

# Rushikulya Sea Turtle Rookery - A Status Report

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Olive ridley sea turtles (*Lepidochelys olivacea*) are well known for their huge nesting aggregations. During the breeding season, thousands of olive ridleys congregate in favourable coastal waters and synchronised nesting involving thousands of individuals take place in suitable nesting beaches. At present there are very few sites left in the world where olive ridleys congregate in such large numbers for nesting. Of the six known major mass nesting sites of olive ridleys, three are located in India and all these three mass nesting beaches are located along Orissa coast. The world's largest known rookeries of olive ridleys are at Gahirmatha along the northern Orissa coast (Bustard, 1976; Dash and Kar, 1990), the rookery near the mouth of river Devi which is located 100 km south of Gahirmatha (Kar, 1982) and the rookery near mouth of river Rushikulya, located 320 km south of Gahirmatha (Pandav et al., 1994a). Although nesting of olive ridley has been reported from the sea beach near mouth of river Rushikulya (Panigrahy et al., 1990), the mass nesting of ridleys at this rookery came to the knowledge of the conservation community as recently as 1994. A survey of sea turtle nesting habitats along Orissa coast carried out by the Wildlife Institute of India in collaboration with the Orissa Forest Department (wildlife wing) led to the discovery of the Rushikulya rookery in March 1994 (Pandav et al., 1994b). After its discovery, the Wildlife Institute of India initiated a tagging and monitoring program at this rookery in 1995.

## **Location of the nesting beach**

The rookery is located on the mouth of river Rushikulya and is only one km east of the Madras-Calcutta National Highway No. 5 and the South Eastern Railway line near Ganjam town

along the southern Orissa coast. The nesting beach at Rushikulya spreads over six km., from the village Purunabandha (one km north of Rushikulya River mouth) to Kantiagada village. The entire stretch between Purunabandha and Kantiagada witnesses heavy sea turtle nesting during January to May every year. The nesting beach along this stretch is more or less flat with scattered sand dunes of 1-2 m high. The average beach width is 80 m above the high tide line, though at some places the extent of beach is more than 100 m. Natural beach vegetation include *Ipomea pescaprae* and *Spinifex littoreus*. The nesting beach along this stretch lacks the extensive Casuarina plantation which is otherwise a common feature along most part of Orissa coast. The backwater of river Rushikulya extends 2km northwards along the nesting beach. The Palur canal which connects the Chilka Lake with Bay of Bengal through the estuary near Rushikulya river mouth runs parallel to the nesting beach for 8 km. There are two permanent fishermen settlements on the nesting beach - Gokharkuda and Kantiagada.

## **Intensity of nesting at Rushikulya rookery**

Sporadic nesting of sea turtles at Rushikulya begins by January and continues till end of April every year. The turtles at Rushikulya exhibit a distinct temporal pattern of nesting with most of the nesting taking place during neap tidal nights. Maximum nesting concentration at this rookery is observed on a four km stretch between Kantiagada and Gokharkuda villages and on a one km stretch from Gokharkuda village to the mouth of river Rushikulya. Mass nesting of olive ridleys at this rookery was documented for the first time in March 1994. Although the guestimate during March 1994 projected a nesting figure to be around 200,000 (Pandav et al.

1994), the actual number of nesting females could have been much less than this projected figure. Mass nesting of olive ridleys have been documented since 1995 and a detailed account of nesting figure is given in Table 1.

**Table 1. Details of olive ridley mass nesting at Rushikulya rookery from 1995 to 1998.**

Year	Date of mass nesting	Estimated number
1995	20 - 21 March	50,000
1996	21 - 25 February	55,000
1997	01 - 03 February	35,000
1998	21 - 24 March	25,000

Unlike previous years (1994 - 1998), no mass nesting was observed at Rushikulya rookery in 1999. Nearly 2, 000 turtles were documented to have nested at this rookery during March and April 1999.

### **Incubation success at Rushikulya**

Incubation success for the sea turtle eggs laid at this rookery was calculated for four nesting seasons (1995 to 1998). Normally a week after the hatching of sea turtle eggs, the nests were excavated at this rookery every year and the nest contents were examined to calculate incubation success at Rushikulya. Compared to the other rookeries in Orissa (Gahirmatha and Devi), Rushikulya showed an extremely high incubation success. A total of 77,208 eggs were counted to determine the incubation success. The average (Mean  $\pm$  Standard Deviation) clutch size at Rushikulya was  $127.9 \pm 19.2$  (range = 66 to 199, n = 600). The overall hatching success of turtle eggs at Rushikulya during 1995 to 1998 was  $95.01 \pm 7.03$  (range = 39.7 to 100, n = 600 nests). Compared to the Gahirmatha rookery the emergence success of the turtle hatchlings at Rushikulya was also considerably higher. The overall emergence success during 1995 to 1998 was  $92 \pm 10.9$  (range = 18.2 to 100, n = 600 nests).

In comparison to Gahirmatha (Dash and Kar, 1990; Pandav, 2000), the incubation success at Rushikulya is extremely high. The beach at Rushikulya is wide, turtle nests are spread out and moreover its three-tier structure (low, medium and high beach) is free of tidal inundation. The ideal condition of egg development at Rushikulya is reflected in terms of low embryonic mortality. Only 1.7% embryonic mortality was recorded from the 77,208 eggs counted during the study. Although Rushikulya receives smaller number of nesting turtles in comparison to Gahirmatha, its potential in terms of a stable and more productive beach can not be overstated.

### **Tagging study at Rushikulya**

Tagging of olive ridleys was initiated at Rushikulya in 1997. Over three breeding seasons (1997 to 1999) 3,084 nesting olive ridleys have been double tagged at this rookery with monel metal tags. Turtles recaptured at this rookery during subsequent nesting seasons showed a higher degree of nesting site fixity during the present study. Forty four of the 519 turtles tagged during February 1997 arribada at Rushikulya rookery were recaptured in the March 1998 arribada at the same rookery. Ridleys generally re-laid their nests within 100 to 300 m of their previous nests with a range of 0 to 1,000 m. However, turtles tagged at Rushikulya were recorded to shift their nesting beaches during the same breeding season. Two of the turtles tagged during the arribada at Rushikulya rookery on 2 and 3 February 1997 (Tag No. WR25417, WR25418 and WR25793, WR25794) were recaptured while nesting in another arribada at Robert Island near Devi River mouth on 17 March 1997. Similarly one of the turtles tagged near Chilka mouth (WG20020 and WG20021) on 30 March 1997 shifted its nesting beach and was recaptured while nesting at Rushikulya rookery during the arribada on 23 March 1998.

Besides these movement of nesting turtles between Rushikulya and other nesting beaches, several of the turtles tagged at Rushikulya were found washed ashore the Devi, Paradeep and Gahirmatha coast. Till January 2000, 13 of the

3084 nesting females tagged at Rushikulya rookery were found dead in Orissa. Of the 13 tagged turtles, one was found washed ashore near Satbhaya village along the Gahirmatha coast and the remaining 12 were found in the coastal stretch between Paradeep and Devi River mouth. The distance between the place of tagging and the place of recovery of dead turtles varied from 200 to 320 km. Recovery of dead turtles away from their place of tagging strengthens the view that there exists certain degree of movement of sea turtles in the coastal waters off the mass nesting beaches in Orissa. The same turtles that are using the Rushikulya rookery for nesting are also frequenting the coastal waters off Devi River mouth, Paradeep and Gahirmatha. This is again substantiated by the fact that ridleys in Orissa are using more than one beach for nesting (Pandav, 2000). Although mortality of sea turtles near Rushikulya is minimal, turtles tagged at the same rookery have been recovered dead near Devi River mouth, Paradeep and Gahirmatha. The coastal waters in these areas are subjected to heavy commercial fishing activities and densities of dead turtles washed ashore in these areas are extremely high. Therefore providing adequate protection to sea turtles in the coastal waters off Gahirmatha and Devi is not only crucial for the turtles nesting in these areas but also for the turtles using the Rushikulya rookery.

So far, nine of the turtles tagged at Rushikulya have been recaptured away from Orissa. Of the nine recaptures, one is from Kanyakumari, one is from Gulf of Mannar and the remaining seven are from Sri Lanka. These recaptures show that the ridleys nesting at Rushikulya show a distinct migration pattern and are most probably using the coastal waters of Sri Lanka as well as the Gulf of Mannar as foraging areas.

### **Conservation significance of Rushikulya rookery**

Gahirmatha undoubtedly supports huge nesting congregation of olive ridleys in Orissa. However, the importance of smaller rookeries like Rushikulya can not be ignored. As the incubation success data of this study indicates, eggs laid at

Rushikulya have a significantly higher incubation success compared to that of Gahirmatha. Keeping in view the rapid fragmentation of nesting habitat at Gahirmatha and the resulting lower incubation success, Rushikulya emerges as an important rookery that can help in sustaining a stable population of ridleys in the long run.

As the result of this tagging study indicates, turtles using Rushikulya rookery for nesting are also frequenting the coastal waters off Devi and Gahirmatha. Therefore the possibility that the turtles nesting at Devi and Gahirmatha are also using Rushikulya can not be ruled out. The tag recoveries indicate that turtles nesting at Rushikulya are not a distinct population. Rather, they are part of a larger population that is visiting Orissa coast every winter. Any harm to the nesting beach or to the nesting turtles at Rushikulya can have adverse impact on the turtles visiting the Orissa coast that could well be a single population.

### **References**

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