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Marine Turtle Newsletter

Marine Turtles Stranded by the Samoa Tsunami

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The Samoa group of islands comprises American Samoa (territory of the United States of America) in the east and the independent State of Samoa (formerly known as Western Samoa) in the west. The Independent State of Samoa consists of two main and seven small islands. The two main islands, Savaii (land area approximately 1,820 km^2) and Upolu (land area approximately 1,115 km^2 and home of the capital city, Apia), and two of the small islands, Manono (land area approximately 5 km^2) and Apolima (land area approximately 2 km^2), are inhabited. All islands are volcanic in origin and lie in the south- west Pacific between latitudes 13° 25' S and 14° 05' S, and longitudes 171° 23' W and 172° 48' W. The most commonly occurring species of marine turtles in the Samoa Islands are hawksbill and green turtles (Craig 1993; Utzurrum 2002; Witzell 1974).

Figure 1. Map of Upolu island in the Independent State of Samoa, with locations of stranded

turtles from 2009.

On 29 September 2009, there was an earthquake and resultant tsunami waves that swept through parts of the Samoa Islands. These waves brought marine life with them, portions of which were stranded on land when the waves subsided, including reef fishes of varying sizes, marine turtles, a few sharks and dolphins. This paper gives an account on the number and fate of marine turtles known to have stranded after the tsunami waves on the island of Upolu (Fig. 1).

Most of the information was obtained from interviews with individuals in villages most affected by the tsunami. Flipper tagging, tissue sampling for DNA, measurements and data recording of turtles that were brought to Apia, or held by communities were conducted by DEC and SPREP representatives following standard techniques (Balazs *et al*. 1999; Bolten *et al*. 1999).

Date	Species	Location	Turtles	Fate
20-Sep	Green	Falealili?	1	Tagged and released
30-Sep	unknown	Maninoa	>2	Released
30-Sep	Green	Ulutogia	1	Unknown
30-Sep	unknown	Aleipata (village not identified)	1	Unknown
late Sept	unknown	Malaela	1	Released
1-Oct	Green	Aleipata, Malaela	4	Tagged and released
6-Oct	unknown	Malaela	1	Released
6-Oct	unknown	Lotofaga ?	1	Unknown
15-Oct	Green	Aleipata, Malaela	2	Tagged and released
15-Oct	unknown	Malaela	>10	Released
15-Oct	unknown	Malaela/Laulii	7	Escaped into flooded river
17-Oct	unknown	Vaovai	2	Released
29-Oct	Hawksbill	Tafitoala (consumed in Fusi Safata)	1	Consumed
29-Oct	Green	Tafitoala	12	Released
29-Oct	Hawksbill	Tafitoala	1	Released
??	unknown	Lalomanu	4	Released
??	unknown	Salesatele	1	Released
??	unknown	Malaela	<5	Dead and buried

Table 1. Marine turtles reported stranded on land after the Samoa Tsunami, September 2009.

At least 52 marine turtles (Table 1) were reportedly stranded on land. Seven were released by DEC/SPREP, at least forty one (including seven that were taken to another village but escaped to the sea after heavy rain caused flooding at the area where they were kept) were reportedly released by communities, government officials, resorts and individuals where they were found, one hawksbill was consumed (reportedly because its carapace was badly damaged and

deemed unlikely to survive) and the fate of three that were reported is unknown. In addition, <5 dead turtles were also reportedly buried at Malaela village.

Of the seven marine turtles released by DEC/SPREP, one was brought in by a construction worker, four were brought from the Police post at Malaela after arrangement by SPREP and DEC, and two were tagged at Malaela after the village found them in the mangrove area and held them in a small pond. All seven turtles tagged and released were green turtles. One of the turtles observed with an unknown fate was also a green. All of the thirteen turtles released at Tafitoala were described as having carapaces of the same colour and "smoothness" as the turtle that was consumed (hawksbill). However further questioning seemed to indicate that they could have been green turtles given they had reddish carapaces with no overlapping scutes, with the exception of one. Thus the vast majority of stranded turtles were green turtles.

Figure 2. Stranded green turtle being carried to the water by villagers in Malaela.

Carapace measurements were collected from eight turtles (seven released greens and one consumed hawksbill). Two green turtles, with curved carapace length (CCL) of 91.5 cm and 101.5 cm were adult sized and female (based on short tail length). The other released green turtles were between 50.0 and 90.5 cm CCL. The hawksbill turtle that was consumed was 100.0 cm CCL and female, based on short tail length. One of the turtles (a green) with an unknown fate, stranded at Ulutogia, may have been an adult, based on a photograph (Fig. 2). Of the 13 turtles released at Tafitoala, five were reported to be large while the other eight were sub-adults.

The highest numbers of stranded turtles reported were at Malaela, Aleipata (19+ turtles) followed by Tafitoala (13 turtles plus one consumed). Four stranded turtles were reportedly released in Lalomanu, at least two were released at Coconut Beach Resort at Maninoa, two released at Vaovai, Falealili and one at Salesatele.

Of the seven turtles tagged and released, one had major cracks on its carapace which may have resulted from handling when the turtle fell on a rock when it was being moved from a mangrove area to a small pond. Another green turtle also had a small crack in the centre of its carapace and abrasions on the tips of its front flippers. There were no signs of damage or trauma on the rest of the turtles observed although most had some mud covering their bodies. No information was obtained on the turtles released by communities or the dead ones that were buried at Malaela.

One of the two green turtles released at Malaela had been tagged previously. Records in the DEC turtle tagging database confirmed that this r turtle had been caught in a fishing net and was tagged and released at Satitoa, Aleipata, in October 2008.

The number of green turtles stranded on land is an indication of the importance of the green turtle foraging area around Aleipata. The stranding of a green turtle that was tagged and released at Satitoa Aleipata in October 2008 further illustrates the value of this foraging area for green turtles and suggests the presence of a foraging green turtle population in the area. The stranding of 13 turtles, including juveniles, in Tafitoala Safata may also indicate a foraging area there.

Although we know of >50 sea turtles that were stranded on the island following the tsunami waves, there may have been more that were pushed on land but were able to swim or crawl back to the sea when the waters receded, particularly in areas where there were no barriers blocking their return.

The successful recovery and release of the stranded turtles was due largely to the action of the communities and the general public at large, and may be a reflection of the success of the campaigns to conserve turtles in Samoa. In particular, the Marine Protected Areas (MPA) work in both districts of Safata and Aleipata on Upolu Island seems to have contributed significantly to the high numbers of stranded turtles being released back to the sea. For example, the first stranded turtle that was tagged and released was brought to the home of the MPA officer near Apia by a construction worker because he knew turtle conservation was part of the officer's tasks. The other four turtles tagged and released were held by Police Officers posted in one of the affected villages and communication with Secretariat of the Pacific Regional Environment Programnme (SPREP) lead to these being brought in for tagging and then releasing. The other two turtles that were tagged and released were kept by a village in the Aleipata District MPA. The release of other turtles for which no information was recorded is believed to be linked to the successful campaign during recent years and positive response of the communities and individuals to conserve marine turtles. The highest numbers of stranded turtles reported were at Malaela, Aleipata (19+ turtles) followed by Tafitoala Safata (13 turtles). Both villages are in the MPA programme and this fact could have contributed to the high reporting at these sites. In addition, the areas in both villages have inland waterways

and surrounding vegetation, i.e. mangrove areas. Thus when the waves subsided turtles may have been more susceptible to becoming "trapped" inside the mangrove areas.

Only one turtle, a hawksbill, was reported and confirmed to have been consumed. This was also done because the turtle concerned had serious damages to its sides and considered unlikely to survive if released. Hawksbills in certain locations in the Pacific Islands, including Samoa, are at times known to be toxic (for a review, see Aguirre *et al*. 2006).

The villager who found and released the turtles at Tafitoala was not able to determine whether they were green or hawksbill turtles. Thus points to another need for turtle awareness campaigns, i.e. turtle species identification, especially on differentiating the two most common species in Samoa, greens and hawksbill.

These events have led to prioritizing certain actions related to marine turtle conservation in Samoa, including:

- Determine the extent of turtle foraging areas around Aleipata and possibly Safata and the tsunami-related impacts on turtle foraging habitat. If baseline information on this habitat is not available, the survey would be critical in establishing baseline information. This could be the first step towards the identification of major turtle foraging areas in Samoa, which is one of the three main objectives under the Theme, "Research", in the SPREP regional Marine Turtle Action Plan 2008-2012.

- Continued turtle nest monitoring on the major hawksbill nesting beaches, especially around the Aleipata area including the offshore Islands.

- Continued turtle conservation awareness campaigns including species identification using simple external characteristics such as shape of the beak and scales on the head.

- Possible establishment of a turtle monitoring network in communities involved in MPAs, as part of the turtle conservation programme that is highlighted in the MPA Management Plans.

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