

STATUS OF OLIVE RIDLEY SEA TURTLE ALONG THE
CHENNAI COAST, SOUTHEASTERN INDIA



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REPORT

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1. Hatchling of Olive ridley
2. *Spinifex littoreus*
3. *Ipomoea pescaprae*
4. Turtle hatchery
5. Sandy beach
6. Predated Olive ridley nest and tracks

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SUMMARY

The Madras Crocodile Bank Trust (MCBT) with funding from the Convention of Migratory Species (CMS) initiated a countrywide sea turtle monitoring during 2003-04. Major activities of this project were (1) monitoring of sea turtle nesting in select beaches (2) molecular genetic analysis (3) Satellite telemetry studies and (4) networking and training of stake-holders in sea turtle monitoring and conservation. As a part of this project, Salim Ali Centre for Ornithology and Natural History (SACON) has undertaken the monitoring of turtle nesting along the Kerala and Tamilnadu coasts. In this report, we present overall scenario of Olive ridley (*Lepidochelys olivacea*) nesting along the Chennai coast. The status of Olive ridley was determined by studying the habitat available for nesting, monitoring the beach for carcasses of turtles, nests and predation. Salient findings of this study are given below.

- The Chennai- Pondicherry coast is mainly sandy with no rocky outcrops. Fishing villages are present at regular interval.
- Marine turtles arrive the coastal waters of Chennai during end of December and continue to be there till around early April.
- An estimated 11.7 nests/ km was obtained for Mamallapuram- Pondicherry beach (50 km), whereas it was 8.3 nests/ km for Beasnt Nagar - Neelankarai (6 km).
- Mortality of turtles was high along the Mamallapuram- Pondicherry coast compared to Besant Nagar-Neelankari. A total of 139 carcasses including five Green turtles (*Chelonia mydas*) and 134 Olive ridleys were observed in the former beach. Drowning of the entangled turtles in the gill nets was one of the major reasons for their mortality.
- Of the 36 nests recorded along Mamallapuram- Pondicherry, 25 (65.8%) were found poached, and the rest were found intact with clear signs of nesting.

The future of Olive ridleys along this coast will depend on the reduction of incidental catches in fishing nets, protection and restoration of nesting habitats, *in-situ* and *ex-situ* conservation programmes, reduction of pollution, a sound management plan for conservation with participation of the local community and non invasive research.

INTRODUCTION

Five species of sea turtles- the Leatherback (*Dermochelys coriacea*), Loggerhead (*Caretta caretta*), Olive ridley (*Lepidochelys olivacea*), Hawksbill (*Eretmochelys imbricata*) and Green (*Chelonia mydas*) turtles are recorded in Indian waters. The Olive ridley is the smallest of the sea turtle found in this region and is the commonest species recorded to nest along the East coast of India (Kar and Bhasker, 1979). The GOI-UNDP Sea Turtle Project survey (2000-01) along the Tamilnadu coast reported sporadic nesting of Olive ridleys (Bhupathy and Saravanan, 2002). Chennai and Nagapattinam coasts were identified as important nesting sites. Other important findings of the above project include, high mortality of turtles due to incidental catch in fishing nets, collection of turtle eggs for consumption in some sectors and determination of nesting season.

In continuation of the above project, the Madras Crocodile Bank Trust (MCBT) with funding from the Convention of Migratory Species (CMS) initiated a countrywide sea turtle monitoring during 2003-04. Major activities of this project were (1) monitoring of sea turtle nesting in select beaches (2) molecular genetic analysis (3) Satellite telemetry studies and (4) networking and training of stake-holders in sea turtle monitoring and conservation. As a part of this project, Salim Ali Centre for Ornithology and Natural History (SACON) has undertaken the monitoring of turtle nesting beaches along the Kerala and Tamilnadu coasts. In this report, we present overall scenario of Olive ridley nesting along the Coromandal coast is provided. This includes, status of Olive ridley nesting along the Besant Nagar - Neelankarai beach (6 km) based on data generated by the Student's Sea Turtle Conservation Network (SSTCN) and data collected by the project along the Mamallapuram - Pondicherry coast (50 km) during January - March 2004, the nesting season of Olive Ridleys on this coast. Information on the turtle nesting, mortality of turtles and exploitation of eggs by locals are provided. Notes on the history of turtle conservation along the Chennai coast are also given.

METHODS

Study Area

Two sectors of the Chennai coast (Mamallapuram-Pondicherry and Besant Nagar-Neelankarai, Fig. 1) were monitored during January –March 2004.

Mamallapuram- Pondicherry Coast: Mamallapuram located 40 km south of Chennai city on the East Coast Road is an important tourist spot in Tamilnadu. It is famous for its rock temple built by the Pallava kings. Pondicherry is also unique due to its Union Territory status. There are extensive stretches of sandy beaches between these two places, which provide nesting habitat for the Olive Ridley. This is an extension of the South Chennai beach. A 50 km stretch of sandy beach between Mamallapuram and Pondicherry was selected and fortnightly monitored for sea turtle nesting activity.

Besant Nagar – Neelankarai: This beach is located in close vicinity to the Chennai city. Data on the sea turtle nesting along this beach is available for the past three decades (Shanker, 2003). Solid waste disposal and light pollution appear to be major problems along this area.

Field Methods

The status of Olive ridley along the Chennai-Mamallapuram coast was determined by studying the habitat available for nesting, monitoring the beach for the carcasses of turtles, nests and predation.

Mamallapuram- Pondicherry Coast: A 50 km stretch (Satras - Komanchavadi) was surveyed. The study area was divided into five sectors using Global Positioning System (GPS). Each sector (10 km) was fortnightly sampled from January to March 2004 during morning (0600-0830 hrs) for five consecutive days. The turtles that emerge for nesting left behind drag marks (Fig. 2) were recorded. Condition of the nest was assessed based on the signs left by predators.

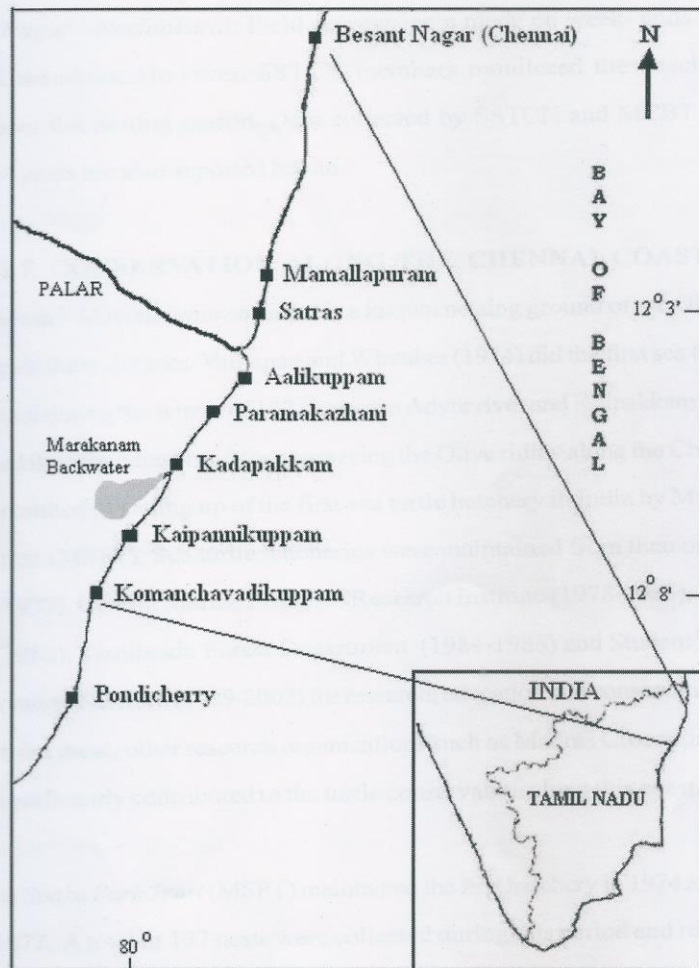


Fig. 1 Map showing the Chennai- Pondicherry coast and prominent villages

Data on the nesting habitat, predation, pollution and adult mortality and reason for death were recorded. Carcasses of the turtles (Fig. 3) were marked with paint to avoid repetition.

Besant Nagar - Neelankarai: Field surveys were made on week- ends along with SSTCN members. However, SSTCN members monitored the beach each day throughout the nesting season. Data collected by SSTCN and MCBT during the previous years are also reported herein.

TURTLE CONSERVATION ALONG THE CHENNAI COAST

The Chennai- Mammalapuram coast is a known nesting ground of the Olive Ridelys for the past three decades. Valliapan and Whitaker (1974) did the first sea turtle survey in Chennai during the winter of 1973 between Adyar river and Kalpakkam. The survey indicated the immediate need for conserving the Olive ridley along the Chennai coast, which resulted in setting up of the first sea turtle hatchery in India by Madras Snake Park Trust (MSPT). Sea turtle hatcheries were maintained from then on by MSPT (1974-1977), Central Marine Fisheries Research Institute (1978-1983), World Wide Fund (1982), Tamilnadu Forest Department (1984-1988) and Student's Sea Turtle Conservation Network (1989-2002) for research, education and conservation purposes. Apart from these, other research organizations such as Madras Crocodile Bank Trust have significantly contributed to the turtle conservation along this coast.

Madras Snake Park Trust (MSPT) maintained the first hatchery in 1974 and continued it till 1977. A total of 197 nests were collected during this period and released about 13,000 hatchlings (Table 1). Details on nesting behavior, biology and morphometrics of Olive ridley were recorded for the first time in India. Predation of nests and disturbance to nesting turtles by feral dogs, jackals and sometimes by humans were recorded.

There was little disturbance to nesting habitat, and fishermen did not consume turtle meat since it was against their custom. Only when there was reduction in fish catch, they collected eggs and that too for local consumption only. Adult turtles were released when caught in fishing gear. Large number of people have participated in the turtle walks (Valliapan and Whitaker, 1974). Further to this, a countrywide survey was organized by MSPT in 1981, and this provided the first information on many areas such as the Gujarat and Tamilnadu coasts.

Tamil Nadu Forest Department (TNFD) took up turtle operations on a large scale and launched the 'Save Sea Turtle Campaign' with hatcheries all over Tamilnadu including Madras (Shanmuganathan and Jogindranath 1984). Close to 94,000 eggs were collected, and 77,000 hatchlings released during the 1982-83 season. A hatchery by TNFD was maintained in Madras from 1982-1988 and about 200 nests were collected during this period. The hatchery operations were closed in 1988 as the Department felt that enough hatchlings were released for protection of the species.

Madras Crocodile Bank Trust (MCBT) has been active in giving guidance to organizations such as SSTCN and TREE and researchers in the region since 1988. Students of Centre for herpetology in MCBT have been monitoring nesting activity in Kovalam coast. ANET (Andaman & Nicobar Environment Team) of MCBT is actively involved in surveys and studying the turtles in Andaman Nicobar Islands. Bhasker (1979) conducted several surveys in important nesting beaches in Andaman & Nicobar Islands. During 2003-2004 breeding season of turtles, MCBT has coordinated an all India project on sea turtles.

Student's Sea Turtle Conservation Network (SSTCN) formed in 1988 has been doing conservation work by highlighting the plight of the olive ridley to the general public who come for turtle walks on week-ends. There is a decrease in turtle populations in this stretch due incidental capture of adults in gill and trawler nets, poaching of eggs,

habitat perturbation due to urbanization, beach front lighting, pollution and non human predation (SSTCN, Personal Communication). A minimum distance of 6 km between Besant Nagar to Neelankarai was monitored every night regularly for recording Olive Ridley nests during the nesting season since 1988-1989 (Abraham, 1990; Abraham et al. 1990; Mathew et al. 1991). A makeshift hatchery was maintained every year at Neelankarai for education, conservation, protection and research (Fig. 4). In certain years, when there were enough field personnel, upto 15 km was covered. Due to successful functioning of the hatchery and beach management programme, there is now a reduction in the poaching of nests. Several volunteers have been successful in pursuing their careers in the field of natural history. This activity is being continued by SSTCN on an annual basis.

Table 1. Data on the turtle eggs collected and hatchlings released by various organizations along the Chennai coast during 1974-1997; Shanker (2003).

Institution	Year	Number of eggs collected	Hatchlings released	Source
Madras snake park	1974-77	21,760	13,059	Snake park
CMFRI	1978-83	1,21,727	40,091	Silas & Rajagoplan (1984)
TNFD	1984-88	50,000	-	Moll et al (1983)
SSTCN	1989-97	82,159	>58,268	SSTCN Report

Salim Ali Centre for Ornithology and Natural History (SACON), as a part of the all India coordinated WII-GOI-UNDP project (2000-01) on sea turtles, conducted surveys along the Tamilnadu. The results reported sporadic nesting all along the coast of this state and drastic decline in the turtle nesting in some places. Chennai- Pondicherry and Nagapattinam coasts were identified as important nesting beaches in the state (Bhupathy and Saravanan, 2002). As a part of CMS-MCBT project, SACON is monitoring the important turtle nesting beaches of Kerala and Tamilnadu during 2003-04.



Fig. 2 Turtle tracks- indication of turtle nesting

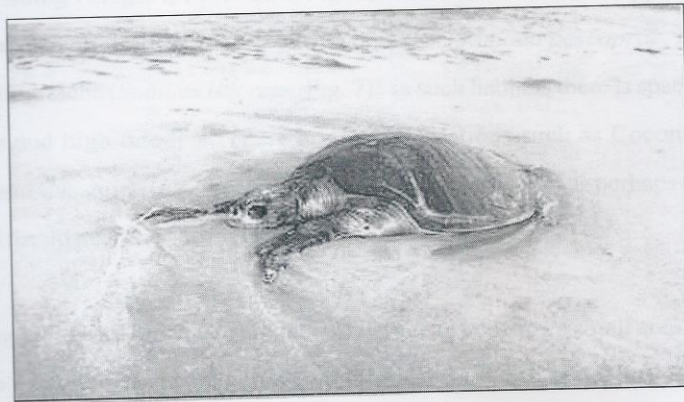


Fig. 3 Carcass of Olive ridley turtle, a common scene along the Chennai coast during January-March



Fig. 4 *Ex-situ* conservation (Hatchery), SSTCN- Chennai

Trust for Environment Education (TREE) is a registered charitable trust involved in Environment education. TREE has undertaken Olive ridley conservation activities through the participation of local community in Neelankarai and Paniyur villages. TREE attempts *in-situ* conservation practice by protecting and monitoring nesting sites. The first project was initiated during 2003-04 Olive ridley nesting season (Dharani, 2003).

NESTING HABITAT

Mamallapuram- Pondicherry coast: The beach is mainly sandy with no rocky outcrops (Fig. 5). Fishing villages are present at regular distances. The habitat type consists of sandy beaches with trailers such as Ground glory (*Ipomoea pescaprae*, Fig.6) and Ravanan moustache (*Spinifex littoreus*, Fig. 7). In such habitats there is space between vegetation and high tide line. There are also plantations such as Coconut (*Cocos nucifera*) and Casuarina (*Casuarina equisetifolia*). *Pandanus* sp. is perhaps the largest wild plant found near the shore (Fig. 8).

The fishing villages are located at regular intervals, but occupy a small area compared to the whole habitat. There are very few lights near the beach as the East Coast Road is considerably away. The possible form of pollution in this beach is from hatcheries that produce marine products such as squids and prawn. Sometimes oil that is used for cleaning trawlers is washed on the shore. Garbage dumps are largely absent along this beach. All these factors make this coast an important nesting beach.

Besant Nagar- Neelankarai: There has been an increase in beachfront lighting in this stretch leading to loss of natural habitats compared to previous years. This has been increasing every year. The turtles due to stress some times nest under lights and get disoriented. The chances of hatchlings reaching the sea under such conditions are low. Excessive growth of weeds, pollution from prawn hatcheries and dumping of garbage has degraded 90% of the beach. The loss of habitat in



Fig. 5
Sand bar in Aalikkuppam beach



Fig. 6
Ground glory, *Ipomoea pescaprae*
is common in the study area



Fig. 7
Ravanan moustache, *Spinifex littorei*
is a common grass found in the area



Fig. 8
Pandanus sp is one of the
largest shore vegetations found
along this coast

this stretch is maximum in the whole of South Chennai. Pollution is mainly from prawn hatcheries, which should be following pollution control norms. Three prawn hatcheries discharge waste directly into the sea, and are present at Palavakkam and Chinna Neelankarai villages. Parts of the beach are used for dumping garbage, especially plastic materials.

NESTING

Marine turtles arrive the coastal waters of Chennai at the end of December and continue to be there till around early April. Some turtles nest in cosmopolitan areas, while others nest in areas without any human disturbance. The turtles emerge for nesting between 0000 and 0400 hrs along this coast, although a freak nesting at 1600 hrs was reported by the staff of Madras Crocodile Bank Trust near Mamallapuram.

Mamallapuram- Pondicherry coast: A total of 36 nests were recorded during fortnightly sampling from January to March 2004. The distribution of nests was similar in all (5) sectors (average = 7.2/ 10 km, range = 5 - 9 nests) studied. The nesting turtles had strong preferences for certain patches of beaches and nesting was observed in clusters of two or three. Distance between these clusters was less than 1 km. Beaches that had vegetation such as *Ipomoea pescaprae*, little disturbance from lights and sand bar near rivers were preferred nesting habitats. Within sectors, certain patches had higher nesting than others. This could be due to the homing instinct of turtles. It is to be found that if the turtles use the same patches every year for nesting. Nesting density was high between the second fortnight of January and the first half of March (Fig. 9). Fishermen reported seeing hatchlings during the second half of March. When fortnightly sample data was extrapolated to the whole nesting season, an estimated 11.7 nests/km (585 nests for 50 km) was obtained.

Besant Nagar- Neelankarai: The SSTCN volunteers regularly monitored a 6 km stretch of beach between Besant Nagar and Neelankarai during the nesting season of turtles. During 2003-04, a total of fifty nests were located. The first nest was collected

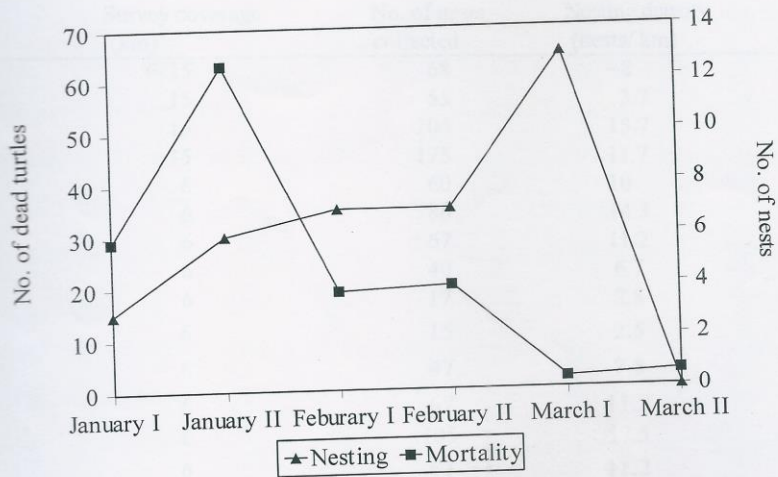


Fig. 9 Fortnightly nesting and mortality of sea turtles along the Mamallapuram-Pondicherry coast during January- March 2004

in Besant Nagar beach on 8th January 2004. Nesting turtles were spotted on several occasions during the night walks. In general the nesting habitat appears degraded, turtles come and nest in this area. The nesting density for this sector during this study period was 8.3/ km, and is consistent with results of recent surveys in Tamilnadu (Bhupathy and Saravanan, 2002). An analysis of 30 years of data shows an average of 9.5 nests /km along this coast (Shanker, 2003). An *in-situ* conservation programme has been initiated recently in the stretch south of Neelankarai with the help of local youth (Dharani, 2003). The SSTCN volunteers also recorded some nests that hatched in the wild. The hatchlings from one such nest were found to be badly disoriented and were struck in vegetation. These hatchlings were collected and released. Data on the nests collected and hatchlings released are given in Table 2.

Table 2. Sea turtle nest records and hatchlings released by SSTCN along the Chennai coast; (Shanker, 2003).

Year	Survey coverage (km)	No. of nests collected	Nesting density (nests/ km)
1989	6-15	68	~8
1990	15	55	3.7
1991	15	206	13.7
1992	15	175	11.7
1993	6	60	10
1994	6	86	14.3
1995	6	67	11.2
1996	6	40	6.7
1997	6	17	2.8
1998	6	15	2.5
1999	6	47	7.8
2000	6	67	11.2
2001	6	105	17.5
2002	6	67	11.2

MORTALITY

Mamallapuram- Pondicherry coast: A total of 139 carcasses in different stages of decomposition were observed during the present study. This includes five carcasses of Green turtle (*Chelonia mydas*) and 134 carcasses of Olive ridleys. Drowning of the entangled turtles in the gill nets was one of the major reasons for their mortality. Locals buried some turtle carcasses due to the stench that came from them. Some of these turtles were gravid females. There were concentrations of dead turtles in some sectors with distance less than 100m. Turtles which drown in fishing nets, and thrown out by fishermen were washed ashore. Jackals and feral dogs consumed the fleshy parts. Gill nets or 'Thirukai valai' meant for catching Rays sometimes trap Olive ridleys in it.

Besant Nagar- Neelankarai: The mortality of turtles in this sector was not as high as in Mamallapuram-Pondicherry coast. Six dead turtles were recorded in Besant Nagar- Neelankarai area. In addition, a Green turtle was recorded on this beach. These mortalities were due to drowning in fishing gear.

PREDATION

Mamallapuram- Pondicherry coast: Of the 36 nests, 25 (69.4 %) were found poached (by both human and natural predators) and the rest were found intact with clear signs of nesting. The non-human nest predators observed during this study include jackals and feral dogs. Jackals were responsible for 54.2% of nest predation(Fig.10). Professional poachers walk at night to collect the eggs. Jackals were not found near human habitation, but feral dogs near villages raid the eggs. Enquires revealed that Sri Lankan Tamils sometimes come to buy turtles from the fishermen.

Besant Nagar- Neelankarai: Feral dogs were the main predators of nests in the Besant Nagar beach that was missed by the SSTCN volunteers. Human predation was restricted to some areas only as most of the stretches were monitored. Presence of predatory fishes near hatchery release points is a human induced predation. There is still some opportunistic poaching of eggs for local consumption.

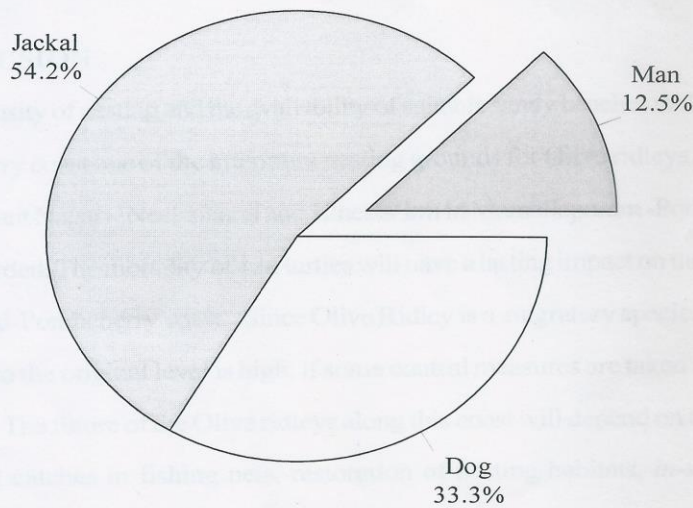


Fig. 10 Predation of sea turtle nests along the Mamallapuram - Pondicherry coast

EXPLOITATION

Mamallapuram- Pondicherry coast: The major form of exploitation along this coast was poaching of eggs by local (rural) communities. This can be linked to the poverty in the region which makes turtle eggs a source of protein. Local communities such as Irula tribals utilize this natural resource in some areas. There are also one or two regular poachers in each fishing village, and most of the nests are vulnerable to predation by human.

Besant Nagar- Neelankarai: The fishermen in Besant Nagar stretch no longer use old methods of fishing by 'catamarans', but use mechanized boats driven by motor for long distance travelling. Mechanized trawlers drown turtles that get caught in them. Sitting in Besant Nagar beach at night one can see several trawler lights in the distance. These trawlers mainly catch prawn, which is exported to the Southeast Asian countries. Rays are caught in special gill nets (*Thiruku valai*) made for the purpose. Turtles that get caught in these nets are mostly released, if they are found alive. Turtles also damage fishing gear and sometimes take fish caught in these nets. Fishermen in the area report that they encounter a large number of turtles during a certain season.

CONCLUSION

Higher density of nesting and the availability of suitable sandy beaches make the Chennai-Pondicherry coast one of the important nesting grounds for Olive ridleys. About 8 nests/km in Besant Nagar-Neelankarai and 12 nests/km in Mamallapuram-Pondicherry beach were recorded. The mortality of 134 turtles will have a lasting impact on the Olive Ridleys of Chennai-Pondicherry coast. Since Olive Ridley is a migratory species chances of its recovery to the original level is high, if some control measures are taken to prevent such mortality. The future of the Olive ridleys along this coast will depend on the reduction of incidental catches in fishing nets, restoration of nesting habitats, *in-situ* and *ex-situ* conservation programmes, reduction of pollution, a sound management plan with the participation of the local community and non invasive research.

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Appendix : 1 Fishing villages and boats available in the study area (along the Mamallapuram-Pondicherry coast).

S. NO	VILLAGES	FISHING BOATS	
		CATAMARAN	DIESEL/PETROLBOATS
1	Satras	80	10
2	Pudupattinam	10	80
3	Uyalikuppam	50	18
4	Chinna kuppam	30	20
5	Peria kuppam	100	40
6	Aali kuppam	50	17
7	Angalaamman kuppam	20	5
8	Pazhayanadu kuppam	4	15
9	Pudunadukuppam	25	1
10	Perunthuravu	20	10
11	Paramanghani	60	35
12	Thadathazhni kuppam	20	44
13	Paniyurchinna kuppam	10	20
14	Paniyur Peria kuppam	10	40
15	Kadappakam kuppam	20	6
16	Alambari kuppam	50	40
17	Azhakar kuppam	10	35
18	Vasarkuppam	20	45
19	Yekkairkuppam	50	90
20	Pudukuppam	50	16
21	KomAnchavadi kuppam	20	27
Total		709	614