NESTING AND ADULT MORTALITY OF THE OLIVE RIDLEY SEA TURTLE ALONG MAMMALAPURAM COAST, TAMIL NADU, SOUTH INDIA

J. Subramanean

INTRODUCTION

The olive ridley (*Lepidochelys olivacea*) is the smallest and most common sea turtle in Indian waters (Kar & Bhaskar, 1982). Two ridleys tagged in Orissa were found in Kanyakumari at the tip of the Indian peninsula, and a female fitted with a transmitter in Orissa was tracked as far as Sri Lanka (Shanker *et al.*, 2003). This shows that the turtles migrate long distances along the Indian coast. Whitaker and Valliapan (1974) were the first to record nesting along the south Chennai coast, after which several institutions, carried out surveys and maintained hatcheries. Within Tamil Nadu, the Chennai-Nagapattinam coast has sporadic nesting (Abraham, 1990; Shanker, 2003; Subramanean *et al* 2004). As part of a master's dissertation, studies were conducted on nesting intensity, mortality and nesting habitat preferences.

STUDY AREA

The study area, a 50 km stretch, is located between Kalpakkam and Marakkanam, Tamil Nadu, South India. Twenty-one fishing villages occupy relatively small areas along this stretch of the coast. Nesting habitats available are sand bars and beaches backed by vegetation consisting of casuarina (*Casuarinas equistifolia*) and coconut (*Cocus nucifera*) plantations, besides residential areas. Ground glory (*Ipomoea pescaprae*) and Ravanan moustache (*Spinifex littoreus*) are the most common plants found on the beach, and *Pandanus* sp. are also found in some areas. Sand bars occur during the nesting season at the mouths of the Marakkanam backwaters and lagoons and the Buckingham Canal. A non-perennial river, the Palar, meets the sea at Aalikuppam. This study area was chosen, as there was no previous information available on nesting and mortality of sea turtles along this stretch of Tamil Nadu.

METHODS

The study area was divided into five 10 km long sectors and GPS grid points were located close to Sadras, Aalikuppam, Paramakazhani, Kadapakkam, Kaipennikuppam and Komanchavadi fishing villages. The major landmarks such as fishing villages, sand bars and vegetation patches were mapped at eighty metre intervals. Each sector was surveyed twice in a month between January and March 2004, and the entire study area was surveyed for five days on foot between 6:00-2:00 hrs.

Dead turtles were marked with enamel paint to avoid repetition in counting, data on location, injuries and morphometrics were recorded. Nesting sites were located by the presence of tracks made by the nesting female. Nesting intensity, habitat preference, location, distance from the high tide line, vegetation line, the nearest village, and status of nests were recorded. The causative factors of predated nests and predators were identified by tracks, pug marks, and the presence of egg shells, nests without animal tracks or shells were recorded as human predation.

Students Sea Turtle Network, No: 3, 4th Street, T.N.G.O.Colony; Nanganallur, Chennai-600061, Tamil Nadu. Email: j_su97@yahoo.com

RESULTS

The first nest was recorded on 6 January and the last on 13 March 2004, a total of 37 nests were recorded during this period. A peak in nesting was recorded during March with 14 nests. Two instances of false crawls were recorded, when turtles come out from the surf and returned without nesting. Five nests were recorded from Sector IV and nine in Sector II and Sector V, which shows varying densities and nesting habitat preferences. Non-human predators observed during this study included jackals (*Canis aureus*) and feral dogs. Jackals were not found near human habitation but feral dogs from villages raid nests. Of the 37 nests recorded, only 12 escaped predation, 13 were predated by jackals, eight by dogs and four by humans.

Hatching starts by mid February and continues into April. During this study hatching was not monitored as only a few nests survived and the objective of the study was to monitor beachs for nesting and mortality; however fishermen reported hatching up to late March.

Nesting turtles preferred beaches with ipomea vegetation to beaches that had no vegetation, and nests were also found on sand bars at the mouth of the Palar and Marakkanam rivers. A total of 13 nests were found close to ground glory (*Ipomoea pescaprae*) which indicates preference for nesting in such habitats. In areas with tall beach vegetation and plantations, nests were found between the high tide and the vegetation strands. Unlike on the Chennai beach, there is little beachfront lighting hence larger nesting habitat is available.

Sporadic nesting is due to ever increasing urbanization along the entire coast, the high mortality rate, is due to fisheries. Of the 136 dead turtles, 132 were olive ridley (*Lepidochelys olivacea*) and four hawksbill (*Ertmochelys imbricata*) were found washed ashore. Of these turtles some had mutilated body parts, some were gravid females and there were even instances of dead turtles eaten by jackals and feral dogs. Six dead gravid females, one in Aalikuppam, one in Komanchavadi, one in Uyali kuppam, one in Petrundurai and two in Vasan kuppam, were recorded. *Lepidochelys olivacea* mortality was found to be maximum, 110, in the months of January and February. A maximum of 23 carcasses were seen on 27 January 2004 in Sector I, between Sadras and Aalikuppam villages. Only 70 of the dead *L. olivacea* could be sexed and of these 47 were females.

DISCUSSION

The 136 dead turtles found on a 50 km stretch, clearly prove that a very large proportion of turtle entanglement occurs during the breeding season. This includes both, males and females, besides *Ertmochelys imbricate* which is extremely rare in India. Turtles are caught in ray nets, '*Thrukai valli*', a special net used for catching large rays. This is made out of cotton fibre, has buoys to keep the top of the net afloat and anchored down by weights at the bottom to keep it upright. Each unit of the net is 5 cm^2. Traditional fishermen who use these nets immediately release the turtles that get caught (*pers. com.*). The extensive loss of adults by drowning in fishing nets is of major concern and there is an immediate need to review fisheries practices and fishing zones.

The density of nesting and availability of suitable sandy beaches make the Mammalapuram coast an important area and requires higher conservation priority. Environmental education for the local community to conserve the biological diversity of

the coastal habitat should be given importance along Tamil Nadu. *In-situ* and *ex-situ* conservation of nests with the participation of the local community is important.

LITERATURE CITED

Abraham, C. 1990. Preliminary observations on the nesting of the olive ridley sea turtle (*Lepidochelys olivacea*) on the Madras coast, South India. *Hamadryad*. 5: 10-12.

Kar, C S. & S. Bhaskar. 1982. Status of sea turtles in the eastern Indian Ocean. *In*: Biology and conservation of sea turtles. Pp. 365-372. K. Bjorndal (Ed). Smithsonian Institution Press, Washington, D.C., USA.

Shanker, K., B. Pandav & H V. Andrews. 2003. Sea turtle conservation: Research and management techniques. A GOI-UNDP Project Manual. Centre for Herpetology/Madras Crocodile Bank Trust, Post Bag- 4, Mammalapuram- 603 104, Tamil Nadu, India.

Shanker, K. 2003. Thirty years of sea turtle conservation on the Madras coast. A review. Wildlife Protection Society of India. *Kachhapa*. 8: 16-19

Subramanean, J., M. Vijay & S. Bhupathy. 2004. Status of olive ridley sea turtle along the Chennai coast, southeastern India. Salim Ali Center for Ornithology and Natural History, Coimbatore, India.

Whitaker, R. & S. Valliapan. 1974. Olive ridleys on the Coromandel coast. Madras Snake Park Trust, Madras.

POST TSUNAMI OBSERVATIONS ON NESTING ACTIVITY OF OLIVE RIDLEY, (*LEPIDOCHELYS OLIVACEA*), ALONG CHENNAI COAST

J. Subramanean

The 26 December 2004 tsunami caused extensive damage to human life and property, including fishing gear of traditional fishermen. Because of this there was no fishing activity along the Chennai coast for a long time. The tsunami washed the entire length of the Tamil Nadu coast at different intensities. A 5.3 km stretch of Chennai beach between Besant Nagar and Neelankarai was monitored for nesting activity during the 2005 season.

There was no major change in nesting pattern or trends even after the tsunami the nesting season, which started in December, ended in March. Nesting frequency was highest with 45 nests, between January and February 2005. The first nest was collected on 20 January 2005 and the last nest was collected on 3 April 2005. A total of 65 nests were collected for incubation in a hatchery and the nesting intensity was 12.3 nests/km of beach stretch. The mean hatching percentage from nests in the hatchery was 59% and some nests were spoilt due to unseasonal rains.

Turtles showed greater preference to beaches with ground glory (*Ipomea pescaprę*) vegetation than to open beach or in front of villages. The major factor affecting sea turtles in this study area is beachfront lighting and predation of nests by feral dogs. The overall habitat is cosmopolitan and it is surprising why turtles come and nest in these disturbed habitats. One possible reason could be that turtles nest under stress, turtles were observed nesting under lights on the Thiruvanmiyur beach. However, it could be that the only way to conserve the olive ridley sea turtles along the Chennai coast is by hatchery management which can also be used for creating awareness.