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FISHERIES INDUCED MORTALITY OF OLIVE RIDLEY (*Lepidochelys olivacea*), SEA TURTLE (ESCHCHOLTZ, 1829) ALONG THE POOMPUHAR COAST, TAMILNADU

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Abstract

Sea turtles are the ancient origin turtles are world wide distribute and are migratory in nature. It was reported that population of sea turtles has declined during the past century due to direct harvest, egg collection by catch in fisheries, turtles incidental capture in fishing gear, habitat loss and pollution. The Poompuhar coast is one of the sporadic nesting locations of Olive Ridley turtles recent days coastal development activities, tourism, beach armoring, development of fishing harbors, induced to decline the population of olive ridley turtles. This paper reviews the current status of fishing activities of the peoples, fisheries induced mortality of turtles and suggest the offshore and onshore activities and habitat destruction of the coastline were identified.

Key words: Mortality, Olive ridley, Nesting beach and Poompuhar coast..

1.Introduction

India with a vast stretch of coastline and two marine eco-regions the Bay of Bengal and Arabian Sea supports the seven species known in the world. India also supports the largest known population of Olive Ridley turtles along the Orissa coast (Dash and Kar, 1990) and the largest population of Leather back turtles in the Andaman and Nicobar Islands in South Asia region (Kar and Bhaskar, 1982). Only two species of turtles are abundant in Tamilnadu. They are Olive Ridley and Green turtle. However, the marine turtles in India have to face many threats ranging from incidentally captures in marine fisheries to a host of other problems in the nesting beaches due to the various developmental activities and coastal human population depended fishing activities and their tools. It was reported that marine turtles were declining worldwide largely due to egg collection, catching turtles on land and in the sea, marine pollution and Incidental catch of fishing gears (Limpus, 1995; Renaud *et al.*, 1997). Tamilnadu coastline widespread from Chennai to Kanniyakumari. Tamilnadu coast also supports to largest population of Olive Ridleys along the Nagapattinam District (Bhupathy and Saravanan, 2001). Mortality of marine turtles was increased for every year in using various fishing gears and vessels.

The incidental death of marine turtles has been reported to occur during mechanized fishing operations. Along the east coast of India, this problem has been aggravated by the rapid expansion of the mechanized trawler industry.

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Incidental catch is highest in Orissa a due to the presence of large congregations of marine turtles with a peak in mortality during January – March (Rajagopalan *et al.,* 2001). It was estimated that fishing activities in Orissa have resulted in the death of over 90,000 Olive ridley turtles in the last decade (Pandav, 2000). Several fishery practices can cause Sea turtle mortality. Pelagic logline fisheries (Williams and Bunkley, 1996), finfish trawls, seines, gill nets, traps and lost fishing gear cause a small amount of Sea turtle mortality.

In India too, incidental capture in gill nets and trawls has become a serious threats to sea turtle population (Rajagopalan *et al.,* 2001; Pandav and Choudhury, 1999; Wright and Mohanty, 2002). Due to an increase number of fishing units, also improvement in technology incidental by catch has increased in recent years to the extent that it is the most significant cause of sea turtle mortality in India waters. Other threats to sea turtles along the Andhra Pradesh coast include poaching of eggs and of meat to a lesser extent. Developmental activities close to the beach, plantations, industries near coast, aquaculture practice and other factors also contribute to the decline in turtle population (Tripathy *et al.,* 2003). The reality for much of the world, however is that many traditional practices form regulating nature have been eroded as a consequence of expanding markets, industrialization, urbanization, state control, economic globalization and profound alterations in property fights, life styles and consumption patterns (Keller, 2000).

Despite the ample national and international legislation inadequate enforcement hampers protection measures. Loggerhead (*Caretta caretta*), Green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) turtles inhabit the Greek sea and these species are protected since 1980. The foundation of ARCHELON, in 1983, was essential in promoting sea turtle conservation. The stranding Network was initiated in 1998, but it took more than 4 years to become a reliable tool for systematic recording of turtle stranding nationwide. This paper presents sea turtles stranding data reported during the period 1992 – 2000 throughout Greece in order to draw preliminary conclusions as to the at sea related mortality. There is increasing global concern about the incidental mortality of sea turtles caught in commercial fisheries (Hall *et al.,* 2000). Some population's loggerhead turtle *Caretta caretta* are in serious decline; especially in Pacific waters there are 2 distinct genetic stocks an Australian stock and a Japanese stock (Bowen *et al.,* 1992). The decline of both stocks has been attributed to several hazards, including for predation of eggs, nesting habitat destruction and exposure to coastal and pelagic fisheries (Kamazaki *et al.,* 2003) and perhaps direct harvesting of the Japanese stock. This present study carried out on Poompuhar coast, which is the south east coast of Tamil Nadu located in Nagapattinam districts.

2. Study Methods

The present study was conducted along the Poompuhar coast between, Poompuhar – Pazhaiyar, south east coast of Bay of Bengal, Tamilnadu, from December 2010 to March 2011. In addition to the field survey secondary information was also collected from local coastal peoples, local costal villages, fisherman, trawler owners and related works, fisheries and forest department, Sea turtle conservation, peoples, Non-Government organizations. Prior to regular sampling using standard techniques, a preliminary survey was carried out along the coast between Poompuhar and Pazhaiyar for one-month period from (December, 2010). The following are field procedures used in this study.

Prior to initiating the study, preliminary surveys were conducted in the coastal areas to understand various features of the coastline such as the location of fishing gears, travelers, types of nets, size of nets, in the total coastal fishing villages. The total of 30 km of the shore line (Poompuhar – Pazhaiyar) was divided into three sectors Poompuhar – Puthukuppam, Puthukuppam - Thirumullaivasal and Thirumullaivasal – Pazhaiyar.

3. Mortality

The total mortality of the particular study period (December 2010 – March 2011) was calculated for dead on stranded Sea turtle carcasses found along use counted (Visual counting methods). Details on the number of dead turtles found on the beach, probable cause for the same and other relevant information where noted. Turtle's carcasses were marked with enamel paint to avoid the repeat count (Bhupathy and Karunakaran, 2003). The dead animals were counted and calculated for windows version 2003.

4. Results

The mortality of turtles was assessed by the coast was based on the study of onshore Carcasses of turtles it is fond along the entire study area. So, the mace the fortnightly surveys fanning the eating study period of December 2010 to March 2011. The total study area of 22 km range was mentioned in 3 sectors like Poompuhar, Thirumullaivasal and Pazhaiyar. A total of 33 carcasses (1.10/km) were observed in total of 30 km coastal region of our study. The lowest of 8 numbers and lightest of 18 were observed during the study period. The month of November were poorly recorded, December was initiate the mortality ratio. January and February is the previous recording of carcasses along the study area.

The mortality was observed in the all three regions highest mortality was recorded in Thirumullaivasal sector (10/km) and the lowest in Pazhaiyar (10/km). The pattern of mortality of turtles was mostly similar in two sectors like Poompuhar and Thirumullaivasal (No. 12). But Pazhaiyar indicate the results in low level during the study maximum (13-15) Carcasses were found along the Thirumullaivasal coast during the study period. Above the study period (December 2010 to March 2011), the maximum mortality observed or carcasses washed ashore was in the month of January, February month of number and March was recorded minimums mortality. So the earlier indication December, January of turtles carried in the shore for nesting. The relationship between turtle mortality and nesting was linear i.e., as mortality and nesting incidences were high due to the movement of mating pairs and nesting females get entangled in the gill nets used by the fishermen along the study coast. Of the total of 33 carcasses of Olive Ridleys observed during this study (December 2010 – March 2011) only (20.5%) have then were without external injuries. The remaining g (79.5%) head injuries in various part of an entire body. Flipper injuries (fully served flippers) were the most common, followed by carcasses with head injuries (27.5%) local used gill nets for fishing in the region.

There was totally more than 28,000 people depended fisheries due to their major occupation of fishing, they used three types of fishing vessels by fishing, the mechanized boat (Local mode) mechanized fiber boat and catamarans these are the traditional vessels, permitted for everyone. During this study, 1954, fishing vessels were found to form in the shore region from the total vessels out of 1949 (60%) of the vessels used for mechanized, fiber boat. Mechanized boat used for 336 (22%) and catamaran contributed almost equal like 264 (18%) this works out to be about 110 (64) village for total areas (Table - 1). The higher number of fishing vessels (126.20/km) was observed in Pazhaiyar village and the lowest (92.75/km) and the lowest in Thirumullaivasal (92.75/km).

Overall, the coastal ashore people used 10 types of fishing gill nets were used for the seasonal availability of fishes in all months of 2010 (Table - 2). Major gill net have was proposed local peoples like Mathi, Kola, Double folded, Salangai, Vaalai, Kavalai, Suruka valai, Kachaa valai, Kendal valai, Thirukai valai and Crals net I. April and May was considered to fish breeding season there was no fishing activities due to the coast mathi net was used over all in the year. Double fold net used if caught more number of fishes including juvenile for the purpose of dry fish preparation. Salangai valai also used for caught the Prawn. On this type also used in over all the suruga, kola, kacha, Vaalai, kendai, thirukai also used for a particular month for availing the selective fish caught.

Table – 1: Showed the availability of fish caughting nets during the year of –2010 along Poompuhar coast.

Gillnet type	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Matthi	+	+	+	+	+	+	+	+	+	+	+	-
Kola	-	-	-	-	+	-	-	-	-	-	-	-
Double fold	-	-	-	+	+	+	+	+	-	-	-	+
Salangai	+	+	+	+	+	+	+	+	+	-	-	+
Vaalai	+	+	-	-	-	-	-	-	-	-	+	+
Kavali	+	+	+	+	+	+	+	+	+	-	-	-
Suruku	-	-	-	-	+	+	+	+	+	-	-	-
Kacha	-	-	-	+	+	+	+	+	+	+	-	-
Semakai	-	+	+	-	-	-	+	+	-	-	+	+
Thirukai	-	-	-	-	-	-	-	+	-	-	-	-
Crab	-	-	-	-	+	+	-	-	-	+	+	-

Figure - 1: **Injuries found on the stranded carcass of the Olive ridleys along the Poompuhar coast during December 2010-March 2011**

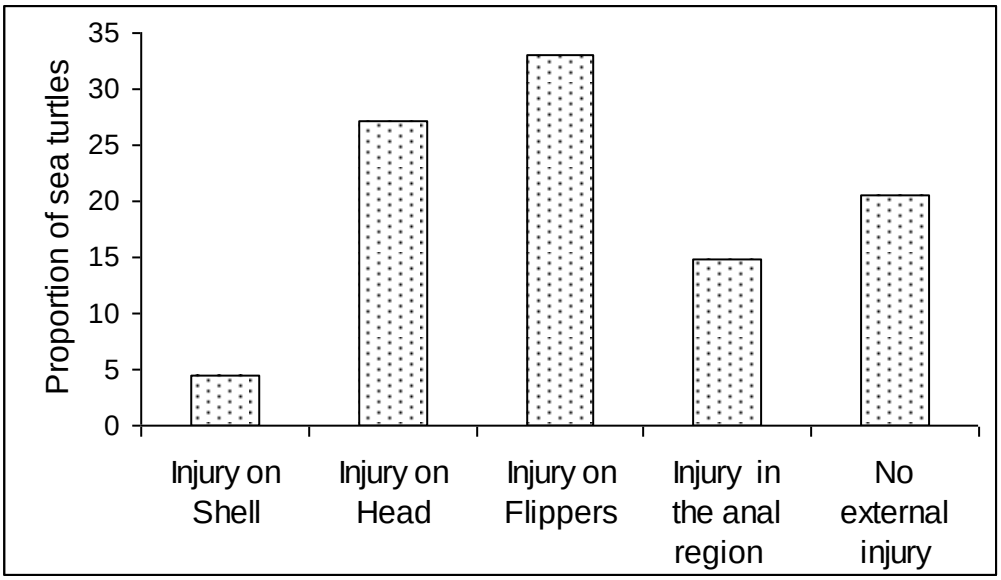


Figure - 2: Mortality of Olive ridley in different sites of coast during the study period December 2010 - March 2011

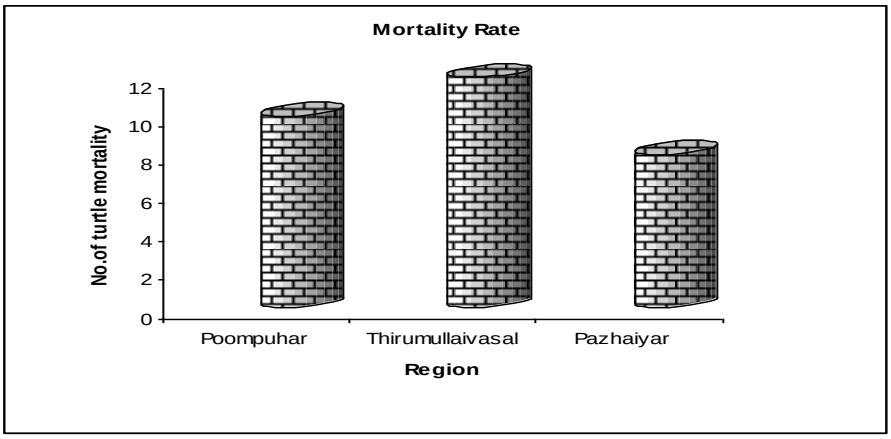
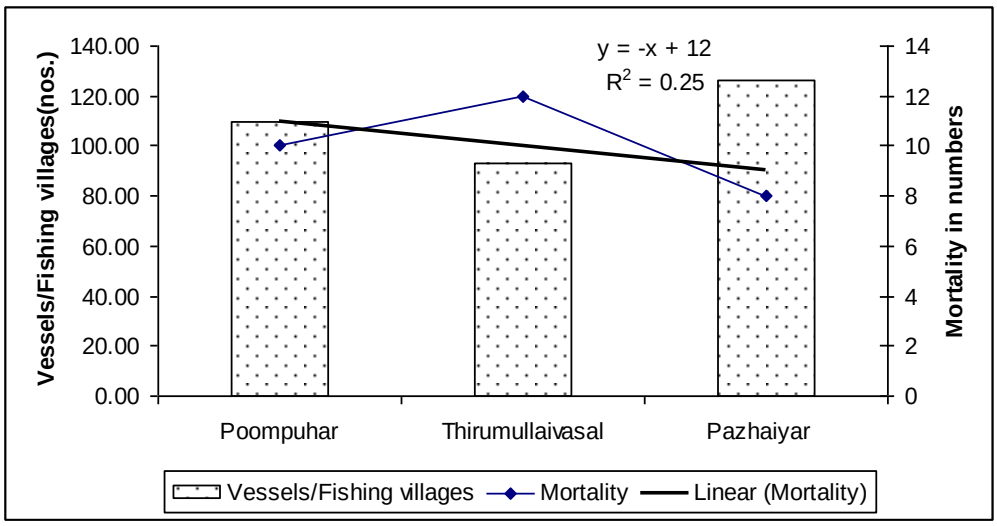


Table - 2: Statistics of fishing villages and vessels used along the Poompuhar coast

Fishing vehicles	Poompuhar	Thiurmullaivasal	Pazhaiyar	Total
Mechanised boat	70	65	201	336
Mechanised fiber boat	367	242	340	949
Catamarans	110	64	90	264
Fishing villages	5	4	5	14
Vessels/Fishing villages	109.40	92.75	126.20	110.64

Figure - 3: Relationships between the fishing vessels and stranded turtle carcasses along the Poompuhar coast during December 2010-2011



5. Discussion

The mortality of sea turtles ranges throughout the beach was increased recently. So unfortunately, the population level of Olive Ridleys is extremely decreased. A variety of threats have contributed to this decline and recent management techniques are trying to add ness these factors. In the past, sea turtle meat and eggs were frequently eaten and carapaces used for severely, but now sea turtles are protected by the Government conservation programmers and it was noticed under the IUCN trade in endangered species of wild fauna and flora (CITES) was an international treats develop is an international trait develop in 1973 that regulates trade in certain Wildlife species.

However, sea turtles still have several threats to their survival, including direct human contact natural predation, dredging and drilling of sea floors, pollutions, boat collisions, oil rig removal and fishing activities (Magnuson *et al.*, 1990). A total of 30 carcasses was observed at 33 km of the present study over on long the Poompuhar to Pazhayar coast, 134 carcasses in 50 km (2681 km) were recorded during January to March 2004 (Bhupathy *et al.,* 2007). According to Pandav and Choundry (2000), in six years (1993-1999) a total of 46, 219 dead Olive Ridleys were counted during the periodic surveys of Orissa in 282 km coastal lines. This is about 27.3 dead turtles 1 km/season. Significant relationship between mortality was due to activity related to breeding. Similar patterns were reported from the coastal part of Orissa and Andhra Pradesh (Panday, 2000; Tripathy *et al.,* 2003). In the present study, we found that no relation was found between number of fishing vessels in a sector and corresponding mortality, there i.e., the higher number of fishing vessels (126.20 km) was observed in Pazhaiyar, but the low number of dead turtles was recorded in that sector.

There are many reasons that Silas this index such a wind and water current of the Ocean. Juvenile and adult turtles have a specific gravity greater than seawaters and both adjust their buoyancy by inflating their lungs (Milsom, 1975). No of mortality was estimated that the number of dead turtles that have been washed ashore represented a maximum of 7-13% of the total mortality (Epperly *et al.,* 1996). Inter annual variation in the mortality of turtles was also recorded by Pandav and Choudhury (2000) along the Orissa coast.

6. Conclusion

The 33 carcasses of Olive ridleys observed during the study period. In present study, number of fishing of vessels in a sector was determined and corresponding mortality there (i.e.) the highest number of fishing vessels (126.201) was observed Pazhaiyar, but the lowest number of dead turtles was observed in that sector. Because, they caught fish parallel to Poompuhar and Thirumullaivasal. These results find the number of vessels increased in fishing number of mortality was increased. But, the fishing gill caught gill net may affect the incidental catch of Olive ridleys along the coast.

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