

**Summary Report on Current Status of Coral Reefs in  
Samoa after Cyclone Heta**

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**by**

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## 1. INTRODUCTION

Coral reef monitoring has been an on-going activity in Samoa since 1997. In 1998, a pilot Village Level Coral Reef Monitoring Project (VLCRMP) was initiated in collaboration between the Fisheries Division, the Division of Environment & Conservation and the International Ocean Institute – Pacific Islands. The pilot project provided monitoring equipment and assisted in training the trainers that, in turns trained 46 villagers from six villages selected from around the country ( Mulipola 2001 ). As a result of the project, several communities have members that are now equipped with the monitoring techniques and they are collaborate with staff of the FD implementing the monitoring of coral reefs in the established community-owned fish reserves.

Given the large number of small community-based MPAs, only 10 sites have been identified for long-term monitoring. These are Saleapaga, Palolo Deep, Samatau, Safaato'a and Tafitoala on Upolu; Vaisala, Fagamalo, Papa-I-Palauli and Siufaga on Savaii; and Lepuai on Manono. There are more than 50 inner lagoon fish reserves on three islands Manono, Upolu and Savaii. The reserves were established since 1997 and continue to do so under the Fisheries Community-based Management Programme supervised by the Fisheries Extension and Training Programme. Reserves vary in size from 15,000m<sup>2</sup> to 150,000m<sup>2</sup> where some start from the shoreline out to or before the reef crest (Mulipola *et al.* 2001).

On the 14<sup>th</sup>-16<sup>th</sup> January 2004, the Fisheries Inshore Section staff headed out for a quick resurvey around Upolu and Savaii during 18<sup>th</sup>-22<sup>nd</sup> January 2004. The main purpose of the assessment was to collect data regarding coral coverage. This will enable us to observe and define any major changes for marine and coral species present in the reserves whether they were affected and how severe was the damage. Importantly, the results will also enable the Inshore Fisheries to determine a good estimate on the damage and the current status of Samoa's Coral reefs after devastated Cyclone Heta hit the country on 3<sup>rd</sup>-4<sup>th</sup> January 2004.

There were only ten selected Marine Protected Areas including six sites under Global Coral Reef Monitoring Network (GCRMN) Programme and four under Fisheries Division to represent all coral reefs of Samoa. The GCRMN sites includes Palolo Deep, Samatau and Safaato'a on Upolu; and Papa-Puleia, Fagamalo and Vaisala on Savaii. The Fisheries Division MPAs includes Vaovai and Saoluafata on Upolu; and Fagasa and Luua-Faga on Savaii. The monitoring team consisted of Nofoaiga Tausa, Joyce Samuelu, Anama Solofa, Clifton Fepuleai, Misipele Afamasaga, Tevita Apulu, Isaia Tiitii and Mikaele Fa'ama'i.

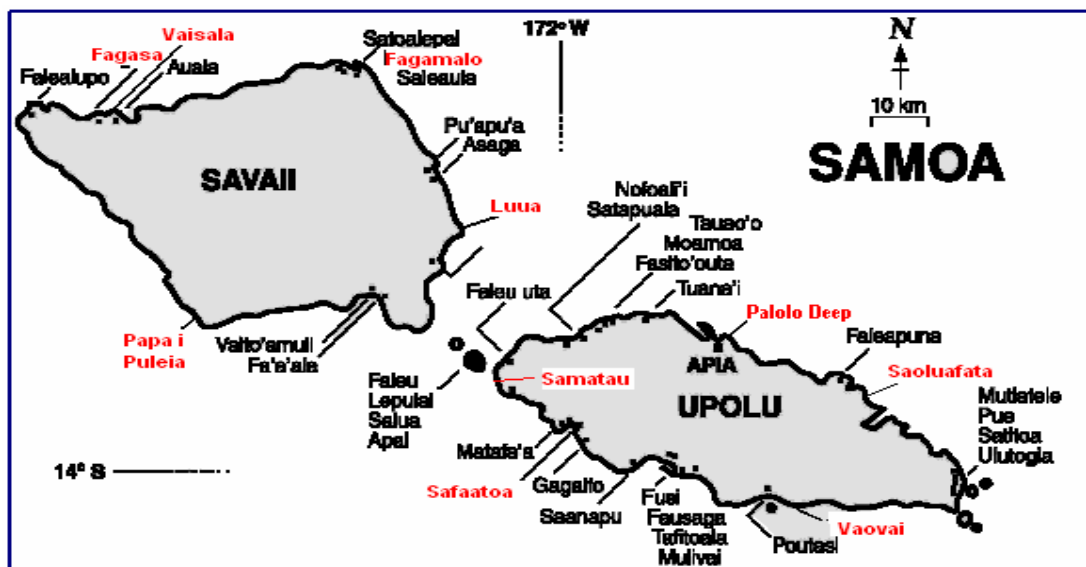


Figure 1: Map of Samoa indicating the locations of community-owned Fish Reserves being surveyed.

## 2. METHODOLOGY

The methods used were basically underwater visual census with 3PIT as the standard monitoring methods used. In surveying coral coverage, the Three Point Intercept Transect (3PIT) was utilized in observing and counting coral cover and other substrates. This method involves three people swimming parallel to the tape, one in the middle, left and one on the right. The two people on both sides (left and right) are separated from the middle person by two meters (1 m from the middle). As they swim along, they make stops at every two meters and record substrates by using codes starting from 0-50 meter.

## 3. RESULTS

The data collected over the 14<sup>th</sup> – 22<sup>nd</sup> January 2004 were analysed and summarised based on the proportion of coral coverage by islands, villages and by coral substrate types. There were 10 sites surveyed and 5 of these locations situated on the Island of Savaii with the remaining 5 sites located on the Island of Upolu.

The statistical data given below in Tables 1 and 2 represents coral cover in inshore lagoon reserves. Table 1, the dominant coral growth forms are presented as by island region.

*Table 1. Summary of coral covers by the two major islands.*

	Upolu %	Savaii %
<b>Coral Damages</b>	10.41	15.06
<b>Live corals</b>	22.00	41.70
<b>Dead Corals</b>	1.148	0.62
<b>Dead Corals/Algae</b>	10.50	7.94
<b>Abiotic</b>	32.25	27.04
<b>Algae</b>	23.70	7.64
<b>Total %</b>	<b>100</b>	<b>100</b>

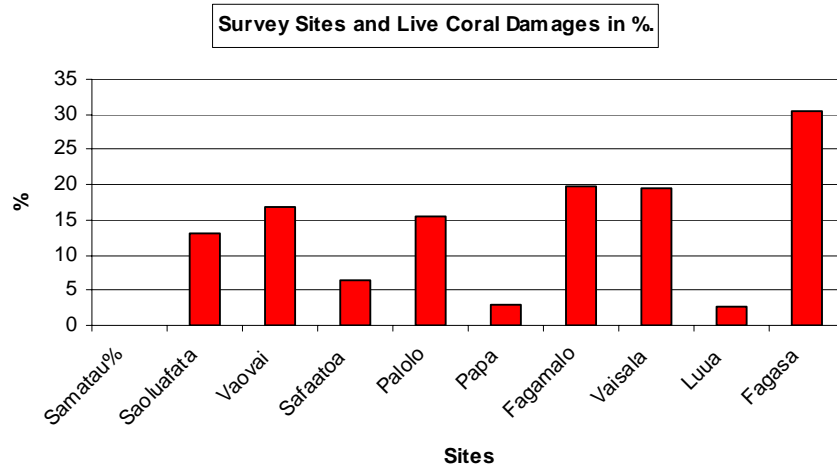
The coral reef monitoring in 14<sup>th</sup>-22<sup>nd</sup> January 2004 period had revealed that live corals were the dominant (about 41%) substrates in sites surveyed on Savaii Island. In sites on Upolu Island, it was noted that other forms of substrates such as sand, rubbles and rocks were the dominant substrate types. Dead corals and Dead corals with algae are substrates were noted to be more common on sites in Upolu accounted for about 1.2% , 10.5% than Savaii Island as represented by 0.6% and 7.9%. On sites assessed in Upolu Island, there seems that dead coral or rubble was the common substrate. Algae group were observed to be more common in Upolu sites than Savaii.

Apart from all other substrates, corals being observed damaged were mostly found in sites on Savaii Island comprising of about 15.1% whereas 10.4% on Upolu sites. In Table 2 below, presented the proportion of coral cover analysis of live corals, dead coral and damaged corals substrate status in each sites being surveyed on both Upolu and Savaii Island.

**Table1: The overall result from the survey carried throughout Upolu Island and Savaii Island is shown by the table below.**

Types	Samatau %	Saoluafata %	Vaovai %	Safaatoa %	Palolo Deep %	Papa %	Luuu %	Vaisala %	Fagamalo %	Fagasa %
<b>Coral Damages</b>	0	13.14	16.9	6.4	15.6	2.9	19.9	19.5	2.6	30.4
<b>Live Corals</b>	23.29	1.28	49.67	28.27	7.48	48.00	52.3	37.4	44.3	26.5
<b>Dead Corals</b>	0	0	2.2	1.6	1.94	0	0.6	0.3	2.2	0
<b>Dead Corals/ Algae</b>	7.48	3.52	6.8	12.8	21.88	4.6	7.3	3.8	21.8	2.2
<b>Abiotic</b>	36.54	60.27	14.5	20.5	29.44	34	8.4	35.9	20.1	36.8
<b>Algae</b>	32.69	21.79	9.93	30.43	23.66	10.5	11.5	3.1	9	4.1
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

There was not much damaged corals being observed on Upolu sites. Palolo, Vaovai and Saoluafata were all above 10% and below 20% damage. Fagasa reserve was the only outstanding coral damage found in Savaii which comprised of about 30.4% whereas Papa-Puleia was next with 29%. The rest found between 10% and 20%. See Figure 1 for further illustration.



**Figure 1: Shows % of Damaged Corals on the surveyed sites on Upolu and Savaii Islands.**

#### 4. DISCUSSION

Mulipola (2001) stated that Barrier lagoons around Samoa are shallow with depths of 2-3m and in some places up to 3km wide. This is accrued to deposition of runoff from the land in lagoons over time resulting in shallow lagoons with high amount of silt. Reef flats of barrier lagoons are generally not well endowed with corals however this is site dependent. The inner lagoons have little live coral cover and diversity. Damage to corals from anthropogenic causes may be imparted on higher population pressure on the island of Upolu. Apart from anthropogenic and population pressures on coral reefs, natural disasters including cyclones also affect corals but the damage is depending on how strong it is.

According to results being obtained, we have found out that there is not much damage caused by Cyclone Heta on our coral reefs. The small percentage of damage may suggest due to two days that Heta blew, unlike cyclone Ofa and Val in 1990-1991. The only sites being observed with damage corals are the sites which faced the wind direction and short lagoon areas including Fagasa and Papa-Palauli Savaii.

In summary, coral cover is not significantly widespread throughout both islands while dead coral was prevalent. The "Others" category represents algal substrate types which, was obviously higher in sites monitored on Upolu. This is an indication that coral reefs in sites on Upolu Island is still threatening and would continue to degraded by impacts from human, natural and coastal developments. However, several management attempts have been installed promoting coral reef conservation and management through community participation.

#### CONCLUSION

After the resurvey for the selected sites, we found out that there is little damage for the village reserve on islands.