

# CONSERVATION AND STATUS OF SEA TURTLES IN ORISSA

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## INTRODUCTION

Conservation of wildlife is achieved through the following main approaches. First, by protecting the endangered species by law from being disturbed, killed or otherwise exploited and by its proper implementation nationally and internationally. Secondly by setting aside core areas of each habitat as Nature Reserves, Sanctuaries, National Marine Parks and Biosphere Reserves, etc., where wildlife can continue to exist in a purely natural state. Thirdly by educating the lay man who interact with wildlife about the need for both conservation and research, as without their involvement and co-operation wildlife conservation would be impractical. Finally, by undertaking indepth scientific research to understand the behaviour and basic biological needs of the species in order to formulate future management programmes based on sound footings.

In the international context there exists a very strong protective policy for sea turtles. All species found in India have been included in Appendix-I of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). India ratified CITES in 1975 and it came into force in October 1976. The species have been included in the IUCN Red Data Book as 'Endangered' which means that the 'taxa is in danger of extinction and whose survival is unlikely if the casual factors continue operating'.

In India all the five known species of sea turtles are now fully protected from hunting, killing and other forms of exploitation under the Indian Wildlife (Protection) Act, 1972 by an amendment of the schedules in September 1977.

In the above amendment excluding the flatback sea turtle *Chelonia depressa*, six species were included in the list of Schedule-I

animals along with the locally unreported Kemp's ridley *Lepidochelys kempii*. Changes were made in the revised list of Schedules (Government of India letter No. 1-28 78-FRY(WL) dated 12th September 1980 effective from 2nd October 1980). *Lepidochelys kempii* was then removed from the list as it is not known to occur in Indian waters.

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#### ESTABLISHMENT OF NATIONAL PARKS AND SANCTUARIES AND EXTENSION OF THE LIMITS OF EXISTING SANCTUARIES

The limits of the Bhitarkanika Wildlife Sanctuary in Orissa, gazetted vide Government of Orissa, FFAH Department Notification No. 4F (W)-34/75 6958 dated 22nd April 1975 may be extended northwards to include Wheeler and Shortt's Islands, inadvertently omitted from the original gazettelement; and southwards to include Hukitola Island near False Point terminating near the port of Paradip to include the long narrow sand spit much used by nesting ridleys as suggested by Kar and Bhaskar (1982).

The status of Bhitarkanika Wildlife Sanctuary may also be upgraded to the level of a National Marine Park or Biosphere Reserve for protecting sea turtles, estuarine crocodile and the last remaining mangrove ecosystem in the State of Orissa. The mangrove are unique but dwindling fast due to human encroachment.

Another marine reserve or sanctuary (Kujang-Astarang Wildlife Sanctuary) may be constituted at the southern extreme end of Cuttack District of Orissa covering the newly discovered mass nesting ground of ridley turtles near the Devi River mouth (Kar, 1982). From north to south this should include the coastal belt of Kujang Range of Cuttack District and the coast line of Puri District upto Astarang. A number of river mouths and sand spits occur in the above places, which are nesting areas of ridley sea turtles.

While establishing the above Marine National Park, Biosphere Reserve, Marine Reserve etc., adjacent nearshore waters and a buffer zone further offshore are required to be included in order to protect marine turtles while they are breeding and migrating in the vicinity.

In the plan to protect sea turtles and other wildlife of Orissa State, the Forest Department of the Government of Orissa has taken initiatives for establishing two additional sanctuaries (as detailed below) along the Orissa Coast. These sanctuaries originally intended for black buck and birds incidentally possess sea turtle nesting beaches. Proposals relating to the approximately 12 sq. km Konark-Balukhand Sanctuary in Puri District were sent by the Forest Department to the Government of Orissa in July 1980.

The limits of the proposed Konark-Balukhand Sanctuary presently include approximately 40 km of the coast line in Puri District terminating at the north end near Keluni Muhana. This may be extended 8 km further north to include about 48 km of the coastline within the sanctuary limits to protect important sea turtle nesting grounds, on the northern side of the river mouth near Keluni Muhana.

The proposed Chilka Wildlife Sanctuary with an area of approximately 900 sq. km includes parts of the Puri and Ganjam Districts of Orissa and contains the largest brackish water lake in the country. The proposal of the Orissa Forest Department in May 1979 was specifically for protecting the various species of migratory birds. The sanctuary's eastern boundary bordering the Bay of Bengal has long coastal stretches favoured by nesting olive ridleys and

possibly other sea turtle species. The area of this sanctuary should therefore, include a buffer zone further offshore, extending out to the edge of the continental shelf. In addition to the above major nature reserves it is necessary to preserve small areas of significance, such as nesting beaches and breeding grounds of marine turtles, after detailed surveys locate and identify such key areas.

In the neighbouring States of Orissa *i.e.*, West Bengal and Andhra Pradesh, there are possibilities of locating mass nesting ground of sea turtles particularly in the sandy beaches and islands of Sunderbans (W.B.); and the Godavari and Krishna deltas of Andhra Pradesh (Kar, 1983). Both of these areas have mangrove forests and a number of sand spits at river mouths which may constitute nesting habitats for ridleys.

#### GAHIRMATHA : THE PRESENT SITUATION, POACHING AND THE TRADE IN SEA TURTLES

Olive ridley visits Gahirmatha Coast in Bhitarkanika Wildlife Sanctuary, Orissa annually for mass mating offshore during November and December and mass nesting on the beach in January-March (to a lesser extent during April-May). Thousands of sea turtles are seen floating on the surface in the sea during the breeding period. Poachers, mainly from West Bengal operating with powered vessels, trawlers and country boats, find it easy to catch these turtles in the absence of any effective agency to enforce the protective legislation on the high seas. The catch is unloaded at Digha and other adjacent places of the West Bengal Coast and transported to the Calcutta market by land routes for disposal despite the existence of check posts. Therefore, additional check posts should be established near the border areas of Orissa—West Bengal and within the states for better control and check on movement of sea-turtles and their products. Necessary instructions should be issued to the staff posted in these check posts to exercise strict control and to book cases against the transport of sea turtles, their meat and other products by road inside West Bengal.

ROLE OF ORISSA FOREST DEPARTMENT, INDIAN NAVY AND THE  
INDIAN COAST GUARD SERVICE

Joint patrolling by Forest, Police, Navy and Coast Guard officials actively protected the olive ridley off Gahirmatha coast and in the Bay of Bengal during 1981-82, 1983 and 1983-84 nesting seasons. The services of the Coast Guard ships were utilised in making anti-poaching sorties in the Bay of Bengal in the above years. With timely help from Coast Guard and police personnel, and the Coast Guard patrolling vessel *Rajhans* on 6th and 7th February 1983 the Forest Department Personnel of Orissa successfully patrolled the coastal waters between Paradip and the Dhamra mouth. For the first time 61 poachers were arrested at sea and their vessels compounded. A total of 9 cases have been instituted against the offenders in which 3 motor launches and 10 country boats were also seized. The arrested persons were all from West Bengal. They were produced before the Judicial Magistrate at Kendrapara (Orissa), but the above cases are still pending in the court. The timely action taken by the alert Forest Department of Orissa needs appreciation.

Sea worthy motor launches and speed boats should be acquired by the Orissa State Forest Department (the main executing agency) to monitor the waters off Gahirmatha Beach and to control the incidental killing of adults at sea, which at present is rampant.

To render necessary help and assistance to the Forest Department personnel of Orissa in the aforesaid sea patrol, it is necessary that help of the Coast Guard also be inducted during the mating and nesting seasons of the olive ridley (September to March). After March, the sea usually becomes rough preventing the poachers from operating and so routine patrol in the sea may not be necessary thereafter.

Some poaching occurred in the months October to December (Mating period) and immediately thereafter, in past years. During February 1983 two patrol vessels and a naval helicopter patrolled the area and a shore liason office was positioned at the Gahirmatha 'rookery' for contact and assistance. During the 1983-84 nesting season the Gahirmatha Coast was also regularly patrolled by

helicopter and small low flying planes of the Indian Coast Guard Service. It is understood that the patrolling activities and the sea turtle protection operations will be streamlined and made more systematic in future by the Indian Navy and the Indian Coast Guard. It is hoped that with this type of protection mating will continue undisturbed and more females will be able to reach the coast unmolested.

As in 1982-83 the presence of Indian naval ships in coastal waters off Orissa, should also be sought for in order to discourage trawlers of all nations from illegally exploiting turtle resources in our Exclusive Economic Zone (EEZ).

Annually about 50,000 turtles were exported from the Gahirmatha area alone between the 1970's and the 1981-82 season. During the 1982-83 nesting season alert action and vigilance by forest officials of the Governments of Orissa and West Bengal reduced poaching of sea turtles considerably. In spite of this an estimated 10,000 live turtles were clandestinely landed between mid-December, 1982 to the end of February, 1983 at Bhanshalghat from where they were transported to Calcutta and Tatanagar for marketing (Silas *et al.* 1983). Moll, Vijaya and Bhaskar in their survey report relating to West Bengal during February 1983 have also reported that 'in West Bengal the trade in olive ridley sea turtle was continuing more under cover but seemed to be flourishing as well as ever' (Moll, 1983).

During the 1983-84 nesting season sea turtles were transported to Calcutta's Howrah market from Digha and the adjoining places, the number for the season is estimated at a few thousand (Silas *et al.*, 1984). The datewise observations by Shri P. C. Roy Choudhury, Deputy Director, Wildlife Preservation, Eastern Region, Calcutta and the Inspector of Police have been given below.

<i>Date of inspection</i>	<i>No. of turtles brought for sale</i>
5.12.1983	15 to 20 Nos.
6.12.1983	22 Nos.
7.12.1983	7 Nos.
8.12.1983	16 Nos.
9.12.1983	36 Nos. Lorry No. WBQ 6528

10.12.1983	58 Nos. Lorry No. WBQ 6512
11.12.1983	87 Nos. Lorry No' WBQ 3512
13.12.1983	64 Nos. (Out of this 26 were brought by rail)
14.12.1983	33 Nos.
16.12.1983	15 turtles + 25 tied bamboo boxes each containing 2 to 3 turtles.

Mr. P. C. Roy Choudhury (Pers. comm.) has reported that these observations were made in the morning hours between 7.00 A.M. and 10.00 A.M. and probably greater number of turtles were transported daily to Calcutta and despatched to different selling markets before inspection by officers. Further, a truck containing 74 olive ridley was seized at Rajkul checkpost by the West Bengal Forest Dept. on 30th Jan. 1984. All these turtles were from Orissa (Silas *et al.* 1984). Therefore, the law protecting turtles needs to be rigidly enforced in [the State of West Bengal and in Calcutta in particular, the main market for turtle meat and other sea turtle products.

A systematic inventory of turtle conservation laws is needed to determine where gaps in coverage exist and what the priorities of actions should be.

For example mechanised boats, trawlers and country boats and other accessory equipment used for offshore poaching of sea turtles and trucks, lorries, rickshaws, etc., similarly used on land should be confiscated by the Forest Department personnel as is being presently done under the recent amendment of Forest rules by the Government of Orissa for forest offences.

The railway authorities (Commercial Superintendent, S.E. Railway, Khurda Road Division and Kharagpur Division) were moved from time to time by the Forest Department of Orissa since 1975 to stop the booking of sea turtles from all coastal rail heads in Orissa and West Bengal. This was largely implemented, but turtles were still being booked to Howrah from a few stations during all the seasons upto the current (1983-84) nesting season (Silas *et al.*, 1984). Immediate action is therefore, needed to stop this.

In addition trained Forest Department Staff and Railway officials should also be on the look out for the false documentation and declaration of sea turtles and their products as fishery products.

#### INCIDENTAL CATCH: NEED FOR FISHING REGULATIONS

A new major threat observed during the 1982-83 nesting season is that unlike previous years large numbers of mechanised fishing and country boats were operating off the Gahirmatha Coast just in front of the mass nesting ground — from bases such as Paradip Port and Dharma fishing harbour situated on either side of the Gahirmatha rookery. In the same season, 3,000 breeding size turtles were found dead in a roughly 10 km stretch of our study area alone and the area looked like a graveyard during the nesting season (Silas *et al.* 1983). The same or slightly smaller concentration of the dead turtles was also found along roughly an additional 60 km of the coast northwards. During the 1983-84 nesting season about 600 turtle carcasses were found washed ashore in the Gahirmatha study area and another 500 carcasses in Hukitola Island. These are exclusively the result of incidental catch in fishing nets.

Therefore, in order to stop incidental catch in offshore areas all coastal states should be prepared to establish restricted fishing zones in areas of high turtle concentration (as has been done by Mexico, near Rancho Nuevo and by the United States, near Cape Canaveral).

For Orissa a minimum of 10 km wide strip of coastal water extending from Palmyras Point near Wheeler Island to False Point near Hukitola Island *i.e.*, from latitude 20°47'N to 20°16'N should be declared off limits to all fishing activities during the month September through March-April.

The Honourable Chief Minister of Orissa Shri J. B. Patnaik and Srimati J. Patnaik, M.P. have verbally agreed to the above proposals during their recent visits to Gahirmatha on 31st December, 1983, and 29th-30th January, 1984, to witness the mating and mass nesting of sea turtles.

## MARKET SURVEYS

Market surveys are essential for gathering information about sea turtle products, trade routes, etc., as well as local consumption of these products to provide a firm base for future action. Market surveys would help to identify the ultimate outlets for the products. A suitable strategy to discourage consumption will be evolved after more reliable data is available.

## THREATS TO SEA TURTLE HABITATS AND THEIR PROTECTION

### *Beach Erosion*

Approximately 20 km of the Gahirmatha Coast north of Chinchiri Muhana are being eroded by the sea. Apart from seasonal fluctuations (erosion and deposition) annual erosion at the rate of at least 5 metre per year has been recorded over the last 5 years. Two forest blocks along this coast have been washed away and dead remnants of mangroves are visible at low tide along many stretches (Silas *et al.*, 1983). It is possible that the cause for this erosion is the regular removal of sand from the upcurrent breakwaters at Paradip Port and the consequent depletion of sand carried by littoral drift. This sand is mined partly for land development inland and the balance being dumped in the deep waters offshore. Shri S. N. Bhanjh Deo, Member, State Flood Control Board draws attention to this possibility in his report 'Flood control and allied problems of Orissa rivers (Page 22)' published by the Government of Orissa. The matter urgently requires a multidisciplinary approach and studies to ascertain the causative factors of erosion. It is hoped that the concerned engineers take up a study to determine the exact causes and recommend palliative measures.

### *Plantations along the Beach*

Efforts to create coastal shelter belts by raising plantations and construction of palisades in islands and coastal areas important to nesting turtles should be carefully examined. Extensive plantation activities and construction of palisades, etc., may be threatening important nesting beaches and simultaneously introducing new

predators as occurs at Gahirmatha. This may have an adverse effect on the nesting habitat and on the turtles themselves. Therefore such plantation programmes should be stopped completely along at least 10 km of concentrated nesting beach at Gahirmatha, along 5 km at the northern extremity of Hukitola Island, along 4 km immediately north of the Devi River mouth and along favoured stretches as yet undiscovered.

Further, since most mass nesting of olive ridley sea turtles throughout their circumglobal range takes place on sandspits at river mouths, no plantation should be attempted at existing sandspits near river mouths and islands. On other sandy beaches a 50 metre wide stretch of beach inland of the spring high tide line (highest tide mark of the year) requires to be left untouched and free from all sorts of plantation and other developmental activities. Gradually developing sandspits and sandy islands should also be carefully examined before manipulating the habitat.

Further, no manipulation of sea turtle habitats (nesting beaches as well as foraging grounds which includes the feeding ground and migratory routes i.e., marine and estuarine habitat of sea turtles) for food, water, shelter, mineral requirements, tourism, oil drilling installations should be done. Turtle habitats should be completely protected from pollution and the detrimental effects of all possible external influencing factors.

#### *Protection to Mangrove Forests*

Conservation problems such as encroachment, felling of mangrove trees along the coastal belt and illegal fishing in estuaries, rivers and creeks, are being encountered inspite of protection (in Bhattarkanika) and may apply to all such habitats. A stringent action plan and its implementation is needed to stop this.

Since mass nesting habitats of olive ridley all over the world are very closely linked to the presence of mangrove habitats in the vicinity, all such habitats in India which by themselves are now endangered, should be listed in an inventory. This initial step will pave the way to protect the mangroves and their associated sea turtle habitats in India.

### *Protection to Feeding Grounds*

Complete protection should be afforded to coral reefs and coral islands. These areas should be declared as marine reserves being important feeding and nesting grounds for some species of marine turtles.

## NON-HUMAN THREATS TO SEA TURTLE EGGS, HATCHLINGS AND THEIR PROTECTION

### *Predation*

Mammals are the major predators on ridley nests at Gahirmatha rookery. During sporadic nesting which occurs throughout the year, single nests are almost always destroyed by one of the following: wild pigs, feral dogs, jungle cat, hyaena, etc. This normally occurs within twenty four hours of completion of nesting unless they are transferred to a protected hatchery. Nest predation is most heavy between Habalikhati and Ekakula since the nesting beach is immediately backed by dense casuarina and mangrove forests. Predation is relatively less on the stretch of beach between Ekakula and Ekakulanasi area. Birds are the secondary predators of ridley eggs. Although they have not been observed to dig into the nests they consume the exposed eggs by both mammalian predators and nesting female turtles from the previous night.

Protection measures presently undertaken by the Orissa Forest Department at Gahirmatha include:

- (i) During arribadas translocation of nests laid below the high water mark which are liable to be destroyed by inundation during the subsequent high tides to a centralised hatchery.
- (ii) After peak nesting season transfer of nests laid by the sporadic nesters to the hatchery.
- (iii) Throughout the peak nesting season (December-May) assiduously patrolling the beach by employing more number of watchers to protect the nests from various beach predators and poachers.

- (iv) During the peak hatching period by regularly patrolling the beach upto 10.00 A.M. in the morning the forest department personnel collect hatchlings which fail to reach the surf before dawn. Such action helps to protect the hatchlings from the dangers which they may face while crawling along the hot beach sand as well as from the avian predators.

A few more suggested measures to prevent the nest destruction by beach predators include :

- (i) fencing the stretches of concentrated nesting beach where predation is heavy.
- (ii) Spreading plastic or nylon nets over the beach immediately following an arribada.
- (iii) Spreading electric wires along the forest edge.
- (iv) Extensive patrolling of the beach to scare away the predators and
- (v) Killing or preventing the feral dogs from entering into the rookery.

#### *Conservation Education*

A recommendation should be made to the postal department to produce postage stamps and postcards, inland letters, envelopes etc., relating to the plight of sea turtles and the value of this wildlife heritage. Such stamps have been produced by many countries to increase conservation awareness.

Turtle meat is eaten virtually by no Oriyan. On the other hand turtle meat and eggs are favourite food item and are much relished in West Bengal. Therefore, an extensive publicity extension programme should be conducted (as has been done by the CMFRI on an experimental basis) during the forthcoming breeding season, which commences in mid-October. Efforts need to be concentrated mainly in the problem areas *i.e.*, in all coastal villages and towns of West Bengal including Calcutta, the main market for the meat, eggs and other sea turtle products in India. This will greatly help in reducing the heavy offshore poaching of ridley in Orissa.

The presence of volunteers and staff in the above places will also help to collect and transmit forest intelligence and other information on poaching or movement of sea turtles and its nest, eggs etc. to the West Bengal Forest Department for necessary action at their end.

Turtles and their value as a national heritage should be highlighted in various local, regional languages particularly for children in the form of posters, informative pamphlets and school textbooks.

Conservation organisations such as BNHS, WWF (India) the Department of Environment and the ICAR should provide leaflets on the sea turtle conservation programmes for general distribution.

Travelling natural history museum exhibits on sea turtle ecology and conservation should be launched.

Sea turtle hatcheries which are being established in different states should always give priority in employment and training to local people as is being done at Gahirmatha turtle research centre.

Distribution of coloured photographs illustrating different species of sea turtles along with questionnaires in regional languages would help to train local people in identification of different sea turtle species. It will aid in gathering information about local turtle populations.

Publicity and conservation education through the media of radio and TV, etc. would have a useful effect in creating public awareness for sea turtle conservation.

In order to increase the conservation awareness amongst the people, the Orissa Forest Department has already taken the initiative for producing a documentary film on sea turtle 'arribadas' at Gahirmatha having deposited necessary funds for the purpose. The film to be produced by the I & P.R. Department of Government of Orissa is in process. This documentary film when completed will be a unique wildlife film and therefore, the I & P. R. Department should give first priority in producing this film during the forthcoming nesting season of the species.

*Research Priorities*

A few lines of research work important to sea turtle conservation which have been identified during the course of the research works in Orissa are described below.

The long term tagging programme initiated for the first time in India at the Gahirmatha rookery by Orissa Forest Department with assistance from GOI/FAO/UNDP as part of the crocodile conservation programme in India, should continue so as to achieve and maintain a total saturation tagging programme for the ridley sea turtle population as quickly as possible. Therefore the FAO/UNDP may be requested by the Government of India to continue providing necessary tags, other equipment and also to provide financial and pragmatic support to this global conservation programme.

A programme for aging hatchlings and head started ridleys should be initiated and maintained for a few years at Gahirmatha to determine wild growth rate, age at maturity and homing instinct of nesting females to their natal beaches.

Ecological and behavioural studies of turtles on their foraging grounds and at points along the migratory routes should be initiated.

Experiments designed to investigate the 'lost year' mystery of sea turtles by radio tracking and telemetry are required.

Experiments be designed to know where and how far olive ridley turtles go between peak mating and the first and second mass nesting periods on the Gahirmatha Coast, Orissa. Remote Sensing and Telemetry studies would be most helpful for this.

The Department of Environment and the National Wildlife Institute of the Government of India should get involved through association with the wildlife wings of the State Forest Departments to take up the above work urgently on a high priority basis with technical and pragmatic support from national organisation such as the Central Marine Fisheries Research Institute and International organisations such as FAO/UNDP in view of long term national interests and in order to support research work more meaningfully.

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