

Tagging Study on Green Turtle (*Chelonia mydas*) at Thameehla Island, Myanmar

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ABSTRACT

Sea Turtle Conservation and Management Activities have been carried out in Myanmar since 1986. Thameehla Island is a major nesting area for green turtles. Inconel tagging on green turtle (*Chelonia mydas*) experiment was conducted at Thameehla Island, Ayeyarwady Division, Myanmar in 2002. The nesting population and tags recovered were recorded. The results of this study showed that only 21.82 % of the nesting turtles could be tagged during the study period. Out of 280 green turtles that had been tagged at Thameehla Island from 2002 to October 2008 only 58 individuals had re-migrated up to 2008. This indicates that only 20.71 % of green turtles had returned to Thameehla Island. Ninety three frequencies of tagged turtles had re-migrated to Thameehla Island. Out of 63 tagged turtles recovered from 2002 to October 2008, 33 green turtles nested at Thameehla Island. Even though we cannot draw any significant conclusion, the collected data would help understand the basic ecology of sea turtles around Myanmar.

KEYWORDS: Thameehla Island, green turtle, inconel tagging, tag recovered, nesting population

INTRODUCTION

The population of sea turtle is distinctly and drastically decreasing year after year due to taking the meat and eggs, and incidental catch by fishing gear. Habitats, feeding grounds and beaches are also degraded by human activities and natural impacts. Sea turtles are considered as vulnerable to extinction by the World Conservation Union (IUCN) and listed in IUCN red list as threatened species. Sea turtles are also mentioned as endangered species in the Convention on the Conservation of Migratory Species (CMS) Appendix 1. The Department of Fisheries Myanmar has been conducting nest translocation and research activities since 1986 but systematic conservation and management activities started around 1997. Myanmar agreed to conserve sea turtles and its nesting beaches and enacted the Laws such as Myanmar Marine Fisheries Law (1999) and Myanmar Wildlife Law (1994). Conservation activities such as protection from human disturbance, illegal harvest and hunting were conducted by the Ministry of Livestock and Fisheries.

Nowadays, Myanmar is one of the signatory states of CMS and the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA-MoU). Myanmar is also a member country of the

Southeast Asian Fisheries Development Center (SEAFDEC). (Maung Maung Lwin and Khin Myo Myo, 2003)

Green turtle (*Chelonia mydas*) is one of the 5 sea turtle species recorded nesting in Myanmar coastal areas; Ayeyarwady delta area, Rakhine coastal area, Mon coastal area and Tanintharyi coastal area.

Green Turtle (*Chelonia mydas*) is one of the turtle species which are known to nest and forage in Myanmar. Green Turtles are found foraging near Thameehla Island indicating it to be a favorable habitat around Thameehla Island. (Maung Maung Lwin, 2008)

Historically tagging has been the single most valuable activity in advancing our understanding of sea turtles and their conservation needs in relation to complex life cycles, reproductivemigrations, slow growth rates(for some species), and delayed sexual maturation. In many cases, a commitment to years of systematic tagging is necessary to achieve certain objectives (Balazs, 1999).

However, in some instances the tagging of even a few turtles, particularly at nesting beaches where tagging has never been conducted, can yield valuable insight into migrations and the locations of resident foraging areas.

Thameehla turtle nesting Island is protected by the Ministry of Livestock and

Fisheries as an all year round nesting site. Thameehla Island is a major nesting site of green turtles in Myanmar. Green turtle is the predominant species in Thameehla Island. The Department of Fisheries conducts transplanting of threatened nests. Some nests are threatened in nature due to floods, roots of plants, crabs and sand loss, which naturally occur at the nesting site. In the year 2001, Applicators and Inconel Tags were provided by Southeast Asian Fisheries Development Center (SEAFDEC)-Marine Fishery Resources Development and Management Department (MFRD MD) so that research on sea turtle could be carried out using tagging technology. The Applicators and Inconel tags (National Band and Tag Co., USA) received from MFRDMD were sent to Thameehla Island Conservation and Management Station.

The objective of this study was to accumulate information of the ecology of green turtle (such as reproductive biology, movement, stranding and growth rates) in Thameehla Island by tagging the turtles.

MATERIALS AND METHODS

Thameehla Island (Diamond Island) of Ngaputaw Township, Ayeyarwady Division is the year round nesting area for sea turtles. The area of Thameehla Island is one mile in length and half mile in breadth. It is situated at $15^{\circ} 5' 1.30''$ N and $94^{\circ} 17.30'$ E (Fig. 1 & 2)

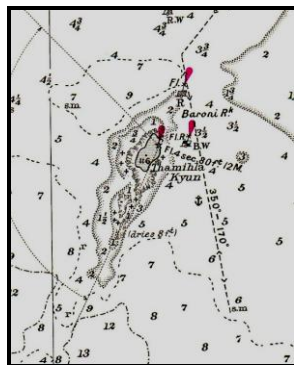


Fig. 1 Map of Thameehla Island



Fig. 2 Situation of Thameehla Island

The Inconel tagging on green turtle (*Chelonia mydas*) study was conducted at Thameehla Island from 2002 to October 2008.

Two Inconel Tags were used and fixed to each turtle on both flippers (left and right flipper). Four departmental staff took part in this study. Sea turtles were tagged during the study periods and monitoring was also made to record the landing frequency of individual sea turtle recovered and nesting population.

In Myanmar, Turtle Conservation and Management Training Courses were conducted in which theory and practical application of tagging activities were included. The Department of Fisheries distributed Tag Wanted Posters, Turtle Conservation and Management Educational Posters and Pamphlets which contained information about tagging activities.

RESULTS

A total nesting population of 1283 was recorded at Thameehla Island during the period from 2002 to 2008. In Thameehla Island 280 green turtles were tagged utilizing Inconel Tags during the study period. Among 280 tagged turtles 130 turtles laid eggs (Table 1 and Fig. 3).

Table 1 Tagged turtle number, landing and nesting at Thameehla Island

Year	Nesting population	Tagged		
		Total no. of turtles tagged	Nesting turtles (Nos.)	Landing only (Nos.)
2002	122	41	6	35
2003	243	49	32	17
2004	240	32	21	11
2005	282	60	29	31
2006	138	30	8	22
2007	145	46	24	22
2008 (Oct)	113	22	10	12
Total	1283	280	130	150

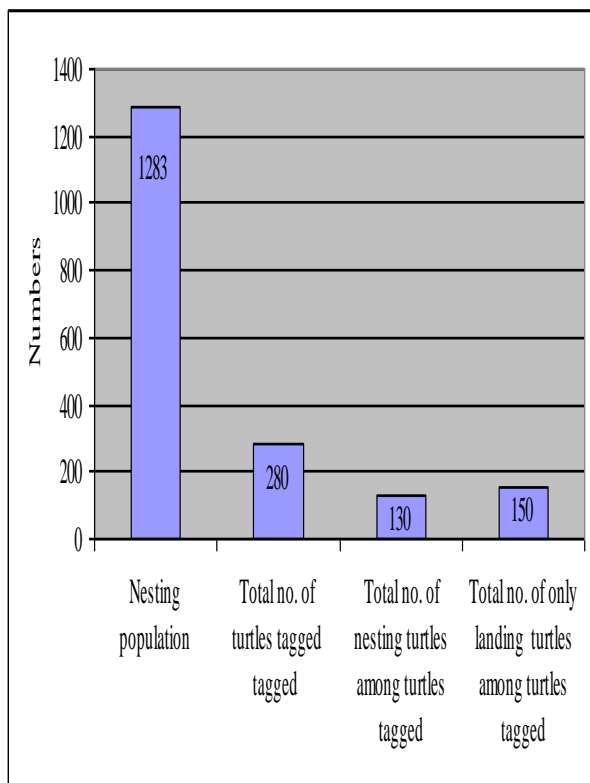


Fig. 3 Tagged turtle number, landing and nesting at Thameehla Island

One hundred and fifty landing tagged turtles which did not lay eggs were recorded. Frequency of tagged turtles recovered during the study period was 93. Forty - six tagged nesting turtles were recorded. Out of 93 frequencies of tagged turtle recovered 63 tagged landing turtles were observed. (Table 2,3,4 and Figure 4)

Table 2 Tagged turtle and frequencies of tagged turtles recovered.

Year	Tagged Turtle Nos.	2002	2003	2004	2005	2006	2007	2008	Total
2002	41	1							
2003	49		9						
2004	32			14					
2005	60				24				
2006	30					1			
2007	46						40		
2008	22							4	
Total	280								93

Table 3 Tagged turtle and number of tagged turtle recovered

Year	Tagged Turtle Nos.	2002	2003	2004	2005	2006	2007	2008	Total
2002	41	1							
2003	49		7						
2004	32			10					
2005	60				18				
2006	30					1			
2007	46						22		
2008	22							4	
Total	280								63

Table 4 Total numbers and frequencies of turtles landed and nesting

Year	Total no. of tagged turtles	Tagged turtles recovered			
		Total no. of turtles landed	Total no. of nesting turtles	Total frequencies of landed	Total frequencies of nesting
2002	41	1	1	1	1
2003	49	7	5	9	7
2004	32	10	8	14	10
2005	60	18	5	24	7
2006	30	1	-	1	-
2007	46	22	11	40	18
2008	22	4	3	4	3
(Octo					
Total	280	63	33	93	46

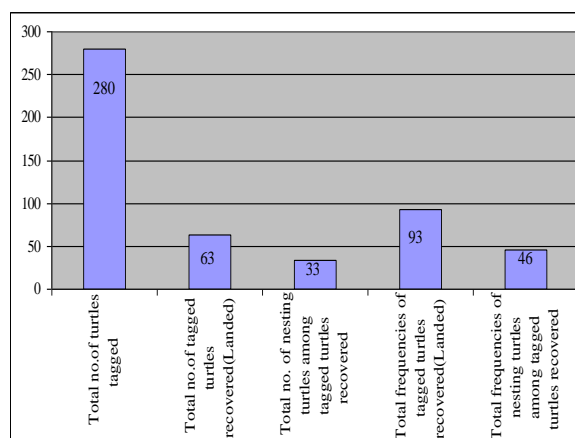


Fig. 4 Total numbers and frequencies of turtles landed and nesting

Recovered tagged turtle frequencies and related tag numbers on Thameehla Island from 2002 to October 2008 are shown in Table 5.

Table 5 Recovered tagged turtle frequencies and related tag numbers

Sr. No	Tag Number (MM)	Year of Tagged	Frequencies of tagged turtle recovered						Total	
			2002	2003	2004	2005	2006	2007		2008
1	1049-1050	2002					1		1	
2	1065-1066		1						1	
3	1069-1070						5		5	
4	1079-1080							1	1	
5	1143-1144	2003		1					1	
6	1147-1148			2					2	
7	1149-1150			2					2	
8	1231-1232			1					1	
9	1239-1240			1					1	
10	1241-1242			1			1		2	
11	1245-1246			1			2		3	
12	1271-1272	2004			3				3	
13	1281-1282			1					1	
14	1283-1284			1					1	
15	1285-1286			1	1				1	
16	1289-1290			1					1	
17	1293-1294			2					2	
18	1295-1296			1					1	
19	1299-1300			2					2	
20	1509-1510			1	1				2	
21	1513-1514			1	1				2	
22	1515-1516				1		1		2	
23	1527-1528				3				3	
24	1519-1520				1				1	
25	1533-1534	2005			1				1	
26	1535-1536				1				1	
27	1537-1538				1				1	
28	1539-1549				4				4	
29	1540-1541				1				1	
30	1544-1545				2				2	
31	0901-0902				1				1	
32	0913-0914				1				1	
33	0923-0924				1				1	
34	1587-1588				1				1	
35	1589-1590				1				1	
36	0978-0979				1				1	
37	0998-0999				1				1	
38	0651-0652	2007					1		1	
39	0975-0660						3		3	
40	0674-0675						1		1	
41	0679-0680						1		1	
42	0683-0684						2		2	
43	0687-0688						1		1	
44	0691-0692						2		2	
45	0694-0695						1		1	
46	0699-0700						2		2	
47	1703-1704						1		1	
48	1705-1706						1		1	
49	1708-1709						3		3	
50	1711-1712						3		3	
51	1713-1714						2		2	
52	1715-1716						3		3	
53	1710-1718						1		1	
54	1707-1717						2		2	
55	1728-1729							1	1	
56	1722-1723						1		1	
57	1742-1743	2008						1	1	
58	1744-1745							1	1	
	Total		1	9	14	24	1	40	4	93

In Thameehla Island, out of 280 turtles tagged from 2002 to 2008, 58 individual tagged turtles re-migrated during the study period (Table 5). 63 tagged turtles returned to the same nesting Island where only 33 turtles were recorded as nesting turtles. 96 frequencies of tagged turtles

were recovered in which 46 frequencies of nesting were recorded during the study period.

DISCUSSION

Only 21.82 % of the nesting turtles could be tagged during the study period because of insufficient man power for night patrolling.

20.71% individual tagged turtles re-migrated during the study period. 22.50% tagged turtles and 33.21% frequencies of tagged turtles were recovered during the study period.

Monitoring measures should be further strengthened. The tagged turtles might also migrate to other remote areas or killed for many reasons. The incidental capture of sea turtles in fishing gear is a very serious threat to sea turtle and is blamed for major population decline. Shrimp trawlers have been singled out as a major threat to sea turtles (Chark, 2003).

Among 63 tagged turtles recovered, 33 turtles laid eggs. It indicated that 52.38 % of green turtle came back for nesting at Thameehla Island during the study period. 49.46 % frequencies of tagged turtles came back for nesting at the same nesting area.

Nesting turtles usually return to the same beach or Island to lay several clutches within one nesting season (Limpus, 1993). After two to eight years, many of these females will make another breeding migration, each generally returning to nest on the same beach as before (Limpus, 1993), Genetic and tagging studies suggest that the females return to breed in the same region as her birth. For example, a turtle born in Terengganu should return to breed in Terengganu when it grows up, but not necessarily to the same site of the beach (Limpus, 1993)

Tagging activities in Myanmar can be said to be in the infant stage. Even though the monitoring and study of tagged turtles lasted more than five years. The present study on the tagged turtles could not support a complete conclusion. Research on sea turtles utilizing tagging methodology started a few years ago and it requires time to draw conclusions. Although systematic data on foraging activities of green turtles around the Island could not be recorded, it could be assumed that the turtles foraged around Thameehla Island all year round.

Sea turtles are widely distributed in tropical and subtropical waters in the world. Recently, incidental kill of sea turtles by fishing was noticed. In Myanmar, sea turtles were also killed by improper fisheries. Thus effective education programs should therefore be developed to strengthen the conservation activities. In monitoring to obtain data on recovered turtles, difficulty occurred because of insufficient

patrolling staff at the conservation station. Most of the local people who live in coastal fishing areas have no experience and poor knowledge in sea turtle conservation and protection. Thus, fishermen and local people should be organized and educated to cooperate and participate in sea turtle conservation and protection activities. Research on the sea turtles using tagging methodology started a few years ago and it needs more time to make conclusions from the data analyzed.

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