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BEACH PROFILE CHARACTERISTICS OF THE OLIVE RIDLEY MASS NESTING BEACH AT RUSHIKULYA, INDIA

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The dynamic ecosystem of sandy beaches is shaped by processes such as erosion, accretion, and sediment deposition. In many coastal regions around the world, these beaches also serve as nesting habitats for sea turtles and have a significant influence on their reproductive success and hatchling recruitment (Wood & Bjorndal, 2000). Beach characteristics such as slope, width and vegetation cover are known to influence sea turtle nest site selection (Jankie & Lawrence, 2013; Bladow, 2017). Olive ridley sea turtles nest *en masse*, in a phenomenon called an *arribada*, at a few known sites on the east coast of India and Mexico and Central America. These mass nesting beaches are often located near river-mouths and are highly dynamic in nature. To understand the characteristics of these nesting habitats, this study examined the variation in beach characteristics at the Rushikulya mass nesting beach in Odisha. Spatial and

temporal variation in beach profiling data (Figure 1, 2), collected between 2012-2022, across different sections of the mass nesting beach were determined and the



Figure 1. People conducting beach profile surveys. (Photo credit: Chandana Pusapati)

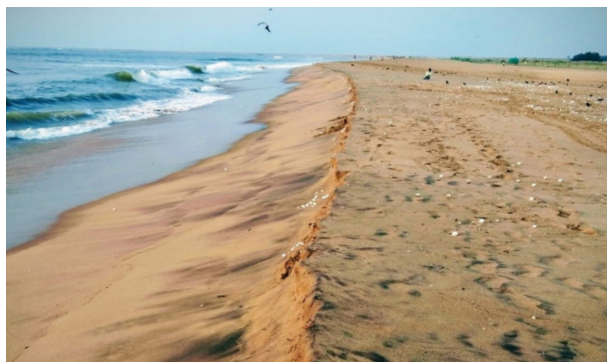


Figure 2. Beach erosion and exposed eggs. (Photo credit: Bippro Behra)

influence of distance from the river-mouth on these beach parameters and their relationship with solitary and mass nesting intensity was examined.

Results showed that beach slope and beach width varied significantly between nesting seasons across all sections of the nesting beach. The beach width decreased with increasing distance from the river mouth, while beach slope showed marginal variation. Beach width influenced the nesting intensity across various sections of the beach. However, nesting intensity did not vary significantly with distance from the river-mouth. These findings indicated that changes in the habitat characteristics could significantly influence the number of turtles able to nest successfully and/or the hatching success (proportion

of eggs that produce a hatchling) in a nesting season. The olive ridley turtle's preference for nesting beaches near river mouths might indeed confer an advantage given that the beaches are wider near the river-mouth. This study underscored the importance of long-term monitoring of spatial and temporal dynamics in nesting beach characteristics. With increasing frequency of unseasonal rain as well as coastal developmental projects, beach characteristics might change significantly. Future studies should, therefore, prioritise investigating the evolving dynamics of the nesting beaches, facilitating the development of strategies to mitigate adverse impacts and ensuring effective habitat management.

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IMPLICATIONS OF LOW HATCHLING PRODUCTION FROM HATCHERIES FOR SEA TURTLE POPULATIONS IN INDIA

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India's coastal waters are home to five species of sea turtles, of which the olive ridley (*Lepidochelys olivacea*) *arribada* nesting population is of global significance. The species encounters numerous natural and anthropogenic threats during its life history, due to which it is accorded legal protection in India and is the focus of conservation efforts. The most public turtle conservation strategies in India are hatcheries that protect the egg/hatchling life stage. Hatcheries are protected enclosures on or close to the nesting beach, where threatened eggs are incubated to improve hatchling production. The majority of sea turtle eggs

laid on nesting beaches in Gujarat, Maharashtra, Goa, Karnataka, and Tamil Nadu are relocated to hatcheries (Phillott & Kale, 2018). Their frequency of use is likely due to the ease of accessibility of this life stage compared to others, comparative cost, and potential for education and outreach benefits as well as conservation. Conceivably, hatcheries can have a significant impact on hatchling production and future sea turtle population dynamics in these states (Phillott *et al.*, 2021).

However, not all hatcheries adhere to best practices, so hatching success may be comparable to or lesser than