

**RECOVERY AND MANAGEMENT PROGRAMMES
FOR SEA TURTLES IN INDIA : THEIR VALUE,
LOGISTICS AND PROBLEMS**

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INTRODUCTION

There is a tendency to look at sea turtle species as a single unit, but it is important to realise that the five species found in



Indian waters all have unique aspects of their biology, status and conservation requirements. The hawksbill and green turtles are only abundant in the Bay Islands and Lakshadweep, while the leatherback and loggerhead are definitely scarce in our area. But the ridley populations that nest on our coast are, at least in Orissa among the most dense in the world. Accordingly, our approach to sea turtle conservation should begin with a more complete assessment of the biology and requirements of such species.

Sea turtle enthusiasts in the rich countries have developed a powerful lobby for total protection of sea turtle and largely ignore or denigrate the need to fulfil the management aspects of sound conservation programmes for the developing countries. This approach may look good for sea turtles now but it is short-sighted and harmful in the long run. To be brief, a balanced, open-minded, middle-of-the-road approach is definitely the right one for India.

HABITAT PROTECTION

Nesting Beaches

Surveys carried out by Kar and Bhaskar (1981) and others on the rest of the coast and islands have now pinpointed most of the main sea turtle nesting beaches. A few such as Point Calimere in Tamil Nadu, Gahirmatha in Orissa, Pirotan Island in Gujarat, Labyrinth Islands in the Andamans and in the Sunderbans of West Bengal lie within sanctuaries where protection should be guaranteed. The total extent of these protected beaches is less than 150 linear kilometers which is not much out of thousands of kilometres of coastline, while some of this region's most important nesting beaches (Little Andaman for leatherbacks, South Reef Island for greens and hawksbills, and several islands in Lakshadweep for hawksbills and greens) remain unprotected. A system of National Seashore Reserves is one way to consolidate protection and management for critical coastal habits.

Once the main nesting areas have been determined, protection can be planned in the manner most applicable to the particular beach. A few examples of problems and action taken will be illustrative.

(i) *Gahirmatha, Orissa* : (a) Sea turtle beaches included within Bhitarkanika Sanctuary (b) Protection of adjacent mangrove forests to deter erosion and maintain an intact estuarine ecosystem. Here it should be noted that another branch of the Orissa Forest Department entrusted with planting casuarina as a cyclone barrier has been slightly over-zealous and has started planting on the edge of the main turtle nesting grounds which could further limit the already cramped rookery.

(ii) *Pirotan Island, Gujarat* : Removal of sand for construction halted in this area after creation of the Marine National Park.

(iii) *Suheli, Lakshadweep* : Proposed construction of a lighthouse could adversely affect green turtle nesting there.

(iv) *Madras-Mahabalipuram beach* : Development of housing and beach resorts along the coast may deal the death blow to the

already heavily pressured ridley population here : Control on beach development, use of bright lights at night, pollution and other aspects must be considered in protecting nesting beaches near and in urban areas.

Feeding Grounds

Green turtles and hawksbills in particular are dependent on sea grasses and coral reefs in sheltered water. One of the two of these situations occurring on the mainland is protected (Marine National Park, Gulf of Kutch in Gujarat); but perhaps the most important areas, the Gulf of Mannar islands have yet to be protected. In both Lakshadweep and the Bay Islands, factors such as coral mining, deforestation and resultant siltation are destroying the delicate reefs. Other pressures on marine life in the islands point to the need for establishing adequate protected areas there and baseline studies to provide the rationale and guidelines for sustained conservation. Fishing techniques, particularly bottom trawling, should be assessed for permanent damage to turtle feeding areas. Among the earliest forms of animal and plant life to be affected by pollution of coastal waters are molluscs, algae and sponges. It is likely that already many habitats where these important turtle foods live have been rendered uninhabitable by oilspills, toxic chemical waste and raw sewage. All this points to the need for actual implementation of the currently evolving regulations on pollution control.

SPECIES PROTECTION

Patrolling by Land and Sea

Already Forest Department personnel in Tamil Nadu and Orissa have found it part of their duty to patrol beaches to deter turtle-egg poachers. Needless to say, to patrol the vast stretches of Indian beaches where only widely spread, sporadic nesting occurs today, would be impossible and must be limited to areas of concentrated nesting. Enlisting public help from interested towns people and fishermen (many of whom revere the turtle as holy) can be a valuable asset in controlling poaching on beaches. On turtle beaches in Mexico, armed soliders are posted as guards

(but this gives rise to complications). In the last two seasons, the participation of the Indian Coast Guard and Navy with patrol boats, plane and helicopter dramatized two important points (a) that such inter-departmental cooperation is essential to effectively protect sea turtles and (b) that if the protection of the sea turtle is to be the job of the State Forest Department they must get the necessary patrol boats and train personnel for the job and get out on the sea.

Market and Movement Control

While it may be difficult to effectively patrol the beaches and high seas, it is often much easier to stop commercial trade in turtles and eggs by market raids, check posts and intelligence contacts through the railways, trucking agencies and fishermen. The few taken for local consumption add up to almost nothing compared to the market sales, the largest one being in Calcutta which despite laws and raids continues. Others, such as the Tuticorin market, have gone underground, turtles being clandestinely sold on the beaches in early morning hours.

Incidental Take

Effective implementation of a 3 km inshore ban on mechanised trawlers helps local catamaran and countryboat fishermen as well as sea turtles and may be the single most important action to prevent the massive annual incidental take (over 3,000 of the Gahirmatha Coast last year). Unfortunately the problem is 'political' and the only solution is meticulous patrolling and enforcement by Navy, Coast Guard and Customs. The turtle excluder device developed to reduce the incidental capture of turtles in the U.S. should be introduced for trials here and the results publicised. The FAO, Bay of Bengal Project would perhaps be interested in doing the initial experiments.

Public Education

The plight of the sea turtles is that we know so little about them yet they are heavily exploited, eggs and adults, throughout most of the world. Children and adult humans who live along the coast (many in fishing villages) can be taught by radio, TV, pamphlets, and posters about how and why sea turtles should be protec-

ted. Poachers always find it difficult to operate where there is a positive public attitude toward wildlife.

Education must extend to the level of the factory and trawler owners who pollute habitat or incidental catch of turtles. India has seen several recent examples of how valuable, effective public opinion can be to species protection.

Non-consumptive utilization of turtles such as tourism (to see them laying eggs) and research can help create more public esteem for sea turtles which have a natural appeal ahead of the other, more toothy or venomous reptiles such as crocodilians and snakes.

Project Tiger being the best example. A good film can easily be made on sea turtles of India and would be a valuable step in heightening public awareness.

MANIPULATION

I. Recovery

Erasing Tracks : Before some measure of protection came to Madras beaches we used to race ahead of the egg poachers and rub out turtle tracks, make false tracks and generally disrupt their work. It was certainly an effective and simple technique to deter human predation and probably helped prevent dogs and jackals from finding nests.

Transplanting Nests : A slightly more elaborate but still simple and effective method of protecting nests from all predators is the careful digging up and transplanting of the nest to a suitable nest hole dug nearby.

Hatchery and Release : One of the most popular conservation techniques is the collection or purchase of eggs for hatching and release. Some of the constraints include :

- (i) the chances of mishandling eggs and delays in getting them to the hatchery.
- (ii) siting and maintaining hatchery so that losses due to heat, dessication, inundation and predation are minimized.

- (iii) temperature related sex determination presents the danger of producing unnaturally biased sex ratios
- (iv) holding the hatchlings for longer than 12 hours after hatching will mean releasing tired hatchlings which may not survive.

In general, following the exact specifications established by the nesting female turtle is our best guide for hatchery site selection, hole size, temperature and humidity of the sand. No amount of lecturing or field manual drawings can substitute for actual observation of a turtle making her nest and laying her eggs. Although it is conjectured by turtle researchers in other countries involved with hatchery projects for over two decades that these measures are valuable exercises that help sea turtle populations, there is as yet little supporting data but considering the 90% egg loss we used to report on the Tamil Nadu Coast the present release of 10's of thousands of hatchlings each season must certainly be helping the recruitment rate.

Translocation of nests to other beaches or even entirely new areas where nesting habitat exists but numbers of turtles are low or absent may be an applicable strategy in some circumstances. Constraints to be considered include costs and the lack of evidence of success in trials in other countries.

Headstarting by Rearing : An elaboration of the hatchery system is captive rearing for a year or more to release 'headstarted' juveniles well past the stage of maximum mortality. This is an expensive and technologically much more complex procedure involving dietary, husbandry and veterinary problems. It is being used mainly to assist the recovery of truly endangered species or populations of sea turtles, in particular the Kemp's or Atlantic ridley. Despite many such programmes this technique is still unproven and must be treated as an experiment.

II. Management

Culling 'Surplus' Adults for Market : As attractive as such a 'simple' method of managing the turtle resource seems, the proposal breaks down because of our inadequate knowledge of the status and biology of the reptiles in question. I was recently

privileged to stand on Gahirmatha Beach in Orissa and watch thousands of ridleys climb ashore in their annual nesting 'arribada' (as it is called in Latin America). And we saw only the females. The Coast Guard sent reports of seeing 'islands' and 'flotillas' of turtles heading north to Orissa during November and December—perhaps a total of 5 lakhs or more! The Educated estimates of ridley turtles captured for market uptill 1982 range from 30,000—90,000. Perhaps someday Calcuttans will enjoy their sea turtle meat again, but first we must study the basic dynamics of this ridley population.

Collection of Doomed Eggs for Market: With the exception of beaches in the Bay Islands and Lakshadweep which are only just being studied, the only beach where nesting density is high enough to talk about a commercial offtake is Gahirmatha. Over 40 million eggs are laid there each season, of which possibly 50% are destroyed by successive waves of nesters coming up onto the same stretch of beach. While we may be reluctant to depart from the trend of total protection it is essential to put wildlife conservation in the correct perspective and look forward to a time when turtles are conserved for careful, sustained usage. No one can help but see the tremendous egg loss which takes place during the annual arribada. While birds in the sanctuary and scavengers such as wild pigs, jackals and hyena benefit from this it appears very likely that some part of this protein source could be used once again for human consumption. Data collection in this direction, if not already being done, will be a very valuable step forward in modern management.

Ranching for Market: Ranching is the commercial rearing of turtles from wild collected eggs or young preferably doomed eggs. It may be an expensive operation which competes with local people for locally caught protein to feed the turtles which is a major constraint. Other arguments against this form of mariculture are: the creation and encouragement of a market for sea turtle products that cannot be filled by the ranches inability to control the market. However, in the specific case of Orissa (from where Calcuttans were consuming perhaps 2 lakhs kg of sea turtles each year) there may be a good argument for a ranching scheme. The basic equation is how much it will cost to raise a ridley to a marketable size (say 15 kg in 3-4 years), and whether at this growing cost

it can be profitably marketed. The answer mostly depends on a very cheap and very abundant protein source to feed the turtles which does not compete with the local human protein needs. From what we know about the ranching of other reptiles which produce more valuable products (crocodile skin) it seems that profitable turtle ranching may not be economically feasible for a local market.

Captive Breeding : So far captive breeding of 2nd generation captive stock has been achieved only at the Cayman Islands Turtle Farm after years of investment and trials. In India the need for captive breeding as a recovery measure has not been demonstrated. The development of the technology would be valuable if it can be done cheaply (in a natural harbour for example), but at this stage the limited resources available for sea turtle conservation in India should be channelled under a single coordinated plan for the entire country. In general, research must support and monitor any of the options pursued ; studies directly relevant to sea turtle conservation can be encouraged through the appropriate academic and technical agencies. Once we know more about the status and biology of these animals which touch our shores for only a few hours each year, we will be able to decide which of our many conservation and management options are the right decisions.

REFERENCE

- KAR, C. S. AND SATISH BHASKAR 1981. Status of sea turtles in the Eastern Indian Ocean. In: K. Bjorndal (Ed.) *Biology and conservation of sea turtles*. Smithsonian Institution Press, Washington, D.C.

DISCUSSION

- P. KANNAN : Could you tell us the kind of problems the Orissa Forest Department officials are facing in preventing poaching of turtles.
- S. K. MISRA : Problems faced by the officials are in handling the cases. Persons who are poaching the turtles in the high seas have to be brought 80 km away through the rivers and creeks. The personnel are released on bail and the vessels are also released on bail. Many of the persons have not appeared in the case also. Further, the problem is the persons involved in poaching are the fishermen from West Bengal and not from Orissa and this becomes an interstate problem. They are the migratory fishermen and it is difficult for the West Bengal Department of Police also to trace the persons involved who are released on bail.

- A. N. KARVE : There is a lot of delay in finalising the cases by the courts. The cases booked in the 1982-83 season have not been decided so far.
- E. G. SILAS : The problem is complex due to migrant fishermen from West Bengal who are involved with the poaching. In January 1984, Forest officials of West Bengal at Contai obstructed one truck carrying sea turtles at Bajkul checkpost and produced the same before the Judicial Magistrate of Contai. The merchants defended that the turtles captured are not covered by the Indian Wildlife (Protection) Act. The Additional Divisional Forest Officer, Midnapur was brought to identify the turtles and then the turtle were released into the sea at Junput. Even the earlier cases pending in the Court at Contai have not yet been decided. There is an urgent need to develop and strengthen the co-ordination and co-operation between the Forest and Fisheries Departments within the States as well as interstate between West Bengal and Orissa. At present the Fisheries Department officials are not at all involved.
- K. SHANMUGANATHAN : Some sort of compounding — on the spot fine — powers can be delegated to the wild life officers.
- R. WHITAKER : Compounding will not solve the problem. The vehicle or trawler involved has to also be confiscated.
- A. N. KARVE : The Central Government or Coast Guard is not at all in the picture. The coastal waters are regulated by the state government legislations. The Coast Guard cannot book cases against the Indian fishing vessels which are coming under the fishing industry. They can prevent the foreign fishing vessels and book cases against them.
- P. KANNAN : Without amending the Act, how about appointing honorary wildlife wardens to look into the problem of poaching?
- S. K. MISRA : Already the Chief Wildlife Warden, Orissa has the powers to appoint honorary wildlife wardens.
- K. SHANMUGANATHAN : In Tamil Nadu also the Chief Wildlife Warden and The Additional Chief Conservator of Forests have the powers to appoint honorary wildlife wardens.
- J. FRAZIER : There is immediate need to preserve the mangrove areas, at Gahirmatha. In this connection the study made by the WWF can be looked into.
- E. G. SILAS : The problem is very crucial at Gahirmatha. There are stumps and remains of mangrove in the intertidal region in the southern sector of the Gahirmatha Beach close to Habalikhati. The vast pile up of sand among mangrove vegetation resulting from the 1976 and 1981 cyclones which had affected the area is still evident with a broad fringe of withered mangrove over a few kilometres stretch.