Sea turtle conservation in India: existing laws and problems - A case study from Gulf of Mannar, Southeast coast of India

A. MURUGAN
Suganthi Devadason Marine Research Institute,
44 - Beach Road, Tuticorin - 628 001, Tamil Nadu, India
E-mail: muruganrsa@sancharnet.in

ABSTRACT
Olive ridley, green, hawksbill, leatherback and loggerhead turtles have been found to occur along the Indian coast. The Gulf of Mannar, located along the Southeast coast of India is a marine biosphere reserve and is unique for coral, seaweed and sea grass ecosystems. Gulf of Mannar is also an important place wherein all the five species of sea turtles have been reported. The survey indicated that the turtles were abundant along Gulf of Mannar coast in 1960s and 1970s. This could be evidenced from the live turtle trade existed in this coast in 1960s with Sri Lanka with an annual landing of about 3000 to 4000 turtles between Rameswaram and Mimisal. Also, turtle poisoning have been reported along this coast. After the enactment of the Indian Wildlife (Protection) Act 1972, the exploitation has got much reduced. Though all the five species are legally protected under Schedule I of the Indian Wildlife (Protection) Act 1972, the exploitation still continues along the Tuticorin coast of the Gulf of Mannar. The turtle number has got reduced along this coast in recent years due to habitat disturbance and exploitation. Green turtle is the much exploited species for the meat and the fisher folk are offered lucrative price by the turtle meat traders. Four green turtles have been recently rescued from the traders and released back into the sea. Though the present law is enough to contain the exploitation, shortage of manpower and facilities for its effective implementation are considered as the major lacuna for the continuing turtle exploitation apart from the lack of awareness among the coastal people.

KEYWORDS: sea turtle, Gulf of Mannar, Tamil Nadu, exploitation, conservation

INTRODUCTION

India is one of the twelve mega-diversity countries which together constitute about 60 to 70 % of the world's biological diversity. India has an exclusive economic zone of 2.1 million sq. km. Five species of sea turtles, olive ridley (*Lepidochelys olivacea*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) are distributed along the Indian coast. Except the loggerhead, all other species have been reported to nest along the Indian coast. Among the five sea turtles, olive ridley is the most common and abundant in India and is unique for its mass nesting along the Orissa coast (Karthik, 2000; Kar, 2001). Three olive ridley mass nesting beaches-Gahirmatha, Devi river mouth and Rushikulya-are located in the Orissa state. The olive ridleys are said to be migrating along the coasts of Tamil Nadu and Andhra Pradesh states towards the mass nesting beaches in Orissa.

The turtles migrating to Indian waters are on the decline in recent years owing to many threatening factors. The main detrimental factor is the incidental catch which is more on the east coast. Next to Gahirmatha coast in Orissa, the incidental catch is high along Tamil Nadu and the gill nets are accounted for the major killings (Rajagopalan *et al.*, 2002). They observed higher incidental catch during January to February in the year 1997 and 1998 and during that period, the mortality due to incidental catch was observed all through the year along Tamil Nadu (Rajagopalan *et al.*, 2002). Exploitation by humans, developmental activities on the beach including artificial illumination, predation by wild animals and beach erosion are the other factors affecting the sea turtles. All the five species of sea turtles are listed under Schedule I of the Indian Wildlife (Protection) Act 1972 and India is a signatory to the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Tamil Nadu state which is located along Southeast coast of India has a coast line of about 950 km. All 5 species of the sea turtles have been reported along Tamil Nadu coast and is considered the next dense nesting area for olive ridleys after Orissa. Sporadic nesting of olive ridley occurs along the northern coast of Tamil Nadu especially between Nagapattinam and Chennai coast. The coastal stretch between Tranquebar and Pazhayaru, Mamallapuram and Chennai, Point Calimere and Nagapattinam and Kanyakumari and Trichendur are the other turtle nesting areas in Tamil Nadu. In Gulf of Mannar and Palk Bay on the south, except the leatherback, the other four species were reported (Kar and Satish B.,

1982). In the Kanyakumari to Trichendur stretch, the core nesting area has been identified as between Manapad and Periathalai (Bastian Fernando, 1983). Turtle nesting has been reported during December to February and also during April to June (Murugan, 2003). The rich coral reef and sea grass areas in Gulf of Mannar form a good foraging ground for sea turtles.

The sea turtle study in India is mainly focused on olive ridleys, especially the mass nesting beaches in Orissa. But, there are other places wherein nesting of other sea turtle species has been reported and are also under threat. So, the objective of this paper is to address the sea turtle conservation issues in India through a case study in Gulf of Mannar. A survey was conducted during mid 2003 in the coastal villages and islands and the previous reports were also taken into account for comparison and assessment.

GULF OF MANNAR

The Gulf of Mannar Marine Biosphere Reserve, established in 1989, is located along Tamil Nadu State, Southeast coast of India between 8°46' and 9°14' N lat. and 78°9' and 79° 14' E long. and covers an area of about 10,500 sq. km. The biosphere consists of 21 islands categorized under four groups - Tuticorin, Vembar, Kilakarai and Mandapam groups. Tuticorin group comprises Van, Kariachalli, Kasuwar and Velanguchalli Islands; that of Vembar group Upputanni, Puzhuvunnichalli and Nallatanni Islands; the Kilakarai group Anaipar, Valliamunai, Poovarasanpatti, Appa, Talairi, Valai and Mulli Island and that of Mandapam group Musal, Manoli, Manoliputti, Poomarichan, Pullivasal, Krusadai and Shingle Islands (Fig.1).

The biosphere harbours marine biodiversity of global significance and is considered as the richest coastal regions of India with about 3600 species of fauna and flora. Two coastal districts - Ramanathapuram and Tuticorin are located along the Gulf of Mannar. One of the islands, Krusadai is considered as biologist's paradise which is unique for the endemic living fossil Balanoglosus (*Ptychodera fluva*). 11 species of sea grass belonging to 6 genera are reported to occur in Gulf of Mannar. The biosphere is characteristic for the occurrence of sea turtles and dugongs.

STATUS OF SEA TURTLES IN TUTICORIN AREA OF GULF OF MANNAR

The habit of sea turtle meat consumption exists in Tuticorin area for many decades. In 1960s, exclusive sea turtle fishing was carried out in Gulf of Mannar and Palk Bay region and live turtle trade existed with Sri Lanka. An estimated 3000 to 4000 turtles were landed annually between Rameswaram and Mimisal during that period and green turtle represented three fourth of the catch (Rajagobalan, 1984). Rameswaram, Kilakarai, Tuticorin, Tondi and Pamban were the assembling centers for the captured turtles. Special pens were erected in the sea to keep the live turtles. Special types of nets, 'Pachuvalai' and 'Kattuvalai' were used for turtle fishing. Pachuvalai' was a cast net and that of 'Kattuvalai' was a type of haul net. During 1971-76, the green turtle constituted the major share of around 89% along Gulf of Mannar and Palk Bay (Agatheesapillai and Thiyagarajan, 1979). Turtles are also got trapped in the bottom net for skates and rays,

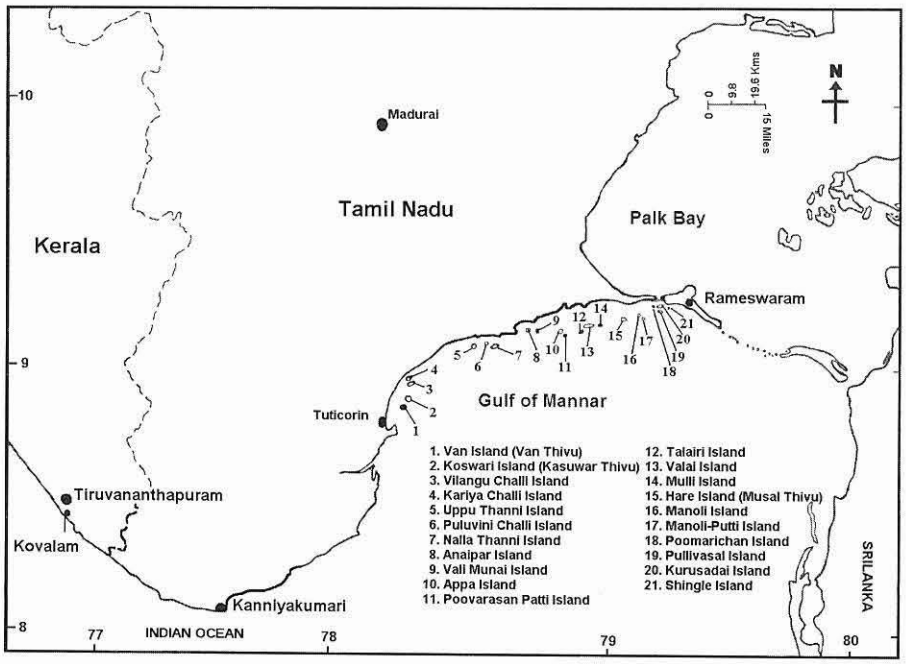

Fig.1. Map showing the Gulf of Mannar and Palk Bay.

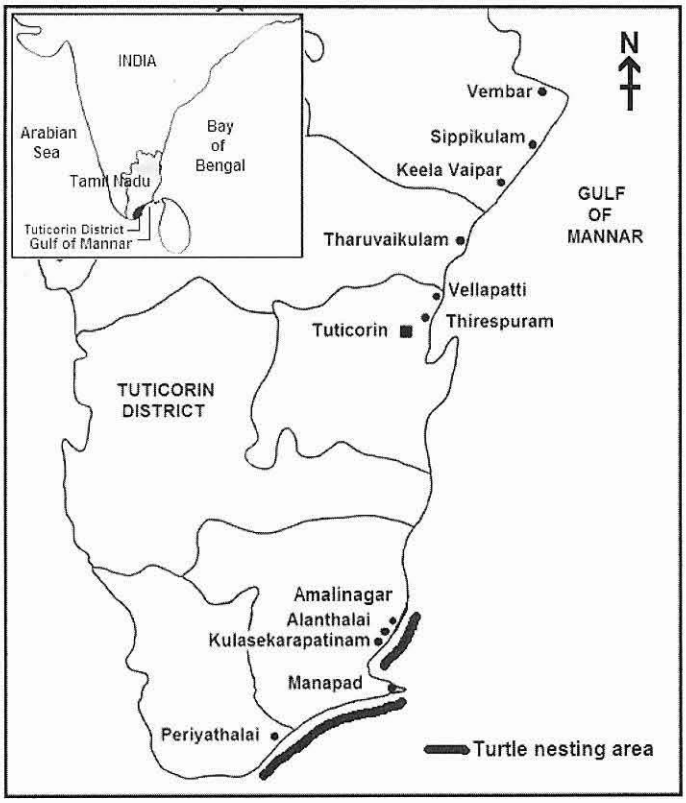

Fig.2. Map showing Tuticorin district

'Thirukkai valai' in Gulf of Mannar area. Turtle poisoning related death or injury has been reported along Tuticorin coast (Silas and Bastian Fernando, 1984). The local names for the sea turtles in this area are 'Peramai' for green turtle, 'Sithamai' for olive ridley, 'Azhungamai' for hawksbill, 'Yezhuvarai or Thoniamai' for leatherback and 'Perunthalaiamai' for loggerhead.

A survey in 1977 mentioned the turtle nesting in Puluvinichalli, Nallathani, Anaipar, Valiamunai, Appa, Valai, Mulli, Hare, Manoli, Manoli-Putti and Pullivasal Islands (CMFRI, 1977). The report indicated large scale nesting in Nallathanni Island during that period. But the recent survey in the Nallathani Island by the author indicated the lapse of prominent turtle nesting. Also, the survey among the fishermen indicated the drastic reduction or absence of turtle nesting activity in the islands.

A survey was conducted in the coastal villages of Tuticorin during mid 2003 to assess why these people like the turtle meat in spite of the reported poisoning. The common answer is that they like the taste. It is also said to cure many body ailments and is considered as an effective medicine for piles and diarrhea. An interesting factor was revealed during the survey. Some people believe that since the sea turtles travel a long distance, they possess special adaptive characters to keep their body joints in good condition. So, a soup made out of the joints of the sea turtles is believed to help them too. The turtle blood which is considered as an elixir (Rajagopalan, 1984) is consumed raw. The person who consumes the raw blood runs for a certain distance for effective digestion and absorption. Turtle eggs are also consumed as raw and in cooked state.

Turtle nesting (green, olive ridley and hawksbill) has been observed in between Manapad and Periathalai villages in Tuticorin district. Based on the interview with the fishermen, it has been noted that the turtles nests in this area during October to January and also from June to July. Abundant turtle nesting was observed a decade ago near Alanthalai, Kulasekarapattinam and Amalinagar (Fig.2). But, the continuous poaching for eggs and meat trade have reduced the nesting intensity and only sporadic nesting is observed (Bhupathy and Saravanan, 2002).

In northern Tamil Nadu coast especially in Nagapattinam coast, gill nets are widely used. In contrast to the southern coast, the people in this area have no habit of eating the turtle meat and hence, the fishermen chop off the head or flippers of the entangled turtles in order to save their nets from damage. But, egg poaching is quite high in this area like southern part. A recent study by Bhupathy and Saravanan (2003) indicated the poaching of 69 out of 72 nests by humans.

Four green turtles were rescued from the traders on 23 July 2003 by the Gulf of Mannar Marine National Park officers at Tuticorin with the help of police and were released back safely with the help of Suganthi Devadason Marine Research Institute on 24 July 2003. Before the release, the measurements were recorded for each turtle (Table 1). Obviously, after 1979, this record gives some sort of information on the green turtles distributed in Gulf of Mannar.

Table 1. Data of rescued green turtles

St. No.	Sex	CCL (cm)	CCW (cm)	Wt. (kg)
1	F	61	59	26
2	F	76	71	51.5
3	F	92.5	78	70
4	M	98	79	83.5

THE MANAGEMENT OF GULF OF MANNAR

The Gulf of Mannar Marine Biosphere Reserve is managed by a separate authority. The Gulf of Mannar Marine National Park, which is the core sector of the biosphere, is under the supervision of a Wildlife Warden. The park has four ranges, each headed by a Forest Ranger. Apart from this, the authority has seven Foresters, twelve guards and five administrative staff. The Tuticorin area is managed by a Forest Ranger, two Foresters and three Guards.

The Wildlife office has only two petrol boats at their disposal. The lower budget allocation for fuel restricts their movement. Only recently, a vehicle has been provided for the Tuticorin unit from the neighbouring forest division. But the ceiling on the fuel utilization is again a hurdle in effective monitoring process. The UNDP-GEF project under implementation is expected to provide the required facilities. Effective coordination between district administration and wildlife office is also the need of the hour. The lack of proper awareness on the endangered marine species among the various agencies like Coast Guard, Customs, Police and district administration aggravates the problem of management. After the rescue of the green turtles on 23 July 2003, additional check posts have been established along Tuticorin coast.

The infrastructure for the effective management of the Gulf of Mannar Marine Biosphere Reserve is to be strengthened under the UNDP-GEF project. Considering the vast area of the biosphere reserve, the man-power and the number of petrol boats have to be suitably increased. Though the legal protection for the management of the biosphere reserve is adequate, its effective enforcement is the need of the hour. Also, the legal proceeding against defaulters is a protracted process which has to be speeded up or a fast-track court may be established to deal with such cases. The creation of awareness among the people and involving them in conservation issues are very important for successful management of the sea turtle resources along Gulf of Mannar.

REFERENCES

Agastheesapillai, A. and Thiagarajan, R., 1979. Biology of the green turtle *Chelonia mydas* (Linnaeus) in Gulf of Mannar and Palk Bay. *J. Mar. Biol. Ass. India.* **21 (1&2)**, 45-60.

Bastian Fernando, A., 1983. Nesting site and hatching of the hawksbill turtle along Tirunelveli coast of Tamil Nadu. In: CMFRI special issue on management and conservation of sea turtles. *Mar. Fish. Infor. Serv., T & E Ser.* **50**, 33-34.

Bhupathy, S. and Karunakaran, R., 2003. Conservation of olive ridley sea turtle *Lepidochelys olivacea* (reptilian/ Chelonia) along the Nagapattinam coast, southeast coast of India. *Indian J. Mar. Sci.* **32(2)**, 168-171.

Bhupathy, S. and Saravanan, S., 2002. A report on the status of sea turtles along the Tamil Nadu coast. In: Proceedings of the National Workshop for the development of a National Sea Turtle Conservation Action Plan. GOI-UNDP Sea Turtle Project. Kartik Shanker and B. C. Choudhury (Eds.). Wildlife Institute of India, Dehradun, 70-73.

CMFRI, 1977. Report on the islands of Gulf of Mannar by CMFRI for the setting up of a Marine National Park. 33 pp.

Kar, C.S., 2001. Olive Ridley sea turtle in Orissa-review of research activities. In: Shankar, K. and B.C. Choudhury (Eds.). Proceedings of the national workshop for the development of a national sea turtle conservation action plan, Bhubaneshwar, Orissa. Wildlife Institute of India, Dehradun, India, 29-34.

Kar, C.S. and Satish B., 1982. The status of sea turtles in the Eastern Indian Ocean. In: The Biology and Conservation of Sea Turtles. Bjorndal, K. (Ed.). Smithsonian Institution Press, Washington DC, 365-372.

Karthik R., 2000. Offshore studies on Olive ridley turtles in Gahirmatha, Orissa. *Kachhapa.* **3**, 11-13.

Murugan, A., 2003. Status of Sea Turtles in India with emphasis on Andaman and Nicobar Islands. Proceedings of the Southeast Asia Sea Turtle Associative Research (SEASTAR) 2000, 63-70.

Rajagobalan, M., 1984. Value of sea turtles to India. In: proceedings of the workshop on sea turtle conservation. CMFRI special publication No.18, 49-57.

Rajagopalan, M. *et al*, 2002. Threats to sea turtles in India through incidental catch. In: Proceedings of the National Workshop for the development of a National Sea Turtle Conservation Action Plan. GOI-UNDP Sea Turtle Project. Kartik Shanker and B. C. Choudhury (Eds.). Wildlife Institute of India, Dehradun, 12-14.

Silas, E.G. and Bastian Fernando, A., 1984. Turtle poisoning. In: Sea turtle research and conservation-some problem areas. *Bull. Cent. Mar. Fish. Res. Inst.* **35**, 62-70.