Marine turtle stranding and nesting in Malita, Mindanao, Philippines

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ABSTRACT
Marine turtle stranding and nesting from April 9, 2004 to June 23, 2009 were the focus of the investigation. It involved recording and compilation of marine turtle stranding and nesting, conducting of tagging and participating in the stock enhancement through subsequent release of turtles to the sea. Seventeen adult marine turtles were tagged and released. A total of 296 hatchlings were also released. Four species of marine turtles were observed in the coastal waters of Malita, Davao del Sur, namely: olive ridley *(Lepidochelys olivacea)*, hawksbill *(Eretmochelys imbricata)*, green turtle (*Chelonia mydas)* and the leatherback *(Dermochelys coriacea)*. Hawksbill and the olive ridley obtained the highest recorded stranding followed by the green turtle. The rarest stranding was that of the leatherback. Higher strandings were observed during the warmer months of March, April, May and September. Strandings were low for the colder months of December, January and February. Lower hatching and survival rate were observed for turtle eggs that were transferred to drier areas.

KEYWORDS: stranding, nesting, marine turtle, tagging

INTRODUCTION

The increasing number of the endangered aquatic species including the sea turtles has become a global concern. The indiscriminate exploitation by man of the aquatic species' populations for commercial gains has led to the species' decreasing populations (SEAFDEC Report, 2008). All species of sea turtles are included in the Red List of Threatened Animals of 1996 and are classified as endangered (IUCN, 2004).

The Southeast Asian region is one which has the highest biodiversity and the richest marine ecosystems in the world. Six of the seven species of marine turtles are found in the region.

Global warming and climate change are issues that we have to address including their profound influence on biodiversity. The endangered marine turtles may not be spared from the effects of climate change. To ensure sustainability of these resources amidst the effects of climate change, specific aspects of their life characteristics and behavior may be investigated. Hence, nesting and stranding of marine turtle in Malita, Mindanao, Philippines and the circumstantial impact of climate change in the aspect of rising sea level is also included. Specifically it aimed to a) provide baseline information, recording and compilation of marine turtle stranding and nesting b) build awareness and exchange of information through conduct of tagging on stranded turtles (whenever applicable) and c) participate in the global stock enhancement of sea turtles through release of stranded turtles and hatchlings to the sea.

The information derived from this study are essential in building awareness and exchange of information and experiences essential in achieving success for the initiatives on the conservation and management of sea turtles.

MATERIALS AND METHODS

A. Recording of the Stranding/ Nesting incident

Whenever marine turtle stranding/nesting occurred, a record of the incident was prepared using the Department of Environment and Natural Resources – Protected and Wildlife Bureau (DENR-PAWB) form. The location with reference to the lowest tidal mark was noted. If nesting occurred in an area where it could be reached by water during high tide, the eggs were transferred to a much safer/drier area. Whenever possible, the number of eggs laid, hatching rate, number and condition of hatchlings and all observations that were worth noting down were recorded.

B. Tagging (if applicable)

Stranded turtles without tags having a carapace width of 20 cm above were tagged using the tag provided by PAWB-Philippines. Tagging procedures provided by DENR-PAWB were observed.

C. Release of the turtle

After tagging, the turtles were released back to the sea. Eggs that were laid on the shore were monitored and the active hatchlings were also released immediately after they had hatched. Those that emerged and were not able to crawl and climb to the top of the nest underwent rehabilitation and were released at a little later.

RESULTS

Records of marine turtle strandings considered in this study were those from April 9, 2004 to June 23, 2009. Results (Table 1) showed that strandings were observed along the coastal areas of Malita, Davao del Sur. For the period from April 9, 2004 to June 23, 2009, a total of 24 turtle strandings were recorded. The same number were released back to the sea, however only 17 of these were tagged. A total of 296 hatchlings were released to the sea.

Species distribution and monthly strandings

Of the seven species of sea turtles found in the Southeast Asian region, four were observed in the coastal waters of the municipality of Malita, Davao del Sur. These are: the olive ridley *(Lepidochelys olivacea)*, hawksbill *(Eretmochelys imbricata)*, green turtle (*Chelonia mydas)* and the leatherback *(Dermochelys coriacea)* as presented in Table 2. Highest strandings observed were that of the hawksbill (10) and the olive ridley (10). The rarest stranding was that of the leatherback. Highest strandings occurred in the coasts of Balabagan, Bacolod, Tamburong and Talisay (Table 2). Strandings and nesting of all four species: olive ridley *(Lepidochelys olivacea)*, hawksbill *(Eretmochelys imbricata*, green turtle (*Chelonia mydas)* and the leatherback *(Dermochelys coriacea)* were also observed in the coasts of Balabagan, Bacolod, Tamburong and Talisay. Incidentally, these areas are sitios of New Argao where high occurrence of dugong is also reported (Lucero, 2009). However, conclusive statements on the possible association of the co-existence of dugong and turtles in these areas need to be ascertained.

Data derived from April 2004 to June 2009 as presented in Table 3 showed that higher occurrence was observed during the warmer months of March, April, May and September. Strandings were low for the colder months of December, January and February.

Marine turtle nesting and hatching

Data on turtle nesting and hatching are presented in Table 4. It has to be noted that there were cases when the eggs laid were transferred to a safer place, farther from the lowest tide mark to prevent the eggs from being washed with seawater during high tide. Results showed that the eggs that were not disturbed by transferring gave higher hatching rates from 72.97% to 91.85%. The survival rate of newly hatched eggs (hatchlings) was also high (84.38%- 100%). The eggs that were transferred farther from the lowest tide mark showed a much lower hatching rate (0-20.38%) and a survival rate of 0.00%- 52.38%. A total of 296 hatchlings were released to the sea.

Examination of the unhatched eggs showed that ants preyed on the eggs. It was also observed that both for the transferred and not transferred eggs, roots of coconut trees distorted the eggs and provided convenient portals for the entry of ants resulting in the destruction of the eggs.

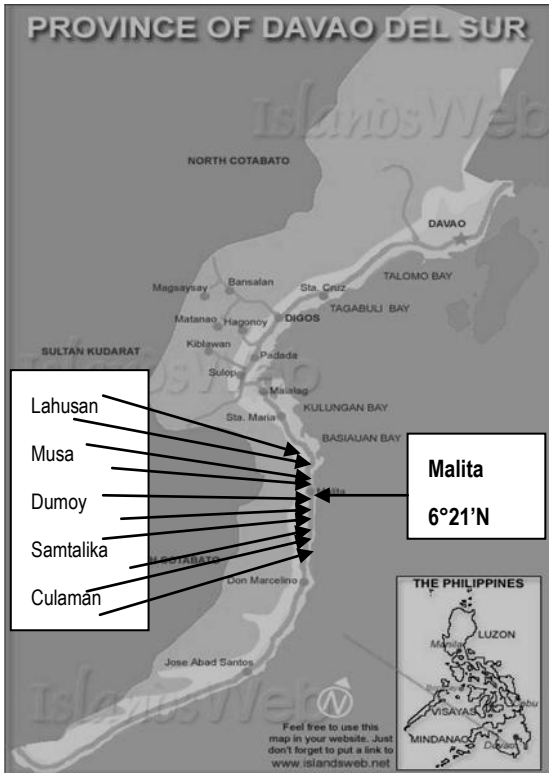

Fig. 1 Map showing the stranding sites

DISCUSSION

The presence of four of the seven species of sea turtles namely: olive ridley *(Lepidochelys olivacea)*, hawksbill *(Eretmochelys imbricata)*, green turtle (*Chelonia mydas)* and the leatherback *(Dermochelys coriacea* in the coastal waters of Malita, Davao del Sur (Figure 1) indicates the still rich biodiversity in the area.

The approximately 10 km coastal stretch where turtle stranding and nesting occurred is considered a nesting site of sea turtles. However, the increased coastal/ shoreline utilization for residential purposes, makes sea turtles more vulnerable to destruction. More nestings during the warmer months of March, April, May

and September occurred. The data of the time of nesting is essential in forecasting reproductive population aspects of the life of marine turtles. Transferring of the eggs to a much safer place disturbed the natural process of incubation and had affected the hatching rate of the eggs. However, granting that the eggs were not disturbed, the waves will still wash the eggs away and will pose 0% survival. This study has contributed to the stock enhancement program of turtles by releasing a total of 296 hatchlings to the sea.

The sea level rise is crudely evident by the loss of 3-4 rows of coconut trees planted 10m apart along the shoreline where turtles used to nest in the last 3 decades. This reduced the drier areas where turtles could nest. Since turtles nest on land, they have to move inward to the land but may be prevented from doing so because of existing coastal shield and protection seawall built along the coasts.

Table 1 Record of turtle stranding and tagging

Date of stranding	Species	Location	T (Tagged) NT (Not Tagged)	Number of turtles released
04/29/2004	Olive ridley	Balabagan	NT	1
09/1/2004	Hawksbill	Talisay	T	1
9/17–18/2004	Hawksbill	Talisay	T	1
9/18/2004	Green	Culaman	T	1
10/30/2004	Hawksbill	Talisay	T	1
11/9/2004	Hawksbill	Talisay	T	1
01/29/2005	Hawksbill	Talisay	T	1
03/1/2005	Olive ridley	Talisay	T	1
04/19/2005	Olive ridley	Lahusan	NT	1
05/18/2005	Green	Bacolod	NT	1
05/25/2005	Olive ridley	Balabagan	NT	1
09/24/2005	Olive ridley	Balabagan	T	1
01/13/2006	Olive ridley	Tingolo	T	1
07/8/2007	Hawksbill	Talisay	NT	1
07/25/2007	Leatherback	Talisay	NT	1
09/2/2007	Olive ridley	Balabagan	T	1
09/4/2007	Olive ridley	Tamborong	T	1
10/16/2007	Hawksbill	Bacolod	NT	1
11/29/2007	Hawksbill	Musa	T	1
02/11/2008	Olive ridley	Bacolod	T	1
05/1/2008	Green	Dumoy	T	1
11/26/2008	Hawksbill	Lahusan	T	1
05/07/2009	Olive ridley	Samtalika	T	1
06/23/2009	Hawksbill	Tamburong	T	1
Total				24

Table 2 Marine turtle species distribution and location of stranding

Location of stranding	SPECIES				Number of species
	OR	H	G	L	
Lahusan	1	1			2
Musa		1			1
Dumoy			1		1
Samtalika	1				1
Culaman			1		1
Balabagan	4				1
Bacolod	1	1	1		3
Tamburong	1	1			2
Talisay	1	6		1	3
Tingolo	1				1
Total stranding	**10**	**10**	**3**	**1**	

Legend: OR– Olive Ridley *(Lepidochelys olivacea);* H – Hawksbill *(Eretmochelys imbricata);* G – Green turtle (*Chelonia mydas);* L – Leatherback *(Dermochelys coriacea)*

Table 3 Comparative data on monthly strandings for the year 2004-2009

		Jan	Feb	Ma	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2004	OR				1									1
	H									2	1			3
	G									1				1
2005	OR			1	1	1								3
	H	1												1
	G					1								1
2006	OR	1												1
	H													0
	G													0
2007	OR									2				2
	H							1			1	1		3
	G													0
	L							1						1
2008	OR		1											1
	H											1		1
	G					1								1
2009	OR						1							1
	H						1							1
	G													0

Table 4 Data on nesting and hatching

	Not transferred				Transferred	
DN	Mar 5, 2005	No data	No data	Jul 8, 2007	Apr 29, 2004	Sept 4, 2007
DH	Apr 23, 2005	Mar 18, 2005	July 24, 2005	Sept 16, 2007	June 16, 2004	
IP	53 days			70 days	48 days	
S	OR	OR		H	OR	OR
NEL	111	70?		135	103	30
HE	81	64		124	21	Eggs des-troyed by ants
D	4	10		0	10	
A	77	54?	30	124	11	
HR	72.97 %	91.42%		91.85%	20.38 %	0.00%
SR	95.06 %	84.38%		100 %	52.38 %	0.00%
NHR	77	54	30	124	11	0

Legend: DN-Date Nested; DH-Date hatched; IP-Incubation Period; S-Species; NEL-Number of Eggs Laid; HE –Hatching efficiency; D-dead; A-alive; HR-hatching rate; SR-Survival rate; NHR-Number of hatchlings released

CONCLUSION.

Based on the study, the following conclusions were derived:

1. Four species of sea turtles, namely: olive ridley *(Lepidochelys olivacea)*, hawksbill *(Eretmochelys imbricata)*, green turtle (*Chelonia mydas)* and the leatherback *(Dermochelys coriacea)* are found in the study area.
2. The coastal areas from Lahusan to Tingolo of Malita, Davao del Sur are nesting sites of marine turtles.
3. A total of 24 adult turtles, 17 of which were tagged and 296 hatchlings were released to the sea.

RECOMMENDATIONS

Based on the study, it is recommended:

1. That with the presence of the four species of sea turtles in the area, a more enhanced conservation program be implemented, involving more participation of the local folks.
2. To consider the possibility of establishing a marine turtle hatchery
3. That capability training on marine turtle hatchery be conducted in support to the conservation program.
4. That multiplication of conservation initiatives on turtles and other marine resources be expanded to other areas within a unified plan of action.

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