Report on the Search for *Trochus niloticus* in the Samusu and Amaile reefs

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1. INTRODUCTION

In Samoa the *Tectus pyramis* and the *Turbo chrysostomus* are generally spread through out the reefs within suitable habitats. These habitats are mainly of shallow sunlit waters within the lagoon and reefs. The juvenile species are mainly found in lesser rough waters while adult species are known to thrive on reef flats towards the reef slopes. They are herbivorous and mainly feed on algae (turf algae), diatoms and foramaniferas on dead corals and rock surfaces. (Bell & Mulipola,) 1995

The trochus *Trochus niloticus* in not naturally found in Samoa. It was first introduced to Samoa in 1990 from Fiji in two separate shipments in August and October consisting of 50 and 78 shells respectively (Bell, 2001). Eighty shells were released at both Namu'a and Nuutele Islands at Aleipata and no known follow up assessment was carried out by the Fisheries Division for these introductions

In 2003, the ACIAR with the Fisheries Division developed another trochus project as part of a regional trochus project by the Australian Centre International Agriculture Research (ACIAR). The project was mainly to take advantage of the existing 'Community-base Fisheries Management Program', in which communities with suitable reef habitats for trochus were used as seeding sites for the restocking of *T. niloticus* brood stock with the long term objectives of a successful establishment, reproduce and enhance the trochus population within these reefs. As a result the communities are well aware on the importance of proper management of these brood stocks and to disperse these new species to other suitable reefs for expanding establishment within Samoa. There were four reefs in which the project started of with namely Saleapaga and Safa'ato'a in Upolu and Papa i Puleia and Foailalo in Savaii. In 2007 a new site Savaia was stocked with the juveniles produced from the Fisheries hatchery back in 2005. The *T. niloticus* were brought in from 3 different shipments with first from Vanuatu in 2003 with 900 species the second shipment was in 2004 from Fiji with 356 species and the last shipment in 2006 with 900 species from Vanuatu via Fiji. (Lee & Samuelu, 2007)

Since the completion of the project in 2007, the Fisheries Division has sustained this initiative through periodic monitoring for these species by its Inshore Fisheries Section. The periodic monitoring was on a quarterly basis (3 months) and is now on a bi-annual basis. The monitoring mainly involves identifying the trochus shells and taking measurements to determine its growth rate.

However, in the beginning of 2009 there was citing of the *Trochus niloticus* species being sold at the fish market in Apia by the local fishermen from the Aleipata district. These fishermen claim that these species are abundant at their reefs in Samusu and Tiavea. These villages are a mile or so to the west of the Namu'a island.

Therefore the Fisheries Division organised a search at these suspected reefs at Samusu and Amaile, to confirm whether this claim was true or not.

On the 12th Feb 2009, staff from the inshore section and Aquaculture section set out to Samusu to search for confirmation of presence for these shells. This search was in collaboration with the staff of the Division of Environment and Conservation (DEC) as these villages (Samusu and Amaile) are both with marine protected areas (MPA) under the management of the DEC.

This report discusses the findings from this search and recommendations on further actions needed are also presented.

2. METHOD

The team was divided into two groups and were dispersed to cover the Samusu reef approaching from both ends. One team were to work from east to west while the other team searched from from the opposing direction and have a meeting point within the middle of the Amaile reef.

The estimated area of coverage was 50m in width and 200m in length which is 10,000m^2 in area. The search began at the lagoon area close to the reef flat and where the rubbles and rough areas were abundant.

Snorkelling gears were used and the search was carried out at 11am as the tide was going out (LTT-1347).

There were eleven staff from the Fisheries Division and two staff from the Division of Conservation and Envrionment that carried out the assessment. (Sapeti Tiitii Joyce S Ah Leong, Faafouina Sua, Tauvae Sua, Misipele Afamasaga, Isaia Matau, Ferila Samuelu, Faamanatuga Itagia, Tevita Apulu, Iona Sagapolutele Enoka Tavita and Pulea and Ioelu from the DEC.

3. RESULTS & DISCUSSIONS

- Trochus (*Trochus niloticus*)

Table 1 shows the different class size of the *T.niloticus* found from the search. The class size 30-40mm and 41-50mm both shows dominance of the total shell found. This gives an indication on the maturity of species in the reef flat which are mainly of juvenile species. The class 100-120 were adult live trochus found at the mouth of the reef channel.

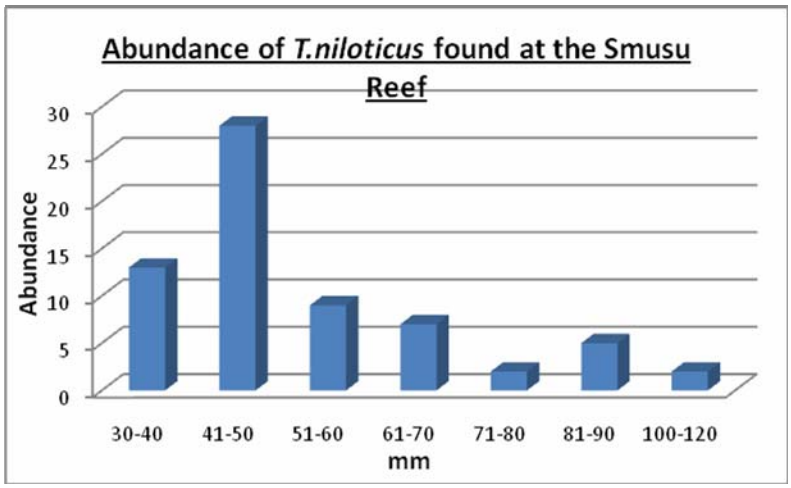
There were 66 live shells found within an estimated area of 150m x 50m (7500m^2). This means that there is one species in every 114m^2 or 35 species/acre or 86 species/ hectare.

The widespread of the trochus species in the area were random. This was a very good sign as it is an indication that the whole lagoon area is suitable for the establishment of the trochus. They were mostly attached to the rubbles and corals and were found individually and not in cluster or groups.

This is a good coverage and none of the stocked reefs from the project was ever recorded with this abundance of trochus.

Towards the end of the search, two staff searched at the mouth of the reef channel and found two large trochus (120mm) along the channel walls. This indicates that there is a possibility of more of these sizes along the reef channel and possibly the reef slope. The reef slopes are areas to be known to host adult species.

Table 1: The abudance of the species T.niloticus in each size classes of 10mm found at the Samusu reef



- Live corals

The other substrate group that were very noticeable during the search was the coral coverage within the lagoon and reef areas. At the inner lagoon, there was an abundance of the coral massive (*Porites sp*) with an estimated 70%, there were also *Acropora* branching (10%) and *non-Acropora* branching corals (5%). The rest were of small patches of sea grass (*Halophila ovalis* – 5%) and sand (10%).

On the reef flat, there was quite an abundance of rubbles (50%) as a result of strong waves and rough conditions, however there was also a pre-dominant of coral species as a sign of recovery from these rough conditions. The live corals were mostly of the more resistant types such as the *Acropora* tabulate (15%) and *Acropora* digitate (15%) and patches of *Halimeda* species (20%) compacting and enhancing reef formulation.

- Fish and Invertebrates

There was an abundance of reef fish and invertebrates within the lagoon and the reef. The lagoon were mainly of small reef fishes such as the butterfly group and the damsels species treating coral patches as their territories, the bigger groupers, wrasses, parrotfish and surgeons were more common at the mid lagoon and around the reef channel mouth.

The sea urchins were just seen through out the lagoon and the reef area, the long spine sea urchin were more common on the reef flat as a sign of frequent disturbance at the area which can be rough wave actions and gleaning from local fishermen/women. The green fish and the lolly fish were the more common of the sea cucumber groups while very few brown sandfish and black teatfish were also observed.

There were also a number of local trochus species Tectus viridis, however most were of juvenile species. There were quite a number of silver mouth turbans and few conch were also identified.

The area provides suitable habitats for both sea cucumbers and urchins, however it was told that this area is targeted by the local fishermen and most of these fishermen fished and sell their catches daily in both Samusu and Amaile

4. RECOMMENDATIONS

The assessment was successful given that the main purpose was to confirm whether the claims by the local fishermen who fished and found trochus in the area were true. Therefore it is fair to say that the species *Trochus niloticus* are present within the Samusu and Amaile reefs.

The assessment also provides an insight of what the next steps are to protect these species from over harvesting. Therefore the team recommend the following actions:

- To carry out another collaborative search at other reefs in Saleaumua towards Satitoa to assess the expansion of this establishment. It is believed that these populations are the results of the stocking in the early 1990. Therefore a more thorough search is needed at these reefs using both snorkelling and SCUBA gears for deeper areas.

- Since these villages are already in collaboration with the DEC, it is recommended that urgent awareness programs are needed in these villages to elaborate on the findings of the search and also look into ways to prevent the over harvesting of these species. The Village Advisory section from the Fisheries Division can assist in the management plans formulation or review of the existing management plans and village by-laws to clearly safe guard these species.

- The FD with the DEC to establish a monitoring program to evaluate the status of these stocks and then look into ways to sustain this initiative like training the communities members to carry out basic monitoring in particular the fishermen who are out fishing these species.

- To review current regulations from both the FD and the DEC to include a provision to ban the harvesting of these species or ban the selling of juvenile species.

5. CONCLUSION

Overall the search was successful in terms of confirming the presence of the *T.niloticus* at Samusu and Amaile reefs. The conditions of the reefs also very much favour the growth of this species. The recommendations presented reflect the urgency for both the government bodies the DEC and the FD to take immediate actions in making sure that these stocks are not over harvested. Also the importance of having the communities understand on how long it took for these species to established since introduction in the early 90's and should appreciate the abundance for their daily use and to make sure they are sustain for future generations.

6. APPENDIX

Appendix 1: Raw data on sizes of Trochus niloticus found at the Samusu Reef.

Trochus niloticus sizes in mm	Numbers
30	1
34	1
35	2
39	1
40	8
41	1
42	2
43	1
45	15
46	2
49	3
50	4
52	1
55	3
58	1
60	4
62	2
64	1
65	2
70	2
80	2
85	2
120	2
TOTAL	66

7. REFERENCE

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