

MARINE TURTLE BY-CATCH IN SRI LANKA

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Summary:

This by-catch survey was carried out between September 1999 and November 2000 in order to assess the extent and nature of incidental marine turtle by-catch at fish landing sites within programme boundaries by collecting data on marine turtle entanglements. Information derived from this survey was then used to formulate an action plan to minimise turtle by-catch in Sri Lanka. Sixteen major fish landing sites were selected for this survey. The programme included an introductory seminar programme for fishermen at each fish landing site and the collection of by-catch data from each site. Between November 1999 and November 2000 a total of 5241 turtle by-catch was reported, this figure included all five species of turtle which nest on the beaches of Sri Lanka. A total of 13760 interviews with fishermen were carried out, which represented a sample of 39% of the total fishermen operating from the landing sites selected.

Introduction:

Sri Lanka is an island nation situated at the Southern point of the Indian Ocean. It is located between the latitudes of 5°55'N and 9°51'N, and the longitudes of 79°41'E and 81°53'E, and is shaped like a teardrop falling from the southern tip of India, separated only by the shallow seas of the Gulf of Mannar. Five species of marine turtle come ashore to nest and inhabit the waters of Sri Lanka. All five species are listed by the International Union for the Conservation of Nature (IUCN) as either vulnerable or endangered (IUCN, 1995). Despite the protection by government legislation since 1972 their future is one in jeopardy, with many turtle populations declining to the point where they are no longer significant resources either materially or culturally. This is due mainly to the indiscriminate exploitation largely at the breeding stages (Frazier, 1980; Hewavisenthi, 1990) for their eggs and meat.

Marine turtle by-catch in Sri Lanka:

Data and reports to date on the extent of turtle by-catch in Sri Lanka are confusing and provide little insight due to their contradictory nature. In 1984 Jinadasa estimated (via a series of calculations based on generalised assumptions) that marine turtle by-catch for the entire island was approximately twelve to fifteen turtles per week. Therefore, he estimated the annual marine turtle by-catch for the whole of Sri Lanka to be four hundred turtles (Jinadasa, 1984) as a realistic albeit conservative total. Hoffman also made a similar estimate in 1975.

However, it seems that these were probably gross underestimates when reports from other authors are considered. Gunawardane (1986) estimated that ten turtles were landed and butchered per day in Kandakuliya, a small fishing village on the Northwest coast of Sri Lanka. Perera (1986) witnessed the butchery of 16 turtles over a three day period in May 1986, in Negombo, a fishing town approximately 110km due south of Kandakuliya. Both authors noted that the majority of the turtles caught in the region were Olive Ridleys (*Lepidochelys olivacea*). In early 1994, TCP staff witnessed the butchery of thirteen Olive Ridleys at Kandakuliya in one morning. When interviewed local fishermen confirmed that on average at least twenty turtles were slaughtered each week. Taking into account the observations

of Gunawardana and Perera and those of the TCP staff, it is entirely feasible that the number of turtles landed and killed in Kandakuliya alone has been over 1000 per year for the last decade.

General objectives of the marine turtle by-catch survey:

Before solutions can be found to minimise marine turtle by-catch in Sri Lanka, the extent and nature of this threat must be investigated fully. The objectives of the programme were as follows;

- Assess extent and nature of incidental marine turtle by-catch at fish landing sites within programme boundaries by collecting data on marine turtle entanglements.
- Identify important marine habitats for marine turtles in Sri Lankan waters, e.g. feeding grounds, migration routes, breeding aggregation sites.

Survey sites:

16 sites were selected for the by-catch survey along the Northwest, Western, Southwest, Southern and Southeast coasts of Sri Lanka between Kalpitiya and Kirinda (448km). These fish landing sites were: Kandakuliya, Chilaw, Negombo, Colombo (Modara), Panadura (Modara), Wadduwa, Beruwela, Moragalla, Galle, Weligama, Mirissa, Dondra, Kottegoda, Tangalle, Hambantota and Kirinda.

Methods and materials:

1 Survey coordinator and 2 Survey Assistants (S.A's) were employed and trained to carry out initial introductory seminars each fish landing site. 16 monitors were employed, 1 from each of the fish landing sites who were expected in collecting marine turtle entanglement data on a daily basis. The SA's and the Survey Coordinator trained the monitor's in data collection and interview techniques within the first two months of the programme. For the following 12 months the monitors have collected turtle entanglement data from fishermen at each of the fish landing sites. The Survey Coordinator and the SA's made random visits to each site to evaluate the monitors performance and collect completed data sheets. Every 2 months the monitors, SA's and the Survey Coordinator met in Colombo to evaluate the survey progress. A data sheet was designed to collect the by-catch data.

Results:

Table 1: Numbers of each species caught per each fish landing site

Project site	No. ?	Cm	Cc	Lo	Dc	Ei	Uk	Total
1 Beruwela	699	13	28	36	36	7		120
2 Chilaw	591	1	25		1	2		29
3 Colombo	881	43	25	29	9	29	7	142
4 Dondra	481	4	8	9	6	24		51
5 Gale	1421	473	678	597	40	263	4	2055
6 Hambantota	1395	2	1		2		3	8
7 Kandakuliya	608			107				107
8 Kirinda	655	117	160	236	32	82	2	629
9 Kottegoda	1176	15	51	2	115	23	7	213
10 Mirissa	922	75	146	55	106	51	68	501
11 Morogalla	885	1		6		2		9
12 Negombo	1429	43	115	483	1	4	8	654
13 Panadura	350	5	4	1	14	3		27
14 Tangalle	1030	10	6	11	24	137	4	192
15 Wadduwa	229	2	2	4	1	7		16
16 Weligama	1008	104	61	50	44	184	45	488
Total	13760	908	1310	1626	431	818	148	5241

Key: No. ? - Number of fishermen interviewed Cm - Green (*Chelonia mydas*)
 Lo - Olive ridley (*Lepidochelys olivacea*) Cc - Loggerhead (*Caretta caretta*)
 Dc - Leatherback (*Dermodochelys coriacea*) Ei - Hawksbill (*Eretmodochelys imbricata*)
 Uk - Unknown

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According to the results, of the 5241 turtles recorded as by-catch (entangled), 1626 were Olive ridley turtles, 1310 were Loggerhead turtles, 908 were Green turtles, 431 were Leatherbacks and the remaining 148 were of unknown species (unidentified). The fate of these turtles is as follows. Of the 5241 turtles entangled, 1063 were either found dead, were killed or sold. The remaining 4178 were reported to have been released by the Fishermen.

When the fish landing sites are considered individually, 2055 turtle by-catch was recorded over the survey period for Galle. This was the highest level of by-catch of all the sites considered. For Hambantota and Moragalle, 8 and 9 turtle by-catch was recorded respectively, representing the lowest levels of by-catch. In Negombo 654 turtle by-catch was recorded and in Kirinda it was 629. The various types of Gill nets can be considered to be the key threatening nets for turtles with regard to by-catch. Although the nestings of Loggerheads and Hawksbills are occasional in Sri Lanka, survey results demonstrate that by-catch of these two species was reported in surprisingly considerable numbers.

Discussion:

The total number of 5241 turtles caught by surveyed fishermen during this period is alarming given this was only a sample of the total number of fishing boats operating at any one time. TCP estimates that the sample size of fishermen questioned is around 39% of the total present. The figure of 5241 turtles caught can be considered the minimum of actual turtle by-catch due to likely survey bias in reporting the true number for fear of negative consequences. The numbers of each species caught also produced surprises, as the predominant nesting species in Sri Lanka is undoubtedly the green turtle, while large numbers of olive ridleys are known to inhabit offshore waters. Preliminary surveys have shown that loggerhead and hawksbill turtles provide rare nesting in Sri Lanka and yet according to the by-catch survey large numbers of these turtles are caught by fishermen. Loggerhead by-catch being actually higher than that of the green and almost equal to the numbers of olive ridleys caught. While hawksbill by-catch was almost the same as green turtle by-catch. This was extremely surprising and implies that the waters surrounding Sri Lanka might provide important feeding habitats for loggerheads and hawksbills. Furthermore given that hawksbills are classified on the IUCN red list as critically endangered the numbers of these turtles caught and possibly killed is a subject of grave concern. It is also possible that the Sri Lankan fishermen are confusing the loggerhead with the green turtle due to similarities in size and characteristics.

Conclusions:

The figure of 5241 turtle by-catch was recorded as a result of interviews with 39% of the total fishermen operating between Kirinda and Kandakuliya, can be considered the minimum by-catch number for Sri Lanka (between Kirinda and Kanakuliya only). For example, if 100% of fishermen were interviewed we can assume that the true by-catch figure would be discovered to be in excess of approximately 13,000 ($5241/39 \times 100$) turtles per year. Of these turtles caught as by-catch, not all die. Out of the 5241 recorded as by-catch approximately 20% (1063) are killed, found dead or sold. Olive ridley turtles are the most frequently entangled (total 1626). The largest proportion of this species being recorded as caught in Galle (597). Galle survey site has the highest overall number of by-catch (2055). Other significant survey sites for by-catch include Negombo (654), Kirinda (629), Mirissa (501) and Weligama (488). Those survey sites which proved to be the least significant in terms of turtle by-catch were: Hambantota with only 8 recorded by-catch; Moragalle with 9; and Panadura with 27 turtles recorded as by-catch.

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