

MARINE TURTLES OF THE INDIAN SUBCONTINENT. Edited by Kartik Shanker and B C Choudhury. Orient Longman Private Limited and Universities Press (India) Private Limited, Wildlife Institute of India (WII) and United Nations Development Programme (UNDP). March 2006, 415 pp.

Tracking turtles

A collection of essays and articles looks at marine turtles in the Indian subcontinent and the conservation efforts required to save them

The Indian subcontinent provides nesting grounds for five of the world's seven species of marine turtles—olive ridley, green, hawksbill, leatherback and loggerhead. They form the focus of the publication under review. A collection of surveys, reviews and essays, it provides information on turtle biology, habitat, population status, fishery-related mortality, the various threats faced by these marine turtles and the conservation efforts required to save them.

Essentially, the book documents the various research activities undertaken, between 2000 and 2002, by the joint Government of India-UNDP Sea Turtle Project. They include surveys on the status of the marine turtle population along the islands and the east and west coast of India, Sri Lanka, Pakistan and Bangladesh as well as a review of various community-based conservation efforts.

The book contains 30 chapters divided into eight parts. The first chapter provides an interesting and comprehensive overview, tracking the research and conservation efforts from historical records and scientific reports from the 1970s to current initiatives. The chapter concludes by highlighting the need for responsible marine fisheries not merely for the sake of marine turtle conservation but also for the economic concerns of stakeholders, particularly local communities. The editors hope that the coming decade in marine turtle conservation will be one of partnership

and collaboration among diverse stakeholders.

In *Turtle Trekker*, herpetologist and naturalist Rom Whitaker describes the tremendous pioneering efforts of Satish Bhaskar in surveying turtles along the Indian coast. Bhaskar's survey results and publications (also listed in the chapter) form the baseline for turtle biologists in India. This chapter provides an interesting recollection of 'turtle walks', and traces the different moments and individuals in the history of marine turtle conservation in India.

The second and third parts of the book contain ten chapters of detailed biological and ecological information on marine turtles—their nesting grounds, nesting intensity, distribution and season, size class and reproductive efforts, for each of the species found in the waters along the east and west coasts of India, including the Andaman and Nicobar Islands and the Lakshadweep Islands. The methodology adopted in assessing the status of marine turtles has been analyzed and the information has been presented in well-defined tables, charts and maps. The chapter on Orissa, for instance, provides descriptive information for all three popular nesting grounds of olive ridley turtles, along with maps of the region.

Habitat loss

These chapters also provide information on the number of fishing vessels and fishermen in the coastal States. They also identify the threats faced by marine turtles in these States, which could have caused their decline in numbers. These range from degradation of habitat and predation of eggs and hatchlings, to

tourism and coastal development, coastal pollution, aquaculture, casuarina plantations on the nesting beaches, beach erosion, consumption of meat and eggs to fishery-related mortality.

Most of the authors in this publication identify the major threat to the marine turtle population as fishery-related mortality and depredation of eggs. These chapters also provide information on the various conservation initiatives undertaken by the respective State governments, non-governmental organizations (NGOs), stakeholders and research institutes, and suggests a set of recommendations to be implemented.

Particularly noteworthy is the chapter on the marine turtles of Sri Lanka, which provides a historical account of the trade in tortoise shell and turtle meat in the region, which dates to 64 BCE and was prevalent until recently.

The fifth part of the book draws attention to fishery-related issues. The chapter on fishery-related turtle mortality highlights the various changes in the Indian fisheries scenarios from the 1950s to 2000, the move towards mechanization, and the increase in the number of fishing vessels along the Indian coast. Most of the turtle mortality occurs in the east coast of India, and gill-nets account for the maximum mortality (60 per cent for the period 1997-98), followed by trawl nets and other

gear. An important caveat mentioned is that there could be an underestimation in the number of turtles stranded by trawlers.

Among the management and conservation initiatives suggested to reduce turtle mortality are spatial and temporal restrictions on gill-net fishery along the coast, and a precautionary and participatory approach to conservation. This section also highlights the lack of information on the stock size of turtle populations, leading to mere estimations of the extent of fishery-induced damages, which are thus not assessed properly.

The next three chapters in this part explain the working of the turtle excluder devices (TEDs). Chitta Ranjan Behera highlights the perspective of the trawling community in Orissa on TEDs. He explains the stand of the trawler-owners and their criticism of the TED model from the Central Institute of Fisheries Technology (CIFT). Behera draws attention to the 'trawl guard', an indigenous device developed by the local fisherfolk of Orissa, which performs the function of the TED in a more fisher-friendly manner.

Awareness campaign

According to another chapter in this part, the implementation of TEDs in the coastal waters of Andhra Pradesh, a State in south India, involved awareness camps and demonstration workshops. The general consensus seems to be that the interests of

fishermen should be taken into consideration for the effective implementation of TEDS.

Most of the recommendations in these chapters call for participatory conservation methods, where communities—especially fishing communities—are involved and their needs, particularly livelihood interests, are taken into consideration. Roshni Kutty explains the various community-based conservation initiatives in India, highlighting the efforts in two States, Goa and Kerala. In Goa, the community has been involved in turtle conservation and hatchery initiatives, and turtle nesting sites are used to attract tourists.

In Kerala, the educated youth of a village have been involved in turtle conservation and hatchery initiatives to save the endangered species and thus protect the habitat in the process. The chapter also evaluates the community-based initiative in Rushikulya, Orissa, where fishing communities have been part of 'Operation Kachhapa', a conservation effort initiated by external NGOs. Operation Kachhapa supports government enforcement, monitoring and research activities, protection of nesting sites, public awareness programmes, training programmes and various legal initiatives. The chapter reveals how monetary benefits are important to get people to respond to conservation education and awareness.

Part 7 provides an indepth analysis of the various legal instruments that are currently in place for conservation of turtles. The first chapter delineates the various Indian laws enforced by the central government for the use, protection and conservation of marine areas, highlighting the important provisions. It also provides a brief overview of the various international instruments that relate to conservation of marine areas, protection of species and habitat. The chapter explains the working of these instruments, classifying them into those directly dealing with marine turtles like the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC), and

explains the provisions under the Convention on the Conservation of Migratory Species of Wild Animals (CMS) along with the various memoranda signed for conservation of turtles. It also explains the importance of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the various Conference of Parties decisions, and the method of listing species in this convention. It also provides relevant information on the debate of turtle listing and trade in turtle products. This exhaustive analysis also covers other instruments that have indirect impact on marine turtles, including the 1995 Code of Conduct for Responsible Fisheries of the Food and Agriculture Organization of the United Nations (FAO), and the agreements under the World Trade Organization. The chapter lists the various bilateral and trilateral agreements in place for the conservation of marine turtles in the Asian region.

The last part of the book is interesting, as it takes up the various problems in methodology mentioned in the first chapter. There is no standard format for assessing turtle mortality, and turtle nesting, and the lack of data has hindered the formulation of management plans. As different agencies have used a variety of approaches and methods to assess the same information, there is a need for collaboration between research and management agencies. One chapter explains how the migration and movement of olive ridley turtles have been tracked in the east coast of India, using conventional metal tags and satellite telemetry, and traces the movement of the turtles from the nesting grounds to the feeding grounds. Other chapters highlight the use of remote sensing technology to characterize the land parameters of nesting habitats, the effect of geomorphology on olive ridley nesting beaches and the effect of marine pollution on marine organisms.

Current research

Most of the chapters provide information relating to India, using the results of research conducted during 2000-2002. More recent research output would have provided better insights into the current situation. The editors could also have gone to some trouble to unearth and detail

some of the other initiatives in India besides the GOI-UNDP project to protect turtles.

A recent initiative relates to the Indian State of Orissa, where the Orissa Marine Resources Conservation Consortium (OMRCC) was formed. The OMRCC is made up of fishworkers' unions of Orissa, conservation organizations, development NGOs, turtle biologists, and individuals interested in marine turtle conservation measures and/or sustainable fisheries in Orissa.

Also worrisome from the point of view of academic rigour is that some of the research activities mentioned in the publication were undertaken for a short period, not long enough a time span to draw definitive observations and conclusions. The book could have done with a glossary of terms for non-biologist readers interested in turtle conservation. Most of the chapters provide recommendations, and highlight the lacunae in the respective research areas. If compiled separately, they would have proved useful in setting the agenda for future research.

The book provides a list of organizations that work on turtle-related research in India, and also an extensive index, which is very helpful in locating information quickly. Overall, this book will be useful

for turtle biologists, researchers working on turtle-fishery interactions, and policymakers and other activists. Between its covers can be found a stimulating assemblage of information and reflections that could form the springboard for future research and policy.

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