CORAL TRIANGLE INITIATIVE
ON CORAL REEFS, FISHERIES AND FOOD SECURITY

PAPUA NEW GUINEA

IABAM & PAHILELE COMMUNITY BASED RESOURCE MONITORING PROGRAM SURVEY REPORT #: 8

MONITORING PERIOD: OCTOBER 2012

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Iabam & Pahilele Community Based Resource Monitoring Program
Survey Report #: 8
Monitoring Period: October 2012

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IABAM & PAHILELE COMMUNITY BASED RESOURCE MONITORING PROGRAM

SURVEY REPORT #: 8
MONITORING PERIOD: October 2012

Monitoring Report Written by Jameson Solipo
(Iabam-Pahilele CMMA Data Specialist)

PREFACE

Thank you all the members of Iabam and Pahilele CMMA and to our other readers for reading and keeping track of what has been happening inside Iabam and Pahilele Islands. Monitoring of marine resources within our ward is not an easy exercise to carry out as it is based on voluntary participation on behalf of resource owners and users of the mentioned islands.

Monitoring programs such as this are often costly to implement at a community level however; we have been a fortunate community to have Conservation International supporting our local initiatives and the funding from the USCTI and CTSP in ensuring our resources are managed by locals ourselves using skills, knowledge and financial assistance provide to our CMMA.

I sincerely thank Conservation International for their continuous support and look forward to getting my committee members work very closely with their staff to develop and attain skills and knowledge they have to offer for best management of our marine resources.

I also thank those who have participated in this monitoring and commend you for your time and effort in ensuring this monitoring was a success.

Mr. Terry Abaijah

Chairman
Iabam & Pahilele CMMA

ABOUT THIS REPORT

This October monitoring report only provides the result for what was recorded during that monitoring period and does not provide any trend in species occurrence and/or abundance. Population trend for species abundance and occurrence will be provided in the December monitoring report.

1. INTRODUCTION

It is now the second year of our community based monitoring program which our community have conducted a total of 8 monitoring between a space of 22 months. Our monitoring report is conducted every 3 months within 1 calendar year. The results that are gathered in each monitoring periods often vary or fluctuate a little however; what we would want to see in a long run is the trend in each indicator species that we have been monitoring. The trend can be determined yearly by analyzing all data and making comparisons among respective years. Only a long term, continuous effort can reveals if our resources are replenishing or are declining.

2. METHODS

2.1. Field Data Collection

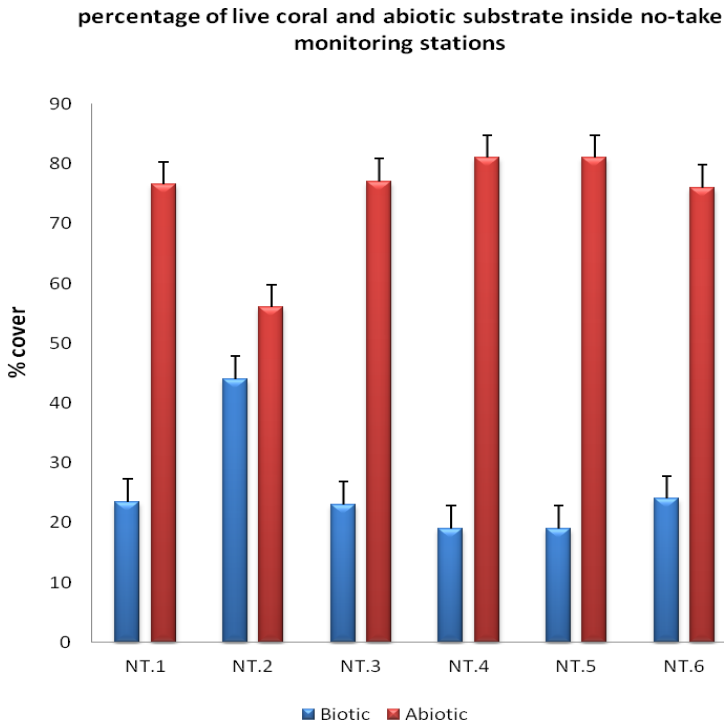
Monitoring methods used was the same as those used previously. Logistics such as boats were hired locally on a dry weight hire whereby fuel was supplied by Conservation International.

2.2. Data analysis

All pre-analyzed data from the field were brought down to Alotau and were processed by Mr. Solipo. The information analyzed was converted into graphs and other visual presentations which were then used in this report.

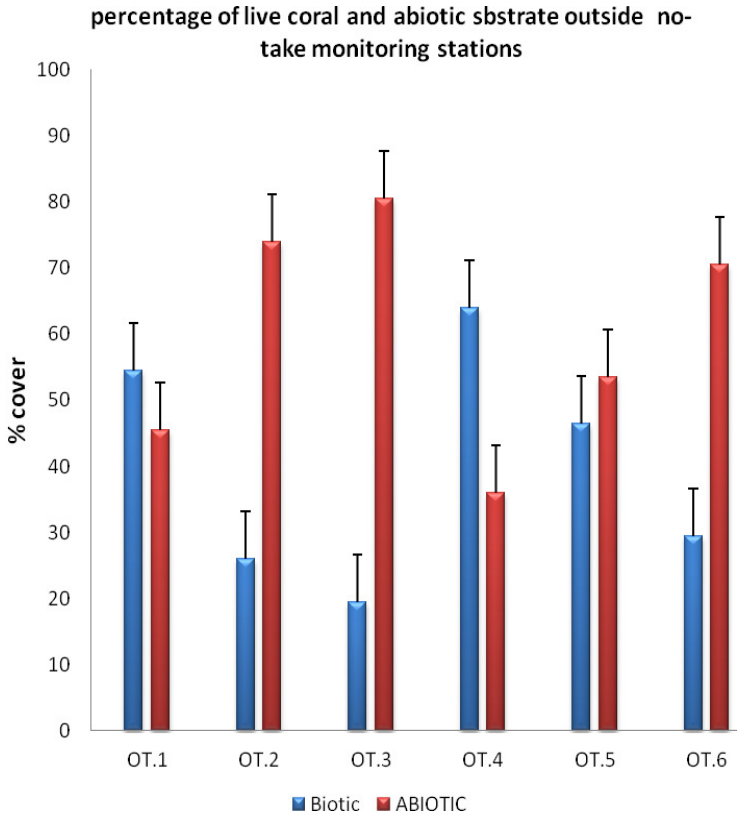
3. RESULTS

3.1.1 Benthic substrate for reefs inside no-take



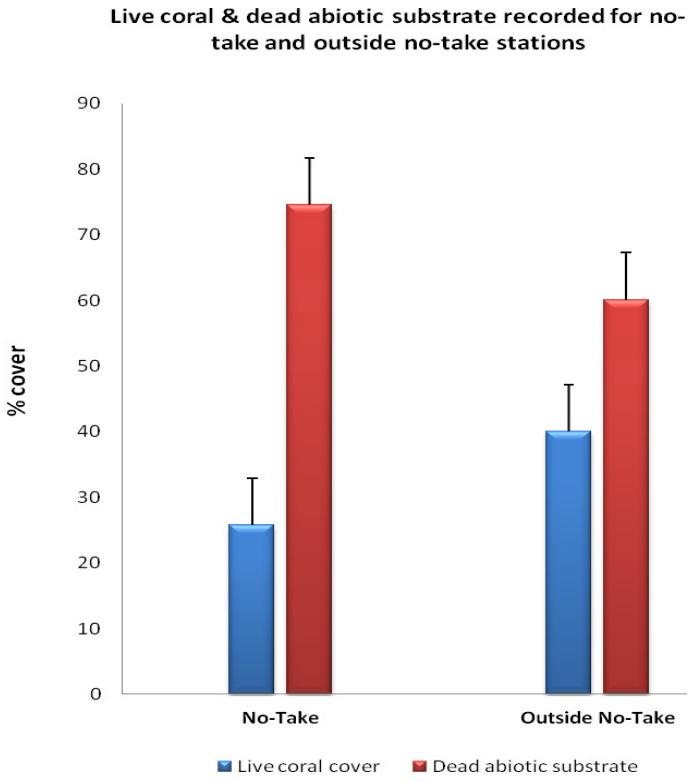
Benthic substrates for sites inside no-take in this monitoring indicate high abiotic substrate inside all monitoring stations. Sites with very high abiotic substrate composition include Dana Gedu (88.5%); Siasialina (77.5%); Banibani Siga (70.5%) and Hanakubakuba (66.5%). Live coral cover recorded on average was at Tawali Namonamo (51.5%). The live coral type that showed dominance at Tawali Namonamo were Acropora branched corals (20%) and those with submassive structures particularly Acropora and Pocillopora both making up 20% as well. Then highest abiotic substrate recorded at Dana Gedu (NT.3) was hard bed rock substratum which comprised 59% of all substrates in that monitoring transact.

3.1.2. Benthic substrates for reefs outside no-take areas



The monitoring station outside no-take Tawali Balabala recorded high live coral cover with (64%) corals respectively. Branching Coral (BC) is the popular coral dominated highest with (58.5%) coral cover. Iabam (NW) also having high distribution of live corals along the transact at (54.5 %) coral cover and Hanakubakuba Island (46.5 %) live coral. Pahilele (SE) monitoring station having high abiotic substrate for (80.5 %). Iabam (East) and Kiwakiwalina mainly having (74 %) and (70.5 %) abiotic substrate were developed by Rock substratum (RK) and (DCR) Dead Coral Rubble along the transact.

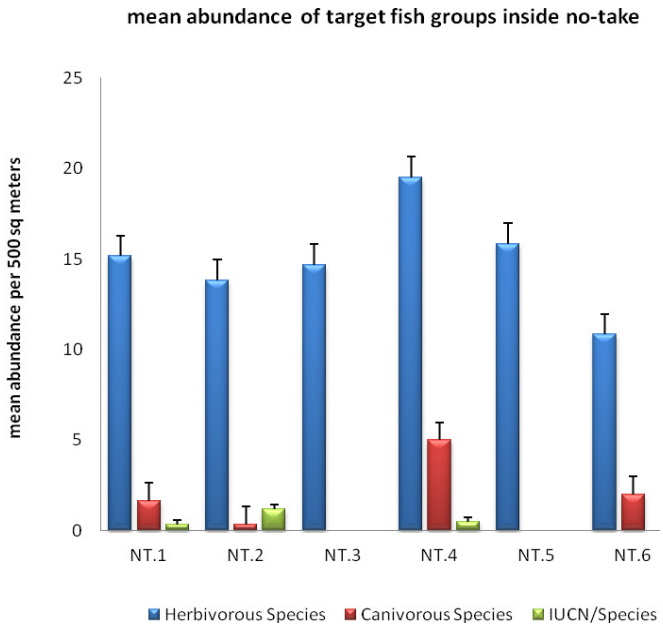
3.1.3. Benthic substrates for monitoring stations inside and outside no-take combined



The comparison graph of both monitoring stations inside and outside no-take areas indicate that inside no-take monitoring stations had low live coral cover. But mostly this survey discover's coral cover only (25.75 %) and (74.5 %) dead abiotic substrate for all no-take areas. Distribution of live coral cover within the 6 monitoring stations outside no-take showed (40 %)coral cover and dead substrate comprised (60 %) for the respective sites.

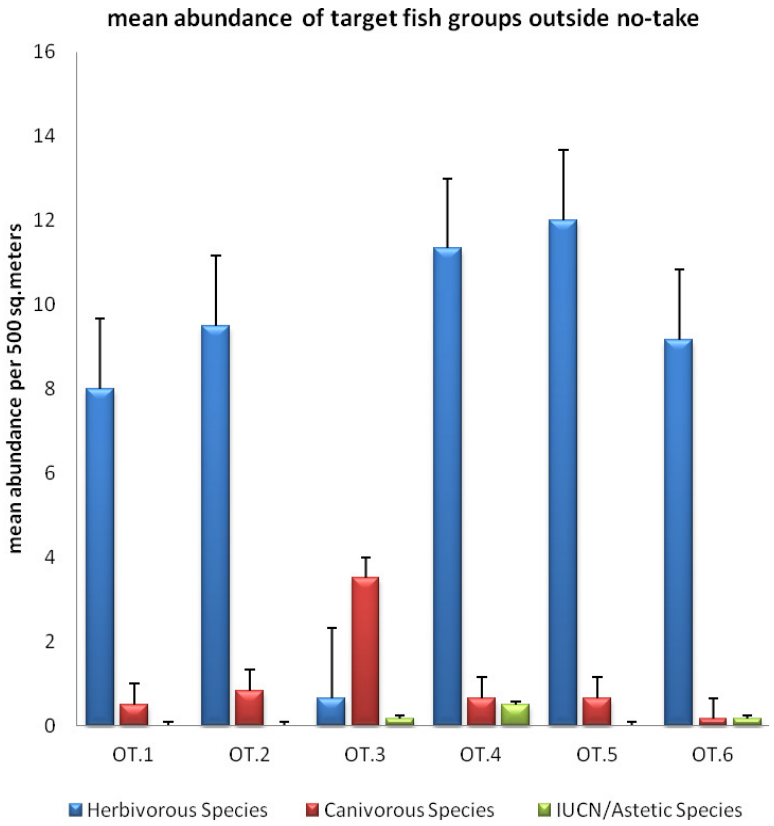
3.2 REEF FISH INDICATORS INSIDE & OUTSIDE NO-TAKE AREAS

3.2.1. Target Reef Fish indicators inside no-take



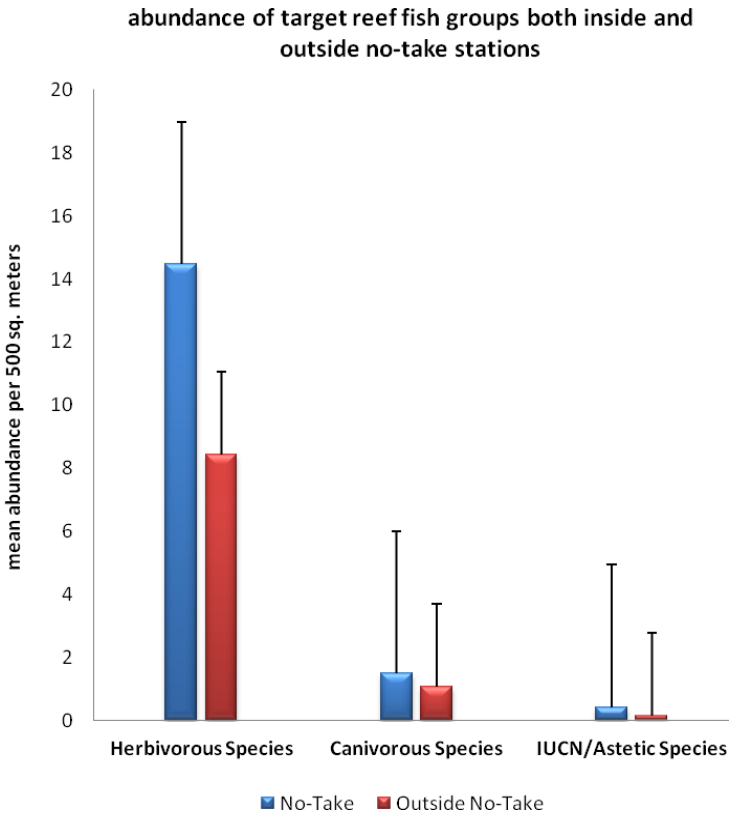
Population of herbivore fish species was recorded highest at Siasialina (NT.4) recording an average of 19.5 herbivore per 500m^2. Other monitoring stations also showed that population of herbivore fishes was higher than all other target fish groups (i.e. carnivore and IUCN/aesthetic species) Herbivorous fishes recorded at Hanakubakuba Island (NT.5) was 15.85 herbivore/500m2 while Tawali Namonamo (NT.1) recorded 15.16 herbivore/500m^2 and the monitoring stations Dana Gedu (NT.3) and Luluwalagena (NT.2) recorded 13.83 herbivorous and Banibani Siga (NT.6) recording mean of 10.83 herbivorous 500m^2. Meanwhile the carnivorous fish recorded very low abundance inside the 6 monitoring stations. Siasialina recorded an average count of 5 canivorous per 500m^2 while the other stations were low. Records for IUCN/aesthetic species show presence at Luluwalagena 1.16 species while the other stations have low and other stations without a record.

3.2.2 Target reef fish monitoring indicators outside no-take



Population of herbivore fishes appeared to be low for many monitoring stations inside no-take and outside. An average record of 8.44 was recorded for herbivore fish group per 500m^2 sampling area. Highest average per individual site reccorded was at Manikutu (OT. 5) with 12 herbivore fish/500m^2. Tawali Balabala had the second highest individual reccord with an average of 11.3 herbivore/500m^2. Other monitoring stations recorded lower values than the two mentioned sites. The lowest record out of all sites was from labam (east) with an average of 0.66 herbivore/500m^2. Population of carnivore fishes captured inside each monitoring stations was also low with an overall average of 1.05 carnivore fish/500m^2. Pahilele (southeast) monitoring station had the highest counts with means of 3.5 carnivore fish/500m^2. All other monitoing stations had very low abundance with low average of <1.0 carnivore/500m^2. Very similar result as that seen for carnivore fishes was again displayed by IUCN/aesthetic species.

3.2.3. Mean abundances for target monitoring fishes inside & outside no-take areas combined



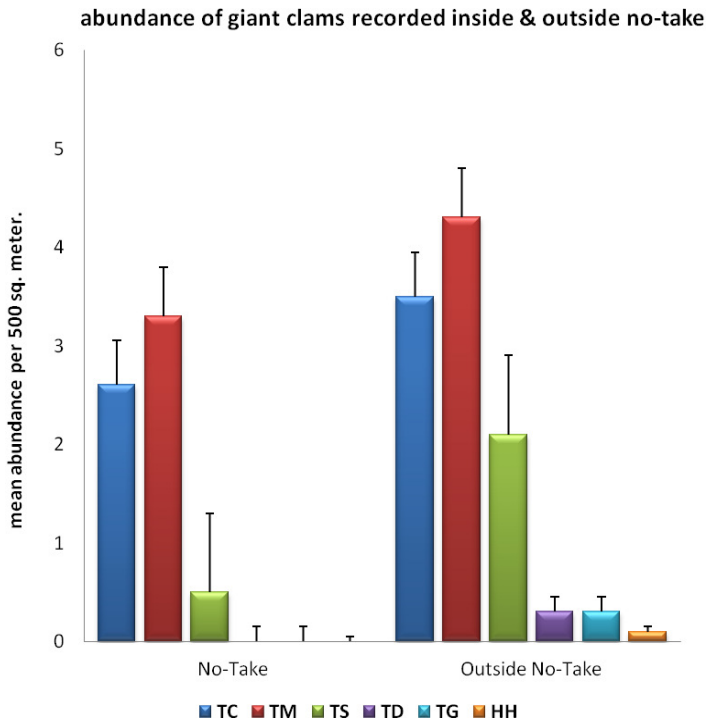
Site comparisons for the different target species inside no-take and outside no-take clearly show that herbivore fishes continue to show dominance over the other two fish groups. Despite being seen to having high bars on the graph, the actual average for both no-take and outside no-take was much lower than what was recorded in the previous July monitoring period. A low average of 14.46 herbivore/500m^2 was recorded for 6 stations inside no-take while an average of 8.44 herbivore/500m^2 was recorded for stations outside no-take. Population counts for carnivore fishes were also very low in comparison to what was recorded in July. The same applies to IUCN/Aesthetic species, recording very low averages in all 12 monitoring stations both inside and outside no-take. In general, there appeared to be a signification decline in population numbers for all target fishes when we compare the averages for those recorded in the July monitoring period with results from this monitoring period.

3.3 MARINE INVERTEBRATE

3.3.1. Sea cucumber

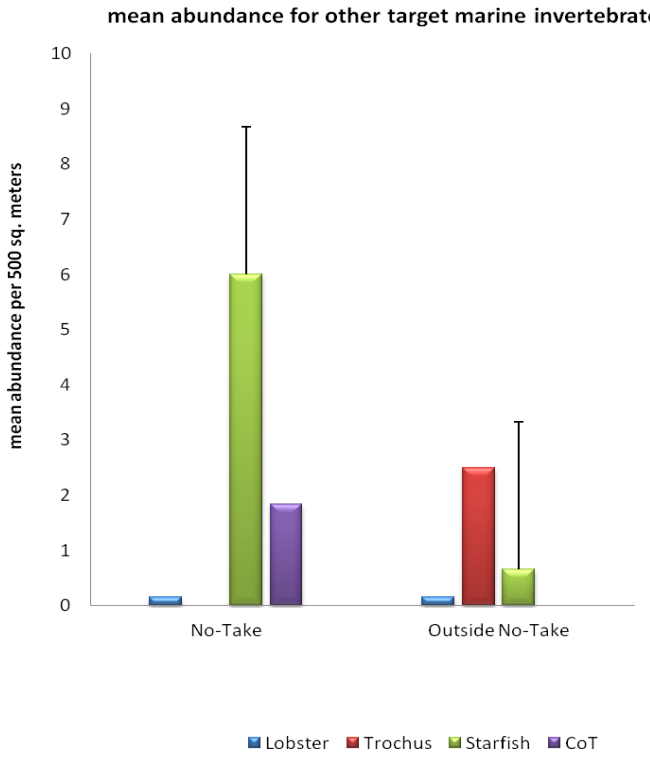
It was unfortunate that there was no records for any sea cucucumber in any monitoring stations inside and outside no-take areas. As a result of this we cannot be able to show any graph and/or graphic representation of this absence.

3.3.2. Giant Clam



There was low averages for all giant clam spcies. The most common clam species that are often found in large numbers have always been the boring shell (TC) and the maxima clam (TM). In this assessment it was observed that TS had an high average of 4.3 TS/500m^2 in the monitoring stations outside no-take and 3.3 TS/500m^2 inside no-take areas. TC recorded the second with 3.5 TC/500m^2 for sites outside no-take and 2.6TC/500m^2 inside no-take areas. There were a few records for TS with averages abundance of 2.1 species/500m^2 and 0.5 species/500m^2 for sites inside no-take. The other clam species had very low population numbers in both no-take and outside no-take areas.

3.3.3. Other Marine sedentary resources (Lobster, trochus crown-of-thorn starfish)



Mean abundance for these monitoring species (lobster, trochus, starfish & crown-of-thorn starfish) both all showed low mean values both inside and outside no-take. Thus, starfish *Linckia lavigata* was the only organism that had high distribution with an average of 6.0 species/500m^2 for all 6 monitoring stations that were inside no-take, and an average of 0.66 for all stations outside no-take. There were records of trochus shells with mean abundance of 2.5 species/500m^2 for stations outside no-take. Crown-of-thorn starfish had a mean of 1.83 species/500m^2 for the 6 stations inside no-take.

4. DISCUSSION

4.1. Benthic substrate

Dead corals and abiotic substrates like hard bedrock, sand and coral rubble continue to dominate many reef areas. Reefs along the continental shelf as well as patch and barrier reefs have varying degree of live coral cover. Some reefs have high coral growth densities while others have sparse distribution and abundance and others do not have any at all. Many factors contribute to these visual displays we see on our reefs. An environment that is conducive for coral growth has often been seen to having an array or different species and morphologies of corals. An environment that is not conducive may not have many species

but only those that have the survival capabilities and resistance to withstand levels of environmental stress.

The reefs surrounding Iabam and Pahilele CMMA as well as Nuakata Islands have been described countless times in previous monitoring reports as being near pristine as a result of very low anthropogenic wastes and limited human activities on reefs. These reef systems have always provided for local peoples' sustainable livelihood for many years and have continued to do so if it managed in a proper manner that its biological components including natural spawning and breeding cycles for corals, fishes, sea cucumber, clam and many other organisms are observed and respected. The resource management efforts now undertaken by the Iabam and Pahilele are a positive step toward this and results from these will not happen overnight but will take time. It is also good that the local members of these island communities now do monitoring to find out the status and performance of their marine environment as they continue to manage for the long term benefits of its people.

The results generated from this monitoring program cannot give you overnight results on coral health or reef conditions but can only be determined over a period of time. The distribution and occurrence of coral cover and abiotic substrate recorded for this monitoring is very similar to that recorded in July 2012 monitoring period. There was only a slight decrease in the percentage of live coral cover from 31.3% (recorded in July) to 25.3% (recorded in this monitoring). The decrease of 6% attributes to placement of monitoring transact during each monitoring program. It should be noted that never at anytime should a transact lie on an exact spot by which coral substrates are recorded the same way as it was in previous monitoring program. An important element to note is that data may fluctuate but maybe within (+/-10%). Should any difference occur as a result of two or three successive monitoring then a biological and/or physical explanation can be provided.

Other observations by local community monitors noted that there were evidence of new coral recruitment in many reefs inside/outside no-take and other areas. The successful settlement of coral larvae as well as their attachment to substrate and growth all show positive signs of coral recovery on the reefs they observed. For the sites inside no-take, Luluwalagena (NT.2) appeared to have high coral cover with 44% which featured submassive corals (SMC) contributing 19% which was made up of Acropora and Pocillopora species. Branched corals (BC) also recorded 13% among all live corals and abiotic substrates distributed in the sampling area. Other sites inside no-take recorded lower than 25% live coral cover. Monitoring stations outside no-take provided Tawali Balabala (OT.4) with high coral cover of 64% which was dominated by branching corals (BC) recording 58% of the total study area. Second to this site was Iabam NW (OT.1) with a record of 54.5% that comprised entirely of soft alcyonarian corals constituting 21% of all biotic and abiotic substrates.

Inconsistency in data recording by different monitors in different monitoring period continuous to be the same as previous as a result of new participants collecting data is another as there is no designation of who is to be responsible for substrate which can ascertain standardization of data acquisition during each monitoring period.

4.2. Reef Fish

4.2.1. Distributions herbivore, carnivore and Humphead Maori Wrasse.

Mean abundance for reef fishes inside and outside no-take continue to be very low. Average recorded in this monitoring was as low as 15 herbivore fishes/500m^2 for all 6 monitoring stations. There was a 60% decline in average population for herbivore fishes in this monitoring compared to that recorded in July, 2012. Thus, in July the average record for herbivore fishes was 40.7 herbivore/500m^2 while only 15.16 herbivore/500m^2 was recorded in this October monitoring period. Population for reef carnivore fishes continue to decrease in this monitoring period when we look at the results collected in the April and July monitoring periods. Data for IUCN/aesthetic species also showed a similar trend with decreasing effect from April through to October.

Proper explanations for such a declining average cannot be made at this stage as it is too early to make any conclusions on the findings of a short monitoring program. It will only be wise to say that fishes are highly mobile and can move within and between reefs therefore, they shall never be found at one place only during different monitoring period. Food supply within a reef could be another factor determining species aggregation to feed. Thus, feeding also occurs at different times of the day for different fishes and our monitoring times are not standard to regularly monitor fish populations at any specified time. The fluctuation in population numbers cannot be an attribute of overfishing over a very short time however, if the population continues to be recording as such for a long time then we can assume that fishing for herbivore and carnivore fishes have taken place for some time, affecting different fish groups (cohorts) that could result in low abundance of different fish sizes.

4.3. Sea Cucumber

As described in section 3.3.1, there was not a single sighting and/or record for any sea cucumber species inside any of the 12 monitoring stations. Although there were some sightings on the reefs outside no-take, those cannot be recorded.

4.4. Clam Shell

Population of giant clam observed in this survey showed very little very little variation and appeared to be the same those documented in previous monitoring. Observer error or data collecting error continued to be another common source. Misidentification between maxima clam (TM) and scaly clam (TS) continued to be a worry for inaccurate data collection.

4.5. Other invertebrates *(Lobster, trochus, crown-of-thorn starfish)*

The table below summarizes all averages for lobster, trochus and crown-of-thorn starfish that were recorded in the last 3 monitoring period (April, July and October 2012).

Sites inside no-take

Marine Invertebrates	April 2012	July 2012	October 2012
Lobster	0	0	0.16
Trochus	0.5	0	0
Starfish	0	0.33	6
Crown-of-thorn starfish	0	0	1.83

Sites outside no-take

Marine Invertebrates	April 2012	July 2012	October 2012
Lobster	0.17	0.17	0.16
Trochus	0.33	0	2.5
Starfish	0	0	0.66
Crown-of-thorn starfish	0	0	0

Lobster

Data from the 3 monitoring programs for no-take clearly show very low presence of lobster for many reefs inside no-take. It is highly likely that in any monitoring transacts one or two individuals can be found. The data presented in the table must not mislead you to believe that there was no lobster around the island. There are lobster species observed on many reefs inside no-take however, specific to each monitoring transacts there may be one, two or no individual species recorded. There appeared to be one or two individual species within the monitoring transacts for all 6 sites outside no-take.

Trochus

The average abundance of trochus shells inside no-take and outside no-take shows that there are few trochus shells found on reef outside no-take. The values displaying mean abundance can be considered too low as a result of their sparse distribution and abundance on many reefs both inside and outside no-take.

Crown-of-thorn (CoT) starfish.

Records for crown-of-thorn starfish have been low over the last 7 months. Maintaining of low population is good for healthy coral reef ecosystem as crown of thorn outbreak have always can cause death to corals.

5. CONCLUSION

There is not much distinction or stand out feature of this monitoring compared to the last two monitoring programs. The weather condition was fine and much better than the conditions faced by local monitors in April and July where there was strong winds, swells and cold water condition that affected many of the monitors who took part that time.

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