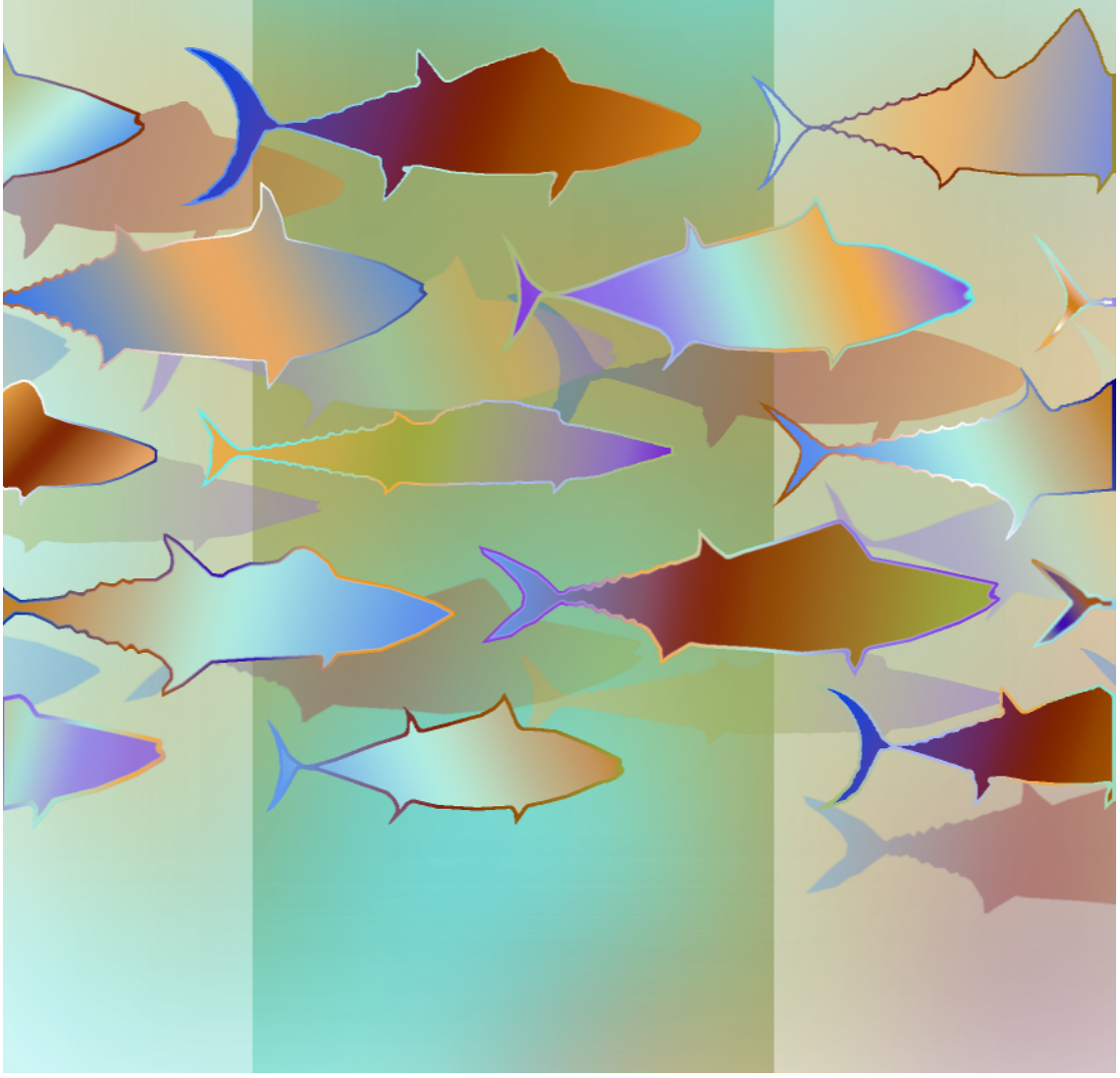
Status of Exploited Marine Fishery Resources of India



STATUS OF EXPLOITED MARINE FISHERY RESOURCES OF INDIA

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Marine Turtles and Mammals

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1. Marine turtles

Marine turtles were common 130 million years ago in the Cretaceous period and their fossil record dates back at least 200 million years. They lived together with dinosaurs. They are air-breathing vertebrates secondarily adapted to aquatic life. The major aquatic adaptations involve the evolution of paddle like forelimbs and high reproductive rate to compensate mortality at early life. An adult female may lay about 1000 eggs in a breeding season, out of which only 2 to 3 hatchling might reach adulthood and return to the same site to nest where they were hatched. They are reported to have a long life span perhaps upto 100 years.

Five species of sea turtles are known to inhabit Indian coastal waters and Bay Islands. In the order of abundance they are the olive ridley Lepidochelys olivacea, the green turtle Chelonia mydas, the hawksbill Eretmochelys imbricata, the loggerhead Caretta caretta and the leatherback Dermochelys coriacea.

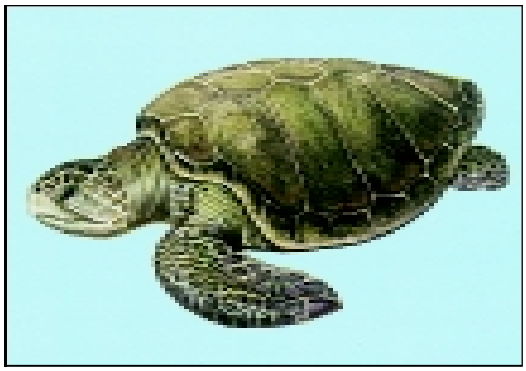

Fig. 1. Lepidochelys olivacea

Olive ridley: The olive ridley (Fig. 1) is India's commonest sea turtle. Gahirmatha, Devi River mouth and Rushikulya River mouth in Orissa, provide the largest concentration of sea

turtles anywhere in the world. One of the most spectacular activities of marine turtles is the mass nesting or arribada of the olive ridley along north Orissa coast, India. The unique phenomenon of arribada occurs almost regularly every year during January-April and was first brought to light by Dr. Bustard in 1976.

Green turtle: The predominantly vegetarian green turtle (Fig. 2) named after the colour of its greenish fat is the tastiest of sea turtles. In the mainland of India, Gujarat is the stronghold of nesting green turtles, though some members also nest on the remote areas in Lakshadweep and the Andaman and Nicobar Islands.

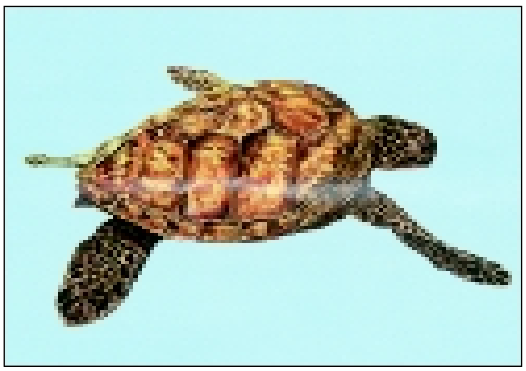

Fig. 2. Chelonia mydas

Hawksbill: The hawksbill (Fig. 3) is one of the smallest sea turtles. It is found only in scattered numbers among coral reefs and rocks in Lakshadweep, on the coasts of southern India and in the Andaman and Nicobar Islands. It feeds on sponges, crabs and molluscs. The hawksbill occasionally eats creatures that are poisonous to man making its meat poisoning too.

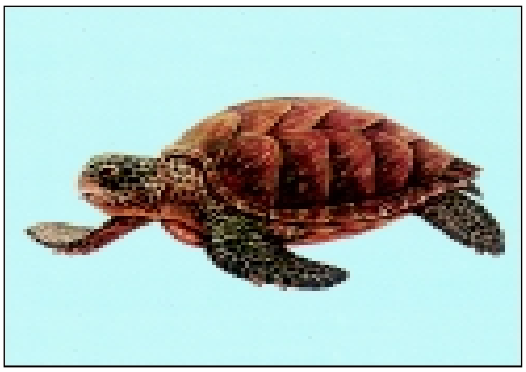

Fig. 3. Eretmochelys imbricata

Loggerhead: The loggerhead's name refers to the size of its head, which is larger in proportion to its body than other sea turtles and easily recognizable by the reddish brown colouration (Fig. 4). It is found in Indian waters only in the Gulf of Mannar. In coastal waters the loggerhead feeds mainly on crabs, fishes and benthic organisms such as sponges and algae.

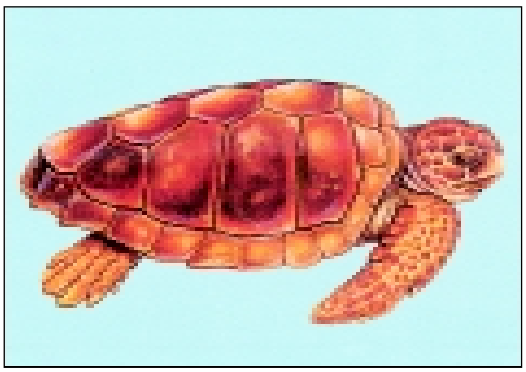

Fig. 4. Caretta caretta

Leatherback: The leather-back or the leathery turtle (Fig. 5) so called because of the thick, oily, leathery tissue that covers the bones of its shell and weighs around 500 kg. Due to poaching the nesting colonies of this giant turtles have disappeared from India's mainland beaches. They exist today only on remote beaches of Little Andaman, Great Nicobar and Katchall in the Andaman and Nicobar Islands.

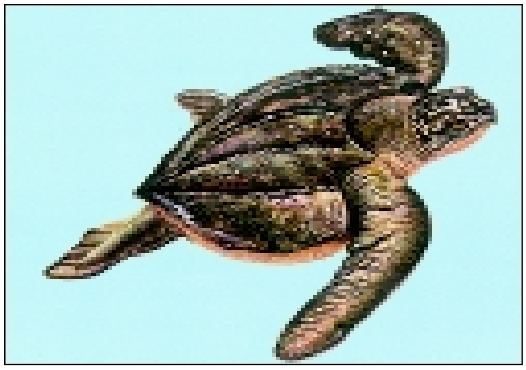

Fig. 5. Dermochelys coriacea

Conservation

At present all the 5 species of turtles occurring in Indian seas are protected as they are placed in Schedule I of the Indian Wildlife (Protection) Act 1972 as per the Amendment made to the Schedule in September 1977. India abides by the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) which prohibits the trade in turtle products. In June 1981, India became a signatory to the Bon Convention on the Conservation of Migratory Species of Wild Animals. In 1975, to protect mass nesting of olive ridley turtles nearly 65,000 ha area of Gahirmatha, Bhitarkanika in Orissa was declared as wildlife sanctuary. All the five species of turtles are highly migratory and visit parts of our coast and the islands of Lakshadweep and Andaman and Nicobar for nesting during certain months. Some of the marine habitats such as coral reef areas in the Gulf of Mannar, Andaman and Nicobar Islands and Lakshadweep form the feeding grounds for turtles. None of the species are endemic and may undertake long migration to feeding and breeding grounds often across international boundaries.

The explosive trade, which sprang up for the olive ridley in the late seventies and early eighties despite the Indian Wildlife (Protection) Act, created considerable concern at the national and international level. A major threat still persists is the incidental catch of turtles in fishing gears like gill net resulting in conflict between conservationists and fishing communities. Along the Indian coast, 3,190, 2,605 and 1,927 turtles were incidentally caught by fishing gears during 1997, 1998 and 1999 respectively barring mass nesting areas. To reduce the mortality due to incidental catch, two options namely closure of fishing during mass nesting period and attachment of Turtle Excluder Device (TED) to the trawl nets are suggested.

Sea turtle research

The CMFRI has developed a national sea turtle research programme for (1) surveying and demarcating nesting grounds of marine turtles along the Indian mainland coasts and the Bay Islands, (2) monitoring incidental catch of turtles in fishing operations and finding ways and means of minimizing the same, (3)

developing hatchery and hatchling release programme, (4) investigating biological aspects and behaviour of turtles and (5) Strengthening the National Marine Living Resources Data Centre (NMLRDC) for the acquisition and dissemination of data on marine turtles from Exclusive Economic Zone (EEZ) of India.

2. Marine mammals

The world marine mammalian (Cetacean) diversity include about 87 species of whales, dolphins, porpoises and dugong. They occur from the Polar to tropical waters either as denizens or migrants. They serve as important indicators of the health of the marine ecosystem and exposure and effects of pollutants. They are widely hunted from various parts of the world oceans for their flesh, oil and other products. Due to their large size, docile nature, low birth rate and long life span they become highly vulnerable to overexploitation. Thus many species have become rare or endangered, paving the way for enactment of appropriate rules, regulations, laws by many user countries to conserve the marine mammals for biological and ethical reasons.

Twenty-two species of marine mammals are catalogued from the seas around India. They frequent the coastal waters, for feeding or breeding, where they get entangled or entrapped in the fishing gears such as trawl net, gill net or purse seines, that are operated for exploiting other resources. As all marine mammals are protected under the Indian Wildlife (Protection) Act, 1972, there is no organised exploitation. However, there are clandestine catches of the most desired dugongs, which go either unnoticed or unreported.

The data on marine mammals from the Indian seas are drawn mostly from their capture or stranding reports from different parts of the coast and stored in the NMLRDC of CMFRI for future management use. Among them, the whales constitute the dominant group. They migrate seasonally to tropical waters for breeding or to escape climatic extremes; during the course they get stranded in gently sloping beaches, murky water and tidal sites. Most of our available information on whales comes from a few dead carcasses that were washed ashore along different parts of the coast from time to time. The species of toothed whales stranded were Physeter macrocephalus (Sperm whale), Kogia breviceps (Pigmy sperm whale) and Ziphius cavirostris (Cuviers beaked whale); the stranding of the former was reported mostly from areas below 15^0 N latitude and along islands during October -February period. Their gestation period lasts 12-15 months. Most of them are piscivores.

The baleen whales stranded were Balaenoptera muscules (Blue whale), B. borealis (Sei whale). B. physalus (Fin whale) , Megaptera novaeangliae (Humback whale), B. edeni (Bryde's whale) , B. acutorostrata (Mink whale), and Balaena australis (= B. gracilis)(Australian whale). Most of their strandings were reported from the west and southeast coasts during December -May and August- October. Their gestation period lasts 7-12 months depending on the species and the adult feed on plankton. Though they are found in the upper euphotic zone of the sea, are also capable for extensive deep dives.

The common species of dolphins stranded or caught are Stenella longirostris (Spinner dolphin), Tursiops truncatus (Bottlenose dolphin), Delphinus delphis (Saddleback dolphin), Sousa chinensis (Humpback dolphin) and Grampus griseus (Risso's dolphin) all of which grow to 2.5 - 4.0 m. S. longirostris is the commonly caught (44% of the total dolphin catch) species from areas between Mumbai and Kochi with greater frequency during August - November . The killer whale, Orcinus orca; false killer whale, Pseudorca crassidens and pilot whale, Globicephalus macrorhynchus are also stranded at different parts along the coast either singly or in groups. Their length ranged from 5.3 to 9 m.

The sea cow, Dugong dugon is a docile animal reported from the Gulf of Mannar, Palk Bay, Gulf of Kutch, Malabar, Madras and Orissa coasts. They are common in the Gulf of Mannar and Palk Bay, where a fishery was in existence. It reaches 3-5 m and more than 470 kg; feed exclusively on sea grass and weeds. Its meat is considered as a delicacy among coastal fish eaters. Until 1984, it formed a fishery with an annual catch of 25-200 numbers. Although its fishery is banned, there have been clandestine attempts at its capture. Due to its docile nature, large size, friendly behaviour, economic value coupled with human ignorance and indifference, it has been indiscriminately hunted and its stock is depleted or destroyed. The degradation and denudation of its unique feeding habitat has further compounded the devastation process and forced dugongs to seek similar pristine habitat elsewhere.

Conservation

The protection and conservation needs of these pinnacle predators are felt globally. Therefore, the international bodies like IWC, UNEP, UNCLOS and IUCN have taken all efforts to protect, conserve and judiciously manage the marine mammals in their entire range of distribution/migration. The Management and utilization of Marine Mammals Action Plan (MMAP) developed jointly by UNEP and FAO way back in 1978-83 took initiative to "promote the effective implementation of a policy for conservation, management and utilization of marine mammals, which would be widely accepted to governments and the public." The global Meeting of Regional Seas Convention and Action plans held in Monaco (November, 2000) discussed the need to retool the MMAP to increase its relevance and usefulness with the support of a broad modernized and better resource Action Plan taking into confidence all user countries.

In order to fulfil our international obligation and on ethical grounds, India too have to safeguard the endangered marine mammalian stocks/migrants in our seas for which basic data on their distribution, habits, behaviour, stock characteristics, migration and biology are imperative. We are well aware that, apart from what has been documented so far, the actual number of dolphins/dugongs, which are caught, accidentally or illegally, must be far higher than what are reported. A strong and actual database on such killings is also vital to achieve our objectives in this direction. Further, in a developing country like India, where economic requirements of common man mask and overrule his environmental and ethic thinking, as at present, any

attempt at protection of these vulnerable marine creatures is possible only through a co-operative spirit and voluntary involvement by all user groups, rather than by enforcing legislation.

The country is at the threshold of solving major threats, to the well being and survival of marine mammals, such as habitat degradation, predation of their calf by sharks, directed hunting, opportunistic netting and illegal capture. The suggestions to mitigate the anthropogenic threats are: (1) ban their catch, intentional or unintentional and the trade if any, (2) replace destructive gear with BED fitted gear, and acoustically opaque gill nets, (3) establish marine parks and sanctuaries, (4) curtail irrational fishing in vulnerable habitats and destruction of sea grass meadows, (5) accurate reporting of all stranding / landings and strengthening of research and monitoring programmes and generation of basic data, (6) bilateral/multilateral co-operation with provision for adequate funds to tackle related and common problems, (7) publication of public awareness materials and conduct of awarness campaign, (8) make the legal machinery more stringent to accommodate the entire EEZ in the conservation strategies, (9) all severely depleted and catalogued species should be brought under CITES regulations and listed under Appendix 1 and (10) setting up of a 'National Marine Environment Protection and Resource Conservation Authority' (NMEPRCA) with wide and constructive and legislature powers to protect, conserve and audit the marine ecosystem and its diversity.

3. Suggested reading

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