



CORAL TRIANGLE INITIATIVE

ON CORAL REEFS, FISHERIES AND FOOD SECURITY



NUAKATA COMMUNITY BASED RESOURCE MONITORING PROGRAM SURVEY REPORT #: 8

MONITORING PERIOD: OCTOBER 2012



June 2013

This publication was prepared for Papua New Guinea's National Coordinating Committee and the Nuakata Island Community Marine Managed Area with funding from the United States Agency for International Development's Coral Triangle Support Partnership (CTSP).



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Nuakata Community Based Resource Monitoring Program Survey Report #: 8 Monitoring Period: October 2012

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USAID PROJECT NUMBER: GCP LWA Award # LAG-A-00-99-00048-00

CITATION: Isaac, S., and N. Wangunu. *Nuakata Community Based Resource Monitoring Program, Survey Report #: 8, Monitoring Period: October 2012*. Honolulu, HI: The USAID Coral Triangle Support Partnership, 2012. Print.

PRINTED IN: Honolulu, Hawaii, USA, June 2013

This is a publication of the Coral Triangle Initiative on Corals, Fisheries and Food Security (CTI-CFF). Funding for the preparation of this document was provided by the USAID-funded Coral Triangle Support Partnership (CTSP). CTSP is a consortium led by the World Wildlife Fund, The Nature Conservancy, and Conservation International with funding support from the United States Agency for International Development's Regional Asia Program.

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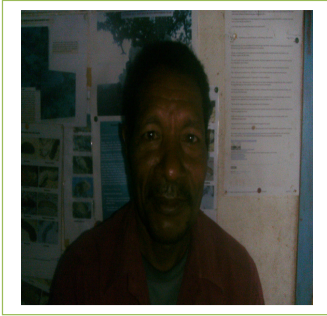
**NUAKATA COMMUNITY BASED RESOURCE MONITORING
PROGRAM**

**SURVEY REPORT #: 8
MONITORING PERIOD: October 2012**



MONITORING REPORT WRITTEN BY
Simeon Isaac
(Nuakata CMMA Data Specialist)

CHAIRMANS WELCOME



**NUAKATA CMMA CHAIRMAN
MR. ANANIA MESIGAI**

Dear Readers and the people of Nuakata Island. I firstly welcome you all to this 8th edition of Nuakata Island community managed marine area resource monitoring report. This report is no different to other 7 monitoring reports which many of you must have read. For those who are new to this, let me highlight to you how this reports are written and how the results have been gathered and who does the actual work of conducting monitoring and collecting field data which is later translated into a report like this.

1. Monitoring of resources are done in 8 reef areas that are inside our no-take areas (or managed reef areas). There are permanent monitoring transects placed in each of the 8 identified reef areas inside no-take and 8 reef areas outside the no-take zones. The purpose of having this monitoring is to see the status of our resources whether they are declining or they are recovering.
2. Monitoring is conducted on a voluntary basis by youths as well as members of our community managed marine area (CMMA) management committees. During field monitoring, raw information or data is gathered for target indicator species that we have chosen.
3. Once the data is collected, our locally trained data officer then takes this data to Alotau upon request from Conservation International to do simple analysis and to produce a report like this you are now reading.
4. The purpose for such monitoring report is to inform our community about the changes that are taking place within our reef areas. Thus, whether fish and sea cucumber population is recovering or is not. By doing this kind of monitoring over a long period of time can only give us good information on how we the people of Nuakata manage our resources.

I also would like to emphasize that this program does not belong to Conservation International. This program is ours and the we can only be grateful to having an organization like Conservation International to provide the logistics and funds for such to be executed.

I would urge you all to come and join us in this initiative we are taking as we see that the long term benefits of what we do now will benefit our community as a whole. Let me also say that this program is not limited to the committees and the youths only but is a whole community initiative as a step toward saving and managing what we have today for our long term good as well as for our children and theirs to enjoy and appreciate that we have done something during our time to ensure they do not miss out on what we are enjoying today.

Before I leave I would like to take this opportunity to sincerely thank all the participants who have been involved in this 8th monitoring and commend you all for a job well done. I also would like to thank Conservation International for its continue funding and support of this initiative.

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

This report marks the completion of 8th monitoring program for the people of Nuakata CMMA. The results gathered from this monitoring have been analyzed and presented in section 3 of this report. All monitoring methods have been done in a similar way as those done previously, and the presentation of monitoring results is also done in a similar way so that readers can follow through the report and understand what is happening. As mentioned earlier, population trend for each species is not done in this report but, will be done in the coming December monitoring report.

2. METHODS

2.1. Field Data Collection

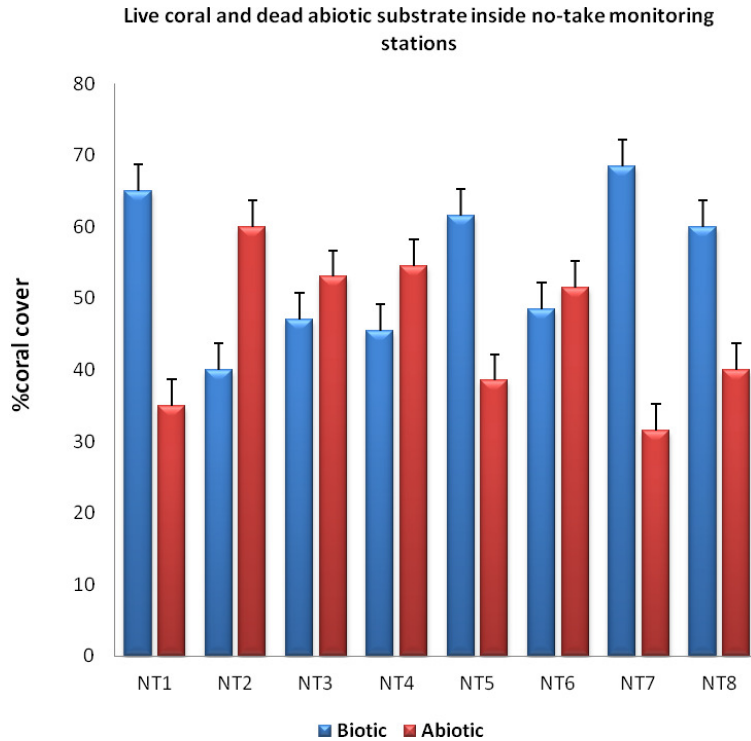
Monitoring methods used was the same as those used previously. Logistics such as boats were hired locally on a dry weight hire whereby fuel was supplied by Conservation International.

2.2. Data analysis

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

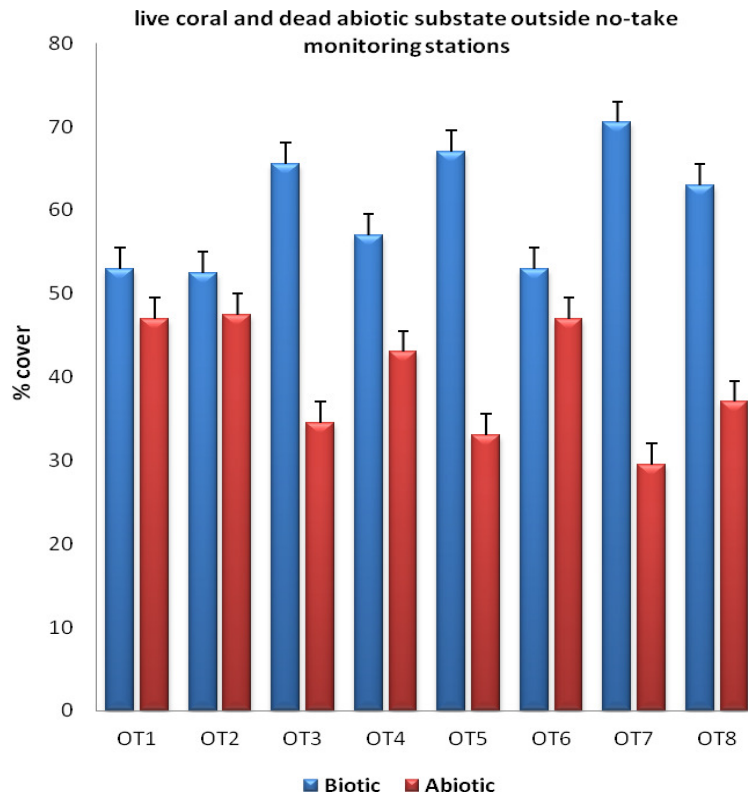
3. RESULTS

3.1.1 Benthic substrate for reefs inside no-take



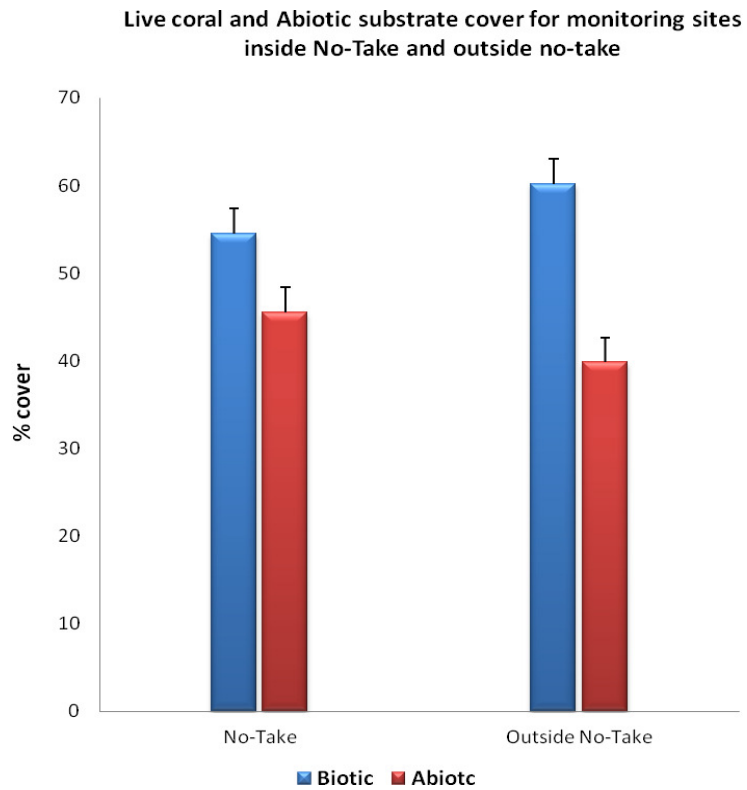
The benthic substrates for 8 monitoring stations outside no-take showed an average of 54.5% live coral cover. This high average for 8 monitoring stations were attributes of NT.7 (68.5%); NT.1 (65%); NT.5 (61.5%) and NT.8 (60%). Similar to other monitoring results, NT.7 comprised 29.5% submassive corals (SMC) while NT.1 recorded 16.5% SMC and 12.5% branched corals (BC); NT.5 recording 19.5% of table corals (TC) and NT.8 recorded 15% (BC) and 11.5% (SMC). All other monitoring stations including NT.6, NT.3 and NT.4 all recorded 48.5% live corals respectively. The monitoring station that recorded the least live coral cover was NT. 2 with (40%).

3.1.2. Benthic substrates for reefs outside no-take areas



Results from this monitoring clearly showed a high live coral cover for all 8 monitoring stations outside no-take. On average, reefs found outside no-take had around 60.2% live coral cover and 29.8% dead, abiotic substrate. Individual site record showed very high live coral cover at OT.7 (70.5%); OT.5 (67%); OT.3 (65.5%) and OT.8 (63%). All other monitoring stations had coral cover between 57%-52.5%. At OT.7, the 70% comprised 14.5% of BC and at OT.5 67% majority of coral morphologies were SMC (24.5%) and OT. 3 (65.5%). The most featured coral type was BC (17.5%) and SMC (16%).

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

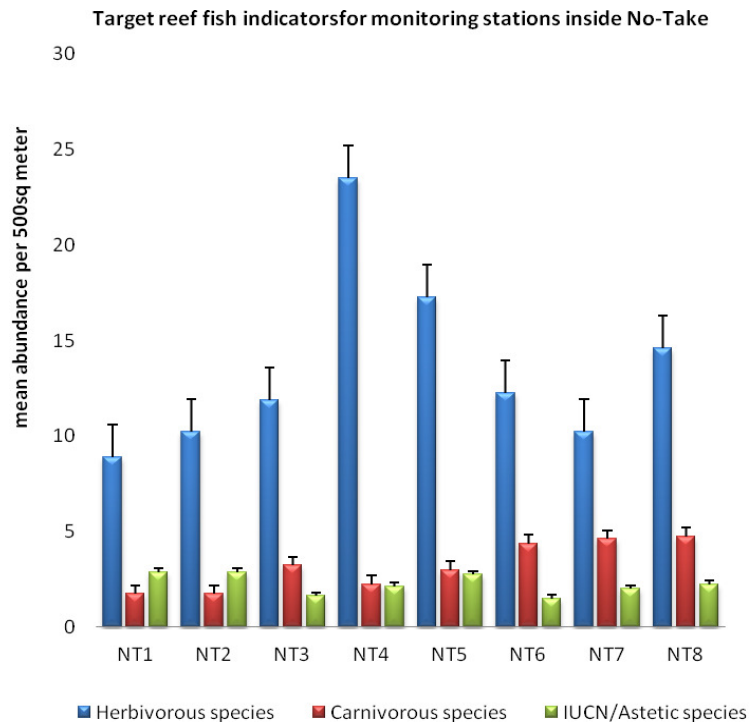


It was evident that there was a slight increase in the percentage cover for both 8 monitoring stations inside and outside no-take. On average, no-take monitoring areas recorded 54.5% live coral cover and sampling stations outside no-take recorded 60.2% live coral cover.



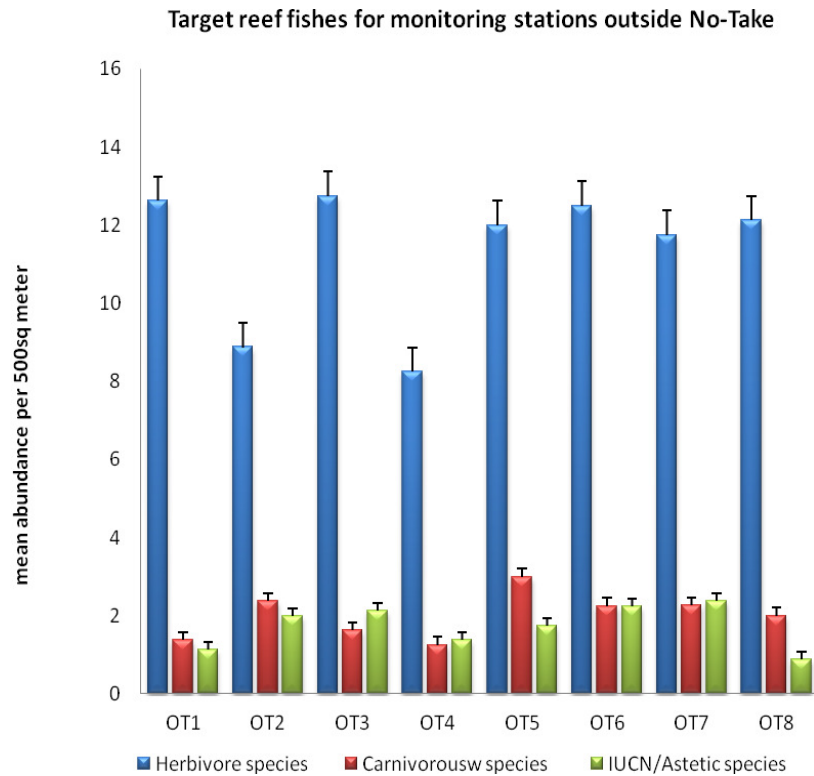
3.2 REEF FISH INDICATORS INSIDE & OUTSIDE NO-TAKE AREAS

3.2.1. Target Reef Fish indicators inside no-take



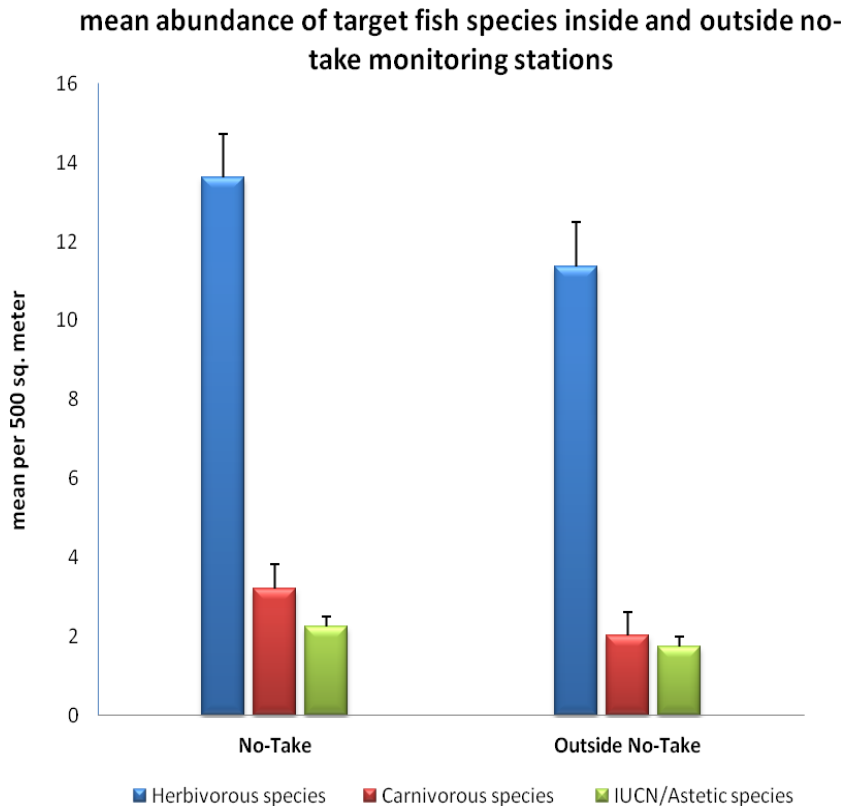
The overall average for all 8 sites was 13.6 herbivore/500m² study area. Monitoring stations with high averages include NT.4 (23.5 herbivore/500m²); NT.5 (17.3 herbivore/500m²); NT.8 (14.6 herbivore/500m²) and NT.6 recording 12.3 herbivore/500m². All other sites had lower than 12 herbivore/500m². The results for carnivore fishes continued to be low with an average of 3.2 carnivore/500m² in all 8 monitoring stations. Thus, results for IUCN/aesthetic fishes also continued to be low, with a low mean abundance of 2.3 carnivore fishes/500m².

3.2.2 Target reef fish monitoring indicators outside no-take



Very similar to the results for sites inside no-take, the average for herbivore fishes outside no-take for all 8 monitoring stations was 11.4 herbivore/500m². 4 sites out of the 8 monitoring stations had averages over 12.0 herbivore/500m². As shown in the above graph, OT.4 recorded the least/lowest population numbers with an average of 8.8 herbivore/500m². Averages for carnivore fishes continued to be low with average of 8.8 herbivore/500m². Average for carnivore fishes continued to be low with an average record of 2.01 carnivore/500m². Results for IUCN/aesthetic species also showed low mean population counts for all sites outside no-take.

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

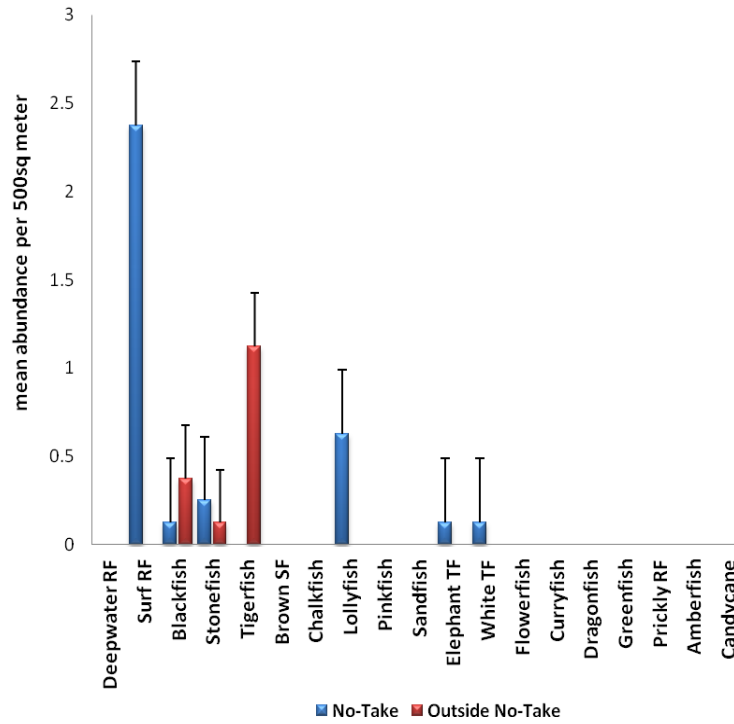


Population of herbivore fishes continued to be dominant over other target monitoring groups. Thus, averages for herbivore fishes inside no-take was 13.6 herbivore/500m² while that recorded for sites outside no-take was 11.4 herbivore/500m². Although there was not much difference between the two records. Averages for carnivore fishes inside no-take and outside no-take were very similar. Sites inside no-take recorded an average of 3.22 carnivore/500m² while sites outside no-take recorded an average of 2.02 carnivore/500m². Results for IUCN/aesthetic species has a very similar but a slightly low averages for both no-take and outside no-take. Thus, the no-take areas recorded 2.25 species/500m² while the outside no-take stations recorded an average of 1.73 species/500m².

3.3 MARINE INVERTEBRATE

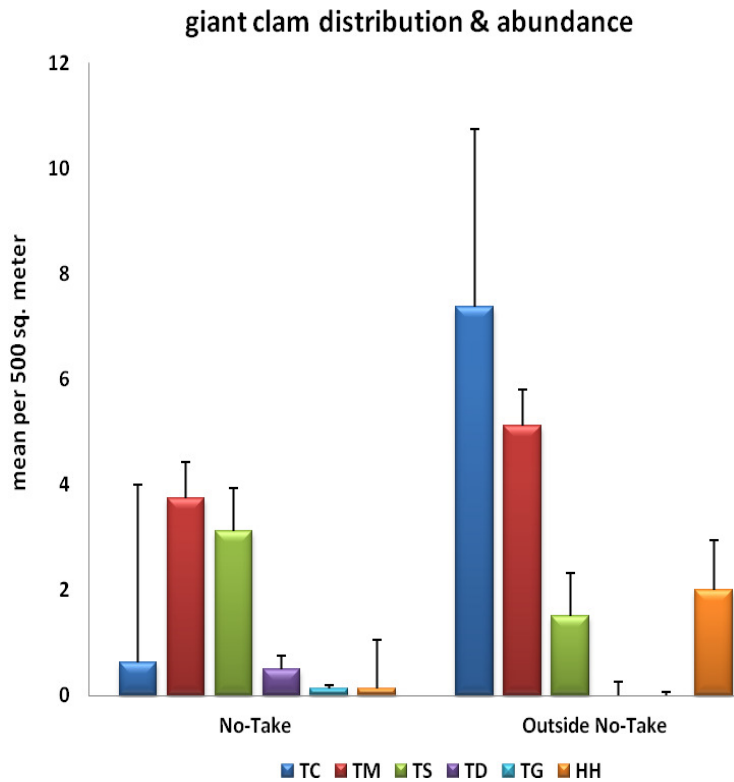
3.3.1. Sea cucumber

average sea cucumber species within NT and OT monitoring stations



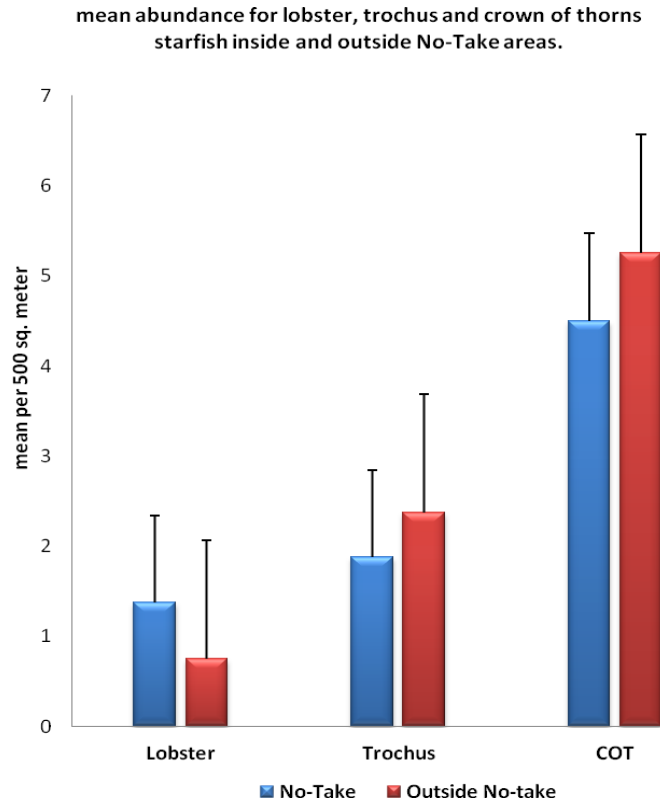
The sea cucumber species that showed high average was Surf Redfish with an average of 2.34 individuals/500m². The second species with next highest average was lollyfish with an average of 0.63 individual/500m² for all monitoring stations inside no-take areas. A few counts of stonefish were also recorded in a few sites, giving an average of 0.25 individual/500m². Other sea cucumber species also found in the no-take areas were Elephant trunkfish and White teatfish, both having an average of 0.13 individuals/500m². Sites outside no-take displayed a high abundance of Tigerfish with an average of 1.13 individual/500m² while blackfish recorded an average count of 0.38 individual/500m² and stonefish recording an average of 0.13 individuals/500m².

3.3.2. Giant Clam



Maxima clam (TM) showed a high average of 3.75 sp/500m² inside no-take and 5.13 sp/500m² outside no-take areas. Boring clam or TC recorded its highest average at the sites outside no-take, with an average of 7.38TC/500m². Other clam species like the southern giant clam was also recorded inside no-take and has an average abundance of 3.13 sp/500m². The bear paw clam or Hippopus hippopus clam also recorded good averages for the sites outside no-take than at the sites inside no-take.

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



This monitoring showed a high average record for crown-of-thorn starfish for both no-take and sites outside no-take. The average record per 500m² for sites inside no-take was 4.5 CoT/500m² while monitoring stations outside no-take recorded an average of 5.25 CoT/500m². This averages are higher than those recorded in the July monitoring. Data for trochus revealed an average of 1.38 lobster/500m² inside no-take and 0.75lobster/500m² outside no-take areas. Averages for trochus in all monitoring stations clearly showed an average of 1.88 trochus/500m² inside no-take and 2.38 trochus/500m² outside no-take monitoring stations.

4. DISCUSSION

4.1. Benthic substrate

The results for live coral cover recorded in this monitoring period showed a large contrast to that displayed in July. Hence, a lot more monitoring stations recorded high coral cover. Some areas that recorded high coral cover percentage in the last monitoring showed medium to average coverage while others that recorded low percentage showed high cover in this monitoring period. There are a number of reasons why there was fluctuations in the amount of coral cover and some of these reasons are provided below.

- All 8 monitoring stations were sampled in this period where as in July, only 6 out of 8 stations were surveyed.
- Placement of transect in every survey have never been exact to the previous survey therefore a difference of +/-10% in coral cover is expected to cater for this. If the differences are below or over the 10% mark than other explanations can be made to allow for this.
- Inconsistency in data recording and handling could also be another attribute that could have contributed to the differences and fluctuations we observe.

In this monitoring our data showed that reefs having high coral cover were; Panamoimoi SE or SE of Grace Island (NT. 7); Hibwa (NT. 1) and the northeastern end of Panamoimoi Island (NT. 8) and Gallows NE (NT.5). From these monitoring stations it should also be noted that there has been relocation of transects from their initial sites to new locations within that reef. Relocation of site NT. 8 was due to the shallowness of the monitoring transect that during low tide it was hard for monitors to conduct their survey. For that reasons the monitoring transect was relocated to a deeper area where on the same side of the island. Site NT. 5 (Gallows) was another site which previous monitoring transect could not be located therefore, a new transect was placed within the vicinity of the same reef. It was good to see an average live coral cover of over 50% for the no-take monitoring areas as it may reflect what other reefs are like in terms of their percentage cover.

Sites outside the no-take monitoring stations also recorded a lot more live coral cover in this monitoring period compared to the last monitoring periods. As mentioned in the paragraph above, there has also been some relocation of monitoring transects done as well. Site OT. 1 (Sioyoaoyoa) has been relocated to **Bolime** while site OT. 6 (Boirama) has also been relocated to **Gadoa Mwalaina**. These two changes were made as a result of local dispute by those who do not support this resource management initiative taken by the people of Nuakata and Conservation International.

A further analysis of monitoring sites inside and outside no-take indicate that the corals with morphologies or structures like branches, table or plate corals and digitate were more abundant on many reefs located outside no-take while corals with appearances like brain, boulder, sub-massive and massive structures tend to be distributed on reefs inside no-take areas. An explanation for these can include the locations of where these reefs are located. Many fringing and patch reefs are located on sheltered areas where impacts of waves and currents are minimal which allows such growths as those described for many sites outside no-take. Thus, no-take areas are located on isolated, barrier reefs which often circum to waves, surges and currents therefore have these boulder and massive structures. The

purpose for having such structures is to withstand these harsh conditions. The outside no-take reefs also have distributions of branching, table and plate corals but are found on the inner reef flat areas or at the deeper end of the reefs. The key reason for this kind of distribution lies with the corals' ability to resist the any harsh conditions. Thus, building up resilience through its morphological structures is another key attribute to such displays on many reefs that we see.

4.2. Reef Fish

4.2.1. Distributions herbivore, carnivore and Humphead Maori Wrasse.

Population of herbivore fishes determined in this monitoring period was a little higher than that recorded in the July monitoring period. Thus, this monitoring period had an average abundance of 13.6 herbivore/500m² while the average seen in July was 6.42 herbivore/500m². These has been an increase of 52.8% over the 4 months period between the two monitoring program. This increase is nothing significant but is part of the population fluctuation that occurs between each monitoring programs.

Mean abundance for carnivore fishes for sites inside no-take in this monitoring period was 3.12 carnivore/500m² while monitoring stations outside no-take recorded an average of 2.02 carnivore/500m². These averages are higher than what has been recorded in July, 2012. There was an increase of 88% for sites inside no-take and 46% for sites outside no-take. These fluctuations cannot be determined by this level of monitoring but will require a more rigorous study.

The population of IUCN/aesthetic fishes like the Maori wrasse and Moray eel also showed low abundance in both the no-take stations and outside no-take. Respective averages for this monitoring was 1.73 species/500m² for reefs inside no-take and 2.25 species/500m² for the stations outside of no-take. The averages in this monitoring period are a little higher than those recorded in July. At this point in time we can only speculate that timing by with the monitoring was conducted could have coincided well with their active feeding times on the reefs or that the monitoring was conducted at their active times on respective reefs.

Other possible explanations to the fluctuations in each monitoring programs could be attributed to the following factors;

- Error in data recording, handling and processing
- Inconsistency in monitoring timing
- New inexperience local data monitors
- Hindrance from weather patterns driving waves and cold that affect local monitors

4.3. Sea Cucumber

Data from this monitoring showed low species presence as well as low abundance for those species that were recorded inside each monitoring transects. Hence, not all monitoring transects had sea cucumber presence nor were there any good abundance record as well. The previous monitoring (July 2012) showed high species aggregation inside many monitoring stations however; this monitoring only recorded 6 species inside no-take and 3 outside no-take. Species that were recorded inside no-take include Surf redfish with average of 2.34 individuals/500m²; Lollyfish having an average of 0.63 individuals/500m²; blackfish with an average of 0.125 individuals/500m²; stonefish with an average of 0.25 individuals/500m²; Elephant trunkfish with an average of 0.13 individual/500m² and White teatfish with an average of 0.13 individual/500m². For the sites outside no-take, the following were recorded. Blackfish with average of 0.38 individual/500m²; Stonefish with its average of 0.13 individual/500m² and Tigerfish having the highest average abundance of 1.13 individuals/500m².

having described all that has been seen and recorded inside and outside no-take monitoring stations, one must not think that those were the only sea cucumber found because there were other species such as Amberfish; Prickly redfish, Greenfish and Curryfish that were also observed on many reefs but since they were not found inside the 500 meter transect area or study area, they were not recorded and described. Another key feature observed on many reefs was the presence of smaller sized sea cucumber which indicate that recruitment is taking place on many reef areas.



4.4. Clam Shell

There were some differences in the distribution and abundance of sea cucumber in this monitoring and in the July's monitoring. Firstly there was a slight increase in the averages of sea cucumber numbers and secondly, there was a lot of new records for bear paw clam (HH) in many areas outside no-take areas. The average record for HH in this monitoring period was 2.0 individuals/500m² compared to a zero record in the July monitoring program. Simple error by individuals like misidentification between TS and TM continue to be part of the program which, will require considerable amount of time to get local participants fully understand the key differences among all sea cucumber species.

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

Lobster

There was a slight increase in the number of rock lobster recorded in this monitoring program. Hence, the average recorded for sites inside no-take was 1.38 lobster/500m² while sites outside no-take had an average record of 0.75 lobster/500m². Records from the July monitoring showed an average of 0.75 lobster for no-take and 2.0 lobster/500m² for the monitoring stations outside no-take.

Trochus

The average recorded in this monitoring period was 1.88 trochus/500m² for no-take areas and 2.38 trochus/500m² for sites outside no-take. This data when compared with the previous monitoring report clearly showed that there were more trochus shells in the areas outside no-take.

Crown-of-thorn (CoT) starfish.

This monitoring period had a high abundance of crown-of-thorn starfish recorded from sites outside no-take areas. An average of 5.25 CoT/500m² was recorded for the 8 stations outside no-take while the no-take areas recorded an average of 4.5 CoT/500m². This record is higher than the averages recorded for the July monitoring. Thus, there was an increase of 76% to what was recorded for monitoring stations outside no-take in July. Data for no-take showed a 100% rise in from a zero record in July. A probable explanation for this would be that most of these CoT were within the reef vicinity in July but were not present in the transect area. Thus, during this monitoring period they could have moved within the reef system that they are found in the monitoring areas. Other external factors such as those that give rise to their population cannot be accounted for at this time as the environment was not conducive for any population rise.

5. CONCLUSION

Monitoring results for October was a little better in comparison to the results gathered in the July monitoring period. There was a lot more live coral cover recorded to many of the monitoring stations both inside and outside no-take, and the average for target monitoring fish species, sea cucumber and other invertebrates continued to show increased averages. Some target monitoring species cannot had low population counts than those identified in the previous monitoring period while others have had a continuous fluctuation in over the last 3 monitoring period. Possible explanations for such have been discussed however; more rigorous study needs to be done in the future to fully determine these shift populations as shown as fluctuations over different monitoring periods.

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