11	0	0	1
Talolose ©	0	8	54	28	0	0	4
Total	11	132	561	344	51	93	16

© - control site

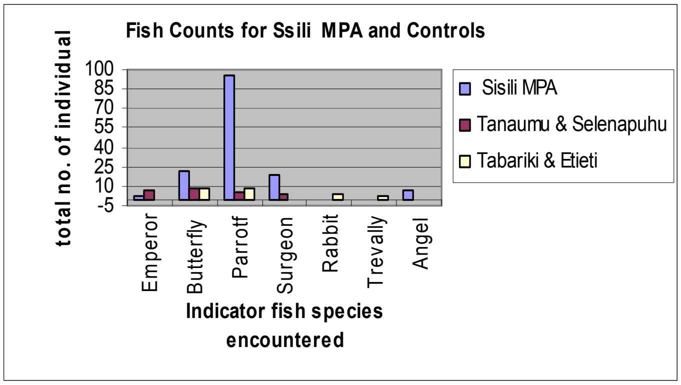


Fig. 1

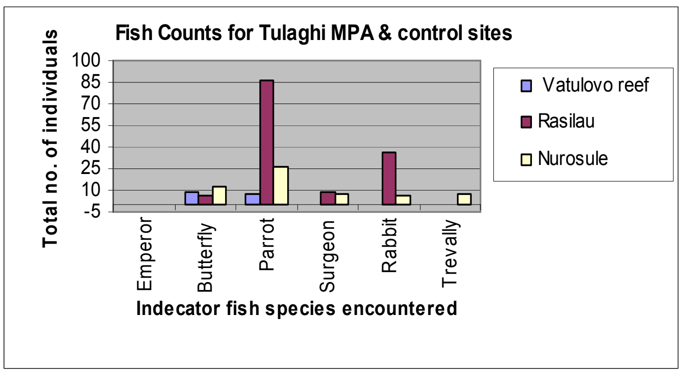
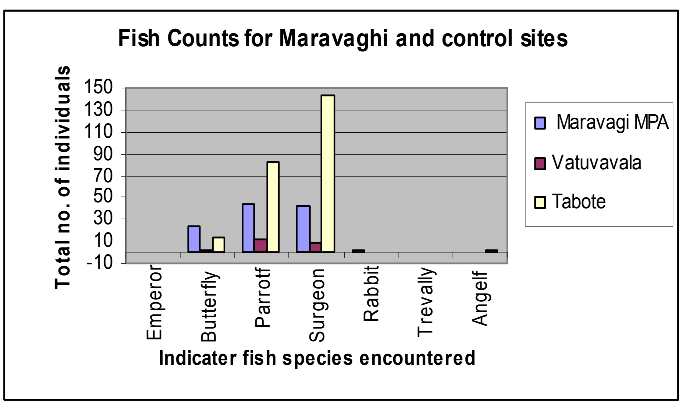


Fig.. 2



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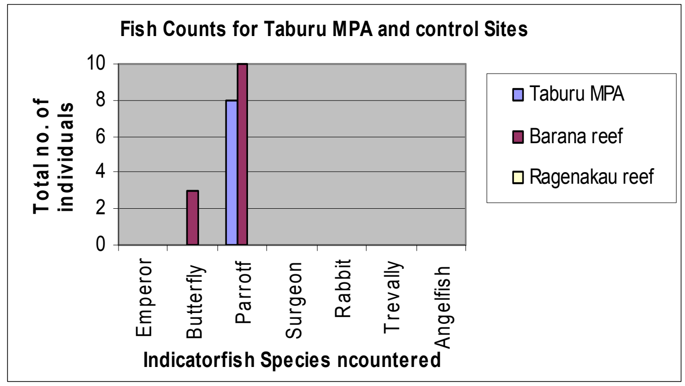

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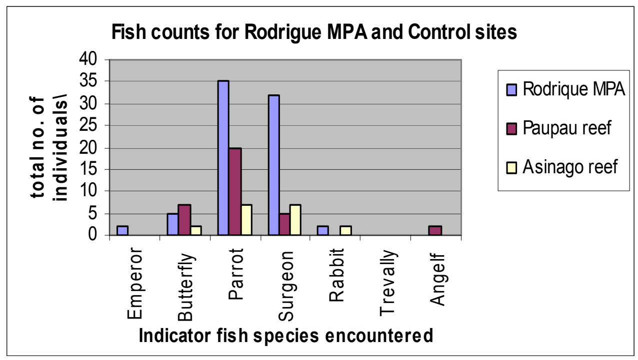

Fig. 5

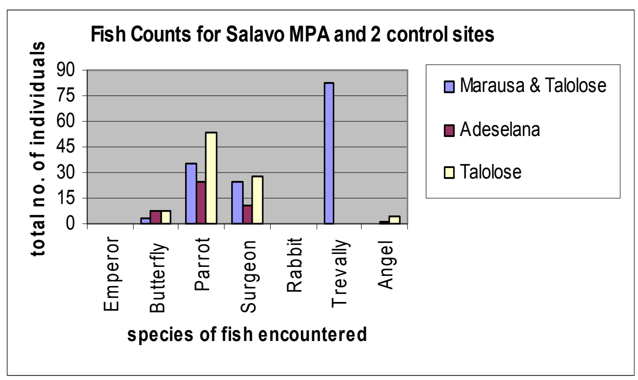

Fig. 6

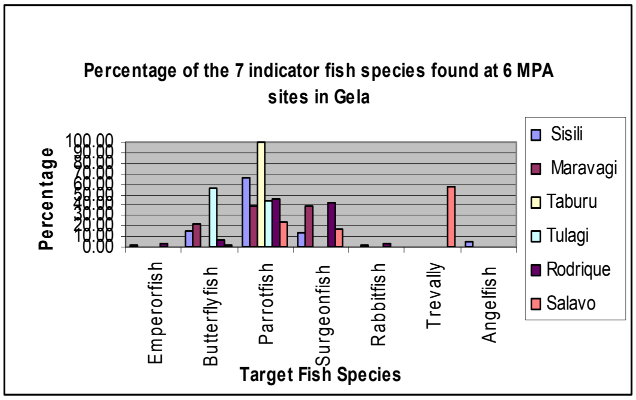

Fig..8

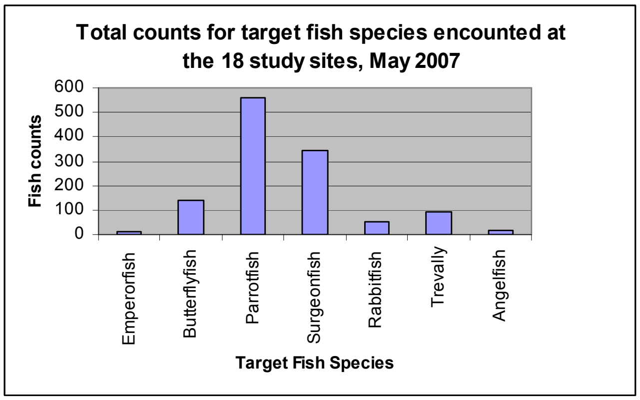

Fig 7

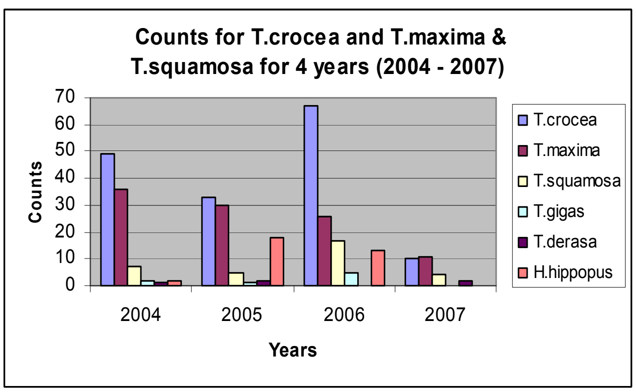

Fig. 9

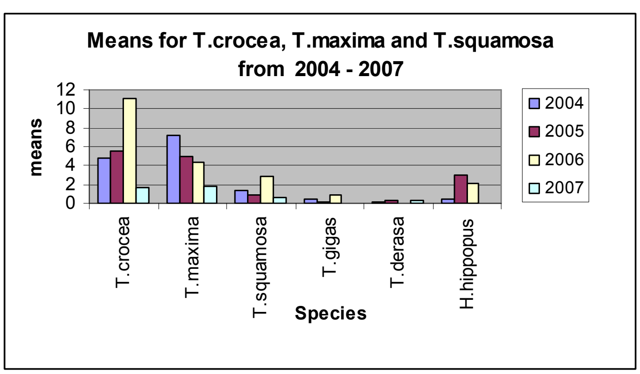

Fig. 10

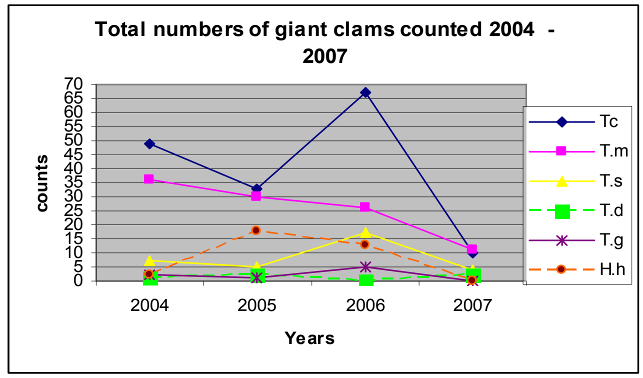

Fig 11

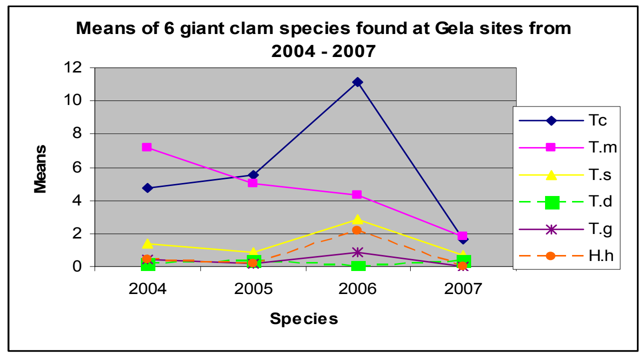

Fig. 12

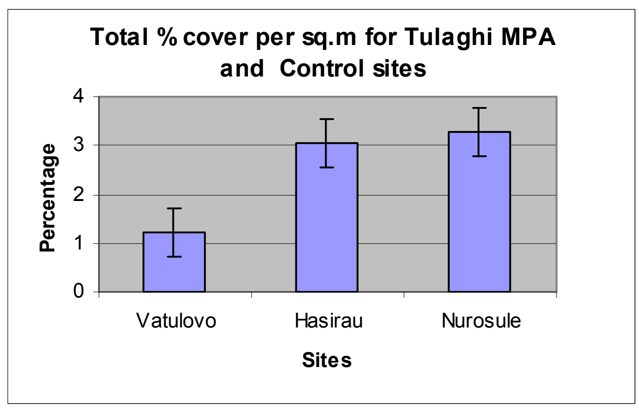

Fig 13

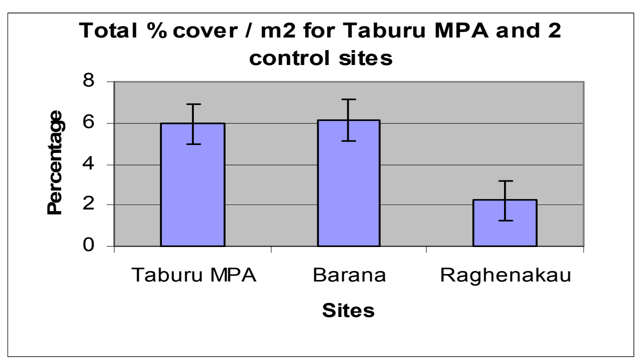

Fig 14

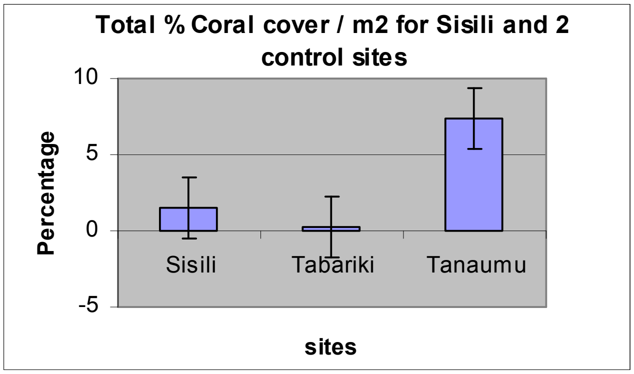

Fig 15

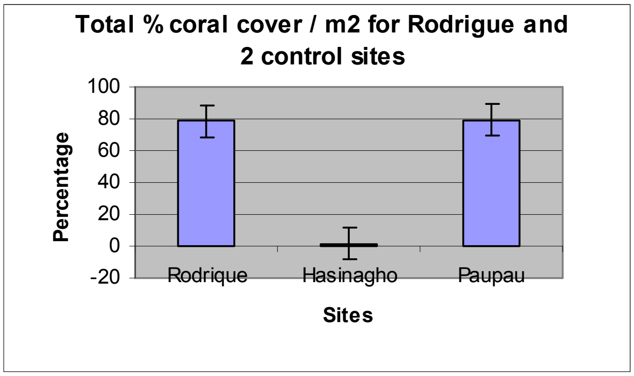

Fig 16

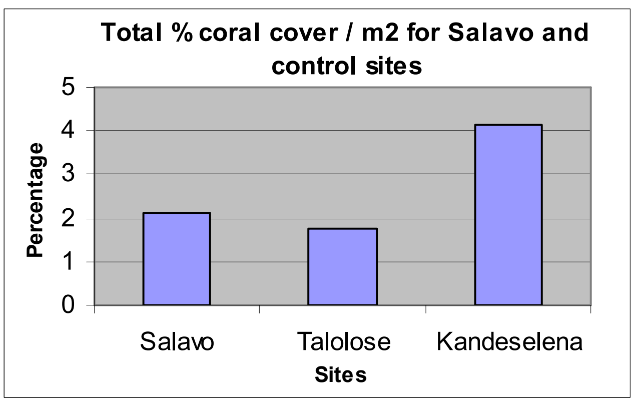

Fig 17

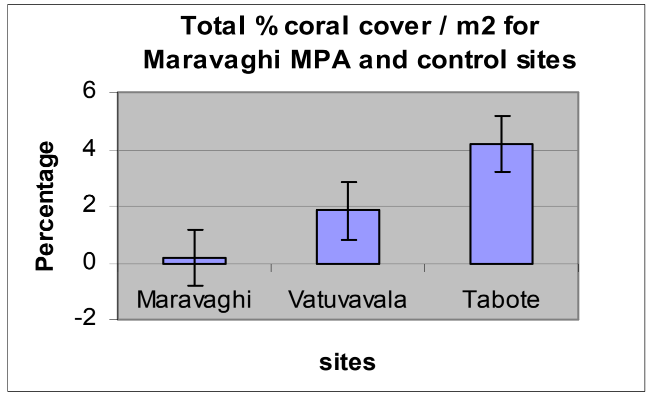

Fig 18

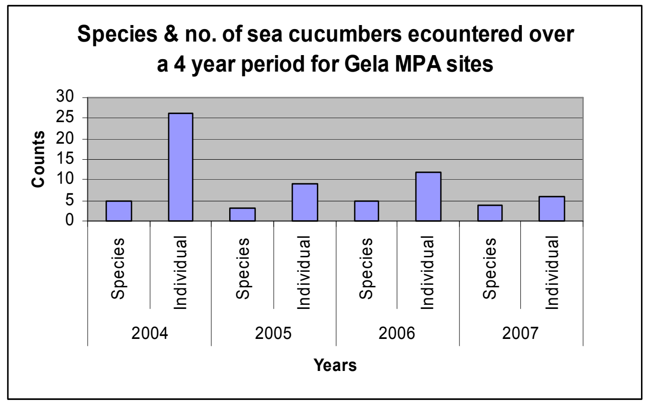

Fig 19

Table 4: Invertebrate species studied during this monitoring.

TAXA	COMMON NAME	SPECIES
Sea cucumbers	Deepwater redfish	*Actinopyga echinites*
Sea cucumbers	Stonefish	*Actinopyga lecanora*
Sea cucumbers	Surf redfish	*Actinopyga mauritiana*
Sea cucumbers	Blackfish	*Actinopyga miliaris*
Sea cucumbers	Tiger/Leopardfish	*Bohadschia argus*
Sea cucumbers	Chalkfish/false Teatfish	*Bohadschia similes*
Sea cucumbers	Brown sandfish	*Bohadschia vitiensis*
Sea cucumbers	Lollyfish	*Holothuria atra*
Sea cucumbers	Snakefish	*Holothuria coluber*
Sea cucumbers	Pinkfish	*Holothuria edulis*
Sea cucumbers	White Teatfish	*Holothuria fuscogilva*
Sea cucumbers	Elephant’s trunkfish	*Holothuria fuscopunctata*
Sea cucumbers	Black Teatfish	*Holothuria nobilis*
Sea cucumbers	Sandfish	*Holothuria scabra*
Sea cucumbers	Orange/flowerfish	*Pearsonothuria graeffei*
Sea cucumbers	Greenfish	*Stichopus chloronotus*
Sea cucumbers	Dragonfish (Peanutfish)	*Stichopus horrens*
Sea cucumbers	Curryfish	*Stichopus hermanni*
Sea cucumbers	Brown curryfish	*Stichopus vastus*
Sea cucumbers	Prickly redfish	*Thelenota ananas*
Sea cucumbers	Amberfish	*Thelenota anax*
Sea cucumbers	Lemonfish	*Thelenota rubralineatus*
Pearl Oysters	Gold lip pearl oyster	*Pinctada maxima*
Pearl Oysters	Blacklip pearl oyster	*Pinctada margaritifera*
Pearl Oysters	Brown pearl oyster	*Pteria penquin*
Giant clams	Giant clam	*Tridacna gigas*
Giant clams	Smooth giant clam	*Tridacna derasa*
Giant clams	Fluted giant clam	*Tridacna squamosa*
Giant clams	Rugose giant clam	*Tridacna maxima*
Giant clams	Burrowing giant clam	*Tridacna crocea*
Giant clams	Horseshoe clam	*Hippopus hippopus*
Bivalves	Romu	*Chama pacifica*
Bivalves	Ke’e	*Berguina semiorbiculata*
Bivalve	Kurila	*Atrina vexillum*
Snails	Trochus	*Trochus niloticus*
Snails	False Trochus	*Pyramis tectus*
Snails	False Trochus	*Trochus maculates*
Snails	Greensnail	*Turbo marmoratus*
Snails	Triton*	*Charonia tritonis*
Starfish	Crown of Thorns*	*Acanthaster planci*

* Indicator species coral reef health

Table 5. Current local buying prices (per kg dried weight) for selected beche-de-mer species from Solomon Islands (April-June 2004). Honiara buying prices were from Kinch (2004) and Gizo buying prices from three local buyers. L = large, S = small.

		Current Buying Price (SB$) per kg			
Common Name	Grading	Honiara	Gizo 1	Gizo 2	Gizo 3
White teatfish	A	270	220	220	230
	B	230	180	180	180
	C	150	120	160	130
	D	110			80
Greenfish		200		200	165
Sandfish	A	200	150	140	165
	B	100	93	70	80
Curryfish		185	160	162	165
Peanutfish		185	160	165	165
Prickly redfish		185	160	165	165
Stonefish		185	155	162	160
Blackfish		180		160	130
Surf redfish	L	170	155	160	150
	S	80			60
Black teatfish	A	150	120	125	130
	B	100	100	100	80
Brown sandfish		70	65	65	65
Tigerfish (leopardfish)			60	65	65
Amberfish		45	38	45	40
Snakefish		40	35	35	40
Brown sandfish 4		35	35	40	40
Elephant's trunk fish		35		45	25
Chalkfish		30	28	28	25
Lollyfish	L	30	22	30	25
	S	20	12	15	15
Pinkfish		30	28		25
Snakefish red		30		42	25
Snakefish white					
Ripplefish		30	12	15	20
Deep water redfish					
Hongpai fish		25	25		25
Lemonfish		25	18		25
Orangefish			12		20

Table 5a: A general description of the sampling sites

SHALLOW AND DEEP HABITATS		
Locality	**Site**	**Site Description**
Sisili MPA	S1	Sheltered reef terrace next to Sisili settlement
Tanaumu /		Sheltered reef terrace next to Sisili settlement to the north
Selanapuhu		Sheltered reef terrace north of Tanaumu reef
Ulunagho		Sheltered reef terrace next to Sisili settlement to the south
Tabariki		Sheltered reef terrace next to Ulunagho settlement to the south
Taburu MPA	S2	Sheltered reef terrace next to Taburu settlement
Barana		Sheltered reef terrace next to Taburu MPA to the west
Raghenakau		Sheltered reef terrace next to Taburu settlement to the north east
Rodrigue Bay	S3	Protected reef terrace in the Rodrigue bay close to the World Discoverer wreck.
Paupau		Protected reef terrace in the Rodrigue bay close to the World Discoverer
Hasinagho		Protected reef terrace and slope in the Rodrigue bay close to the World Discoverer
Maravaghi MPA	S1	Sheltered reef terrace in front of Maravaghi Resort.
Tabote	S2	Reef terrace directly south of Maravaghi Resort.
Vatuvavala	S3	Exposed reef terrace to the north of Maravaghi Resort and MPA.
Tulagi Island	S4	Sheltered reef terrace on the eastern side of Tulagi island
Hasirau		Sheltered reef terrace north west Tulagi MPA
Nurosule		Sheltered reef terrace south east of Tulagi island

Table 5b: Latitude and longitude for each sampling site, measured using a Global Positioning System (GPS)

LOCALITY	SITE	LAT. (South)	Long. (East)
Sisili MPA	S1	09° 00.01.86’	160°06.12.20’
Tanaumu /	S2	08 59 53.79	160 06 12.80
Selanapuhu		09 59 47.07	160 06 07.39
Ulunagho / Tabariki	S3	09 00 11.43	160 06 15.20
Taburu MPA	S2	09° 00.16.83 ’	160°04.52.33’
Barana	S2	09 00 13.45	160 04 43.35
Raghenakau	S3	09 00 04.89	160 05 05.38
Rodrigue Bay	S1	09° 01.36’	160°07.60’
Paupau	S2		
Hasinagho	S3		
Maravaghi MPA	S1	08° 57.04.54’	160°03 32.06’
Vatuvavala	S2	08° 56 40.93’	160°03.30.87’
Tabote	S3	08 57 12.19	160°03.21.70’
Tulagi Island	S1	09° 02.05.55’	160°06.16.70’

Hasirau	S2	09 01 49.27’	160 06 00.45’
Nurosule	S3	09 02 17.13’	160 06 29.03’

Table 6: List of trained community representatives who were involved during this monitoring

Name	MPA Represented and Village
Joseph Keba	VDW - Ngella communities
Francis Durai	Sisili MPA – Leitongo
Simon Suba	Taburu MPA – Leitongo
Stephen Tarunga	Maravaghi MPA – Maravaghi Resort
James Pitia	Marausa MPA - Salavo
John Sukoku Jnr	Vatulovo MPA - Tulaghi
Paul Sara	Rodrigue Bay MPA