

ANDAMAN & NICOBAR SEA TURTLE PROJECT

Report, Phase VI A

RPT  
BHA/70800

Submitted by Satish Bhaskar, March 1995.

Objectives : To help conserve and manage sea turtle populations in the Andaman and Nicobar Islands by

1. Locating prime nesting and feeding areas.
2. Monitoring population trends.
3. Identifying threats to sea turtle populations.

Period covered by Phase VI A : 5-11-94 to 16-12-94.

Period of actual field studies : 16-11-94 to 7-12-94 (3 weeks).

Investigator : Satish Bhaskar.

Introduction : Field work consisted of two parts of unequal duration :

1. The first was a quick nest-count survey of three uninhabited islands - Snark, Kwangtung and Latouche - on 16 November 94.
2. The second was a three-week survey and study on uninhabited South Reef Island, and included a tagging operation, as was done on earlier occasions. The study spanned the period 17 Nov 94 to 7 Dec 94, and can be considered to have been a continuation of the tagging studies undertaken on South Reef earlier during the same nesting season for the hawksbill turtle i.e. those done between 27 June 94 and 9 September 94 (see report, Phase VI).

FINDINGS

Table 1. Number of nests\* made by hawksbills and green turtles on four important nesting islands.

( \* Nests include those associated with sets of visible tracks and also those in which associated tracks had been obliterated by wind, rain and tides.)

Island	Date(s) of survey	Species			
		Hawksbill		Green turtle	
		Nests	Tracks** visible	Nests	Tracks** visible
Snark	16 Nov 94	30	13	15***	4
Kwangtung	16 Nov 94	57***	3	2	0
Latouche	16 Nov 94	6	0	1	1
South Reef	28 June to 7 Dec 94	120	149****	42***	38****
Total		213	175	60	43

\*\* Tracks visible include non-nesting crawls as well as those associated with nests.

\*\*\* The figures for hawksbill nests on Kwangtung island and for green turtle nests on Snark and South Reef included a substantial proportion inferred solely from the presence of craters. The craters at hawksbill nest sites had been made by predatory monitor lizards (Varanus salvator) and by humans. Craters at green turtle nest sites had been made by the turtles themselves. A few of the craters may not have been associated with nests.

\*\*\*\* The extended periods of surveys on South Reef account for the large numbers of visible tracks ( Data includes Phase VI findings).

Data from tagging of hawksbills :

- Four hawksbills nested on South Reef island during the 21-day period 16 Nov to 7 Dec 94. Three of these were encountered and tagged. None carried tags from previous years.
- The four hawksbills came ashore 10 times (a cumulative total) and made 6 nests during this period. The proportion of non-nesting crawls was therefore 40% of total crawls.
- Two renesting intervals - of 13 and 14 days - were recorded.

Data from tagging of green turtles :

- Two green turtles nested on South Reef during the study period. Both were tagged. Neither carried tags from previous years.
- The two green turtles made 4 nests during this period. They also made 2 non-nesting crawls totally. The proportion of non-nesting crawls to total crawls was therefore 33%.
- Two renesting intervals - of 10 and 14 days - were recorded.
- The turtle that renested in 10 days, which was tagged with a tag carrying the number 023 X , was the largest green turtle recorded nesting in the Andarans so far, at 104 cm Standard carapace curved length (SCCL) and 90½ cm Standard carapace curved width (SCCW).

Egg sizes of hawksbills :

- Ten eggs randomly selected from each of 9 nests made by different hawksbills were measured during Phases VI and VI A. The largest 'normal' egg measured 36.5 mm in major diameter (i.e. along the major axis) and the smallest, 32.35 mm. An abnormal,

strongly ellipsoidal egg that measured 40 mm in major diameter and 35.65 mm along its greatest minor axis was, however, the largest egg measured.

- Six of the 9 hawksbills mentioned above were measured. The smallest one, measuring 68 cm/59 $\frac{1}{4}$  cm SCCL/SCCW laid the smallest eggs, that averaged 32.9 mm in major diameter. The largest eggs (that averaged 38.0 mm) were not laid by the turtle having the greatest SCCL - it was only the third longest - but at 75 $\frac{1}{4}$  cm SCCW this hawksbill had the greatest girth among the six turtles (Table 2). Average egg size and SCCW appear to be approximately linearly correlated (see graph, page 6). A larger sample size is required in order to confirm this. The slope of the graph suggests that for every increase of 5 cm in a hawksbills SCCW, egg size increases by about 1 mm.
- The size of hawksbill eggs ranged from 32.35 mm to 40 mm in major diameter (as was mentioned above) and averaged 35.1 mm (n=90 eggs from a total of 9 clutches).

Nesting season of the hawksbill turtle on South Reef Island :

Though the hawksbill in the Andamans is known to nest in all months of the year, it is clear from Table 5 that on South Reef, its main nesting season in 1994 commenced on about 1 July and ended on 23 November. This was a year in which the monsoons in the Andamans were unusually heavy. Nesting intensity peaked during the first eight days of September, when 20 nests were made, as was stated in the Phase VI report.

Table 2. Egg sizes of hawksbills, South Reef island.

Tag no./nos. on turtle	SCCL (cm)	SCCW (cm)	Range of max. dia. of 10 eggs (mm)	Avg. max. dia. of 10 eggs (mm)	Sample S.D. (mm)
CA 705	79½	75¼	35.15-40.0	38.0	0.33
CA 721* CA 724	81½	74½	33.9 -36.35	35.8	0.73
CA 708* CA 710	81½	74¼	33.95-36.5	35.0	0.92
022 X	78	73¼	35.1 -35.85	35.5	0.28
020 X	77¼	68½	33.9 -35.1	34.4	0.33
021 X	68	59¾	32.35-33.85	32.9	0.40
Untagged turtle 'A' (nested on 19-7-94)			33.85-35.45	34.9	0.43
Untagged turtle 'B' (nested on 25-7-94)			34.05-34.9	34.5	0.28
Untagged turtle 'C' (nested on 3-9-94)			34.75-36.25	35.5	0.54
Overall figures	77.6**	70.9**	32.35-40.0***	35.1***	1.46***

\* Double tagged turtle.

\*\* Average value for 6 turtles.

\*\*\* Values pertaining to 90 eggs, 10 eggs per clutch, from a total of 9 clutches.

Table 3. Renesting intervals of hawkshills tagged at South Reef, 1994, Phase VI A.

Tag no. of turtle	Date of tagging	Dates seen on beach	Renesting interval (days)	SCCL (cm)	SCCW (cm)
020 X	18/11	17/11*, 18/11	-	77 $\frac{1}{4}$	68 $\frac{1}{2}$
021 X	22/11	21/11*, 22/11, 4/12*, 5/12	13	68	59 $\frac{3}{4}$
022 X	23/11	23/11, 7/12	14	78	73 $\frac{1}{4}$

\* Non-nesting crawl.

Table 4. Renesting intervals of green turtles tagged at South Reef, 1994, Phase VI A.

Tag no. of turtle	Date of tagging	Dates seen on beach	Renesting interval (days)	SCCL (cm)	SCCW (cm)
019 X	17/11	16/11*, 17/11, 1/12	14	91	82
023 X	24/11	24/11*, 24/11, 4/12	10	104	90 $\frac{1}{2}$

\* Non-nesting crawl.

Table 5. Nesting intensity of hawksbills, South Reef, 1994  
( updated from Phase VI report).

Month	Period	No. of days	No. of nests	Avg. no. of nests per day	No. of days	No. of nests	Avg. no. of nests per day
June	28-30	3	1	0.33	3	1	0.33
July	1- 7	7	5	0.71	31	23	0.74
	8-15	8	2	0.25			
	16-23	8	8	1.00			
	24-31	8	8	1.00			
Aug	1-24	24	24	1.00	31	31	1.00
	25-31	7	7	1.00			
Sep	1-8	8	26	3.25	8	26	3.25
9 Sep to 16 Nov		69	33*	0.48*	69	33*	0.48*
Nov	17-23	7	4	0.57	14	4	0.29
	24-30	7	0	0.00			
Dec	1- 7	7	2	0.29	7	2	0.29
Total period of study (28 June to 7 Dec)					103	120	1.17

\* These are minimum figures since some nests may have been obliterated by wind, rain and tides during this period while the investigator was absent from the island.

Table 6. Nesting intensity of green turtles, South Reef, 1994  
(updated from Phase VI report).

Month	Period	No. of days	No. of nests	Avg. no. of nests per day	No. of days	No. of nests	Avg. no. of nests per day
June	27-30	4	2	0.5	4	2	0.5
July	1- 7	7	2	0.29	31	7	0.23
	8-15	8	2	0.25			
	16-23	8	0	0			
	24-31	8	3	0.38			
Aug	1-24	24	4	0.17	31	7	0.23
	25-31	7	3	0.42			
Sep	1- 8	8	0	0	8	0	0
9 Sep to 16 Nov		69	22	0.32	69	22	0.32
Nov	17-23	7	1	0.14	14	2	0.14
	24-30	7	1	0.14			
Dec	1- 7	7	2	0.29	7	2	0.29
Total period of study (27 June to 7 Dec)					104	42	0.41



Table 7. Yearly trends, number of hawksbill nests, South Reef.

Year	Period covered by surveys	Number of nests counted
1992	8 July - 11 Dec	116
1993	12 July - 21 Nov	128
1994	28 June - 7 Dec	120

Table 8. Yearly trends, number of green turtle nests, South Reef.

Year	Period covered by surveys	Number of nests counted
1992	8 July - 11 Dec	44
1993	12 July - 21 Nov	55
1994	27 June - 7 Dec	42

Inscriptions on tags : Two sets of corrosion-resistant metal tags were used. Those used during Phase VI A were of the 'X' series (an example of the number stamped on these tags is 019 10). These tags also carry the inscription

RETURN WILDLIFE  
BOX 155 NORTH QUAY  
4002 QLD AUSTRALIA

Metal tags used during earlier phases included those of the 'CA' series (for example, CA 705), which carry the inscription

RETURN ANPWS  
GPO BOX 636  
CANBERRA AUST 2601

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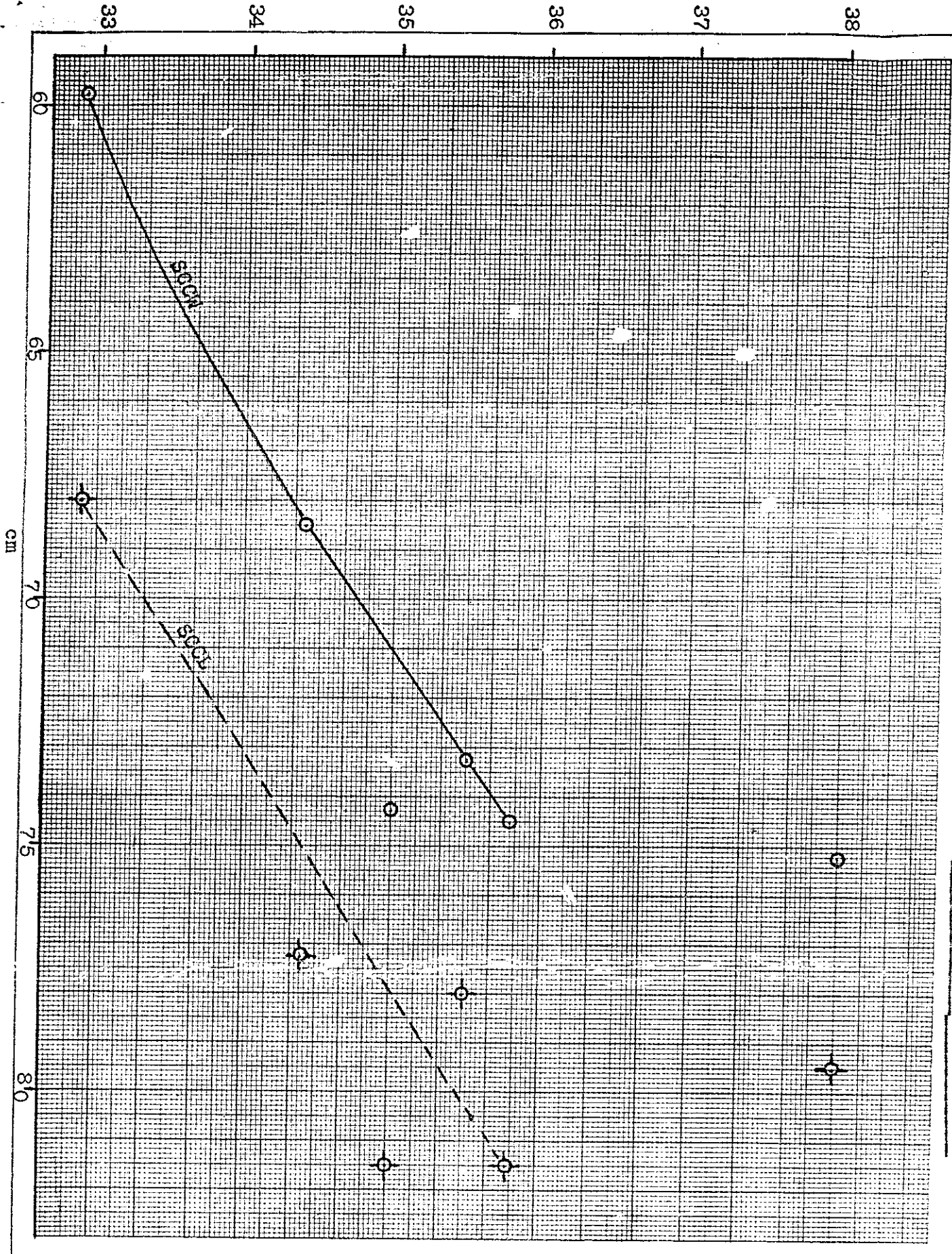
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Average major diameter of eggs (mm) →

Average egg size Vs. Carapace measurements of nesting hawksbills, South Reef



SCCL

SCCL (φ-φ)

cm

LITTLE NICOBAR, MEROE, TRAK AND TREIS ISLANDS

SEA TURTLE  
NESTING BEACHES

|||||||



MEROE I

7°30'N

TRAK I



TREIS I

93°45'E

93°30'E

PULO MILO I

MENCHALI

MARA-CHUA

PULO PANTA

AKUPA

LITTLE NICOBAR I.

PULO BAHA

DAHAYU

PULO PAHAN

PULO ULAN

7°15'N

BIVAYE

PULO KIYANG

KONDUL I

GREAT NICOBAR I