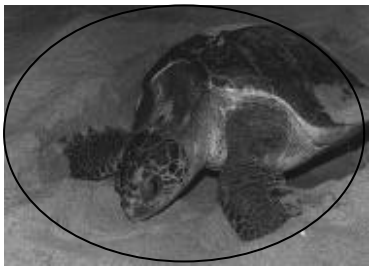

Kachhapa

A newsletter for the Indian ocean on sea turtle conservation and management

GUEST EDITORIAL

Marine Turtles: What about reintroduction ?

ARTICLES

Threats to sea turtles in St. Martin's island, Bangladesh
Estimation of the number of leatherbacks at Godavaya, Sri Lanka
Leatherback nesting in the Andaman & Nicobar Islands

AND

A significant population of Leatherback turtles in the Indian ocean

Issue No. 6
March, 2002

HELP US WITH OUR MAILING LIST

Since this newsletter hopes to serve as a link for coastal and marine conservation, the more people we can reach, the more effective it will be. You can help by passing the newsletter around to people and organizations who are interested, and by helping us build up our mailing list. Please send us names and addresses of individuals, NGOs, research institutions, schools and colleges and anyone else who would be interested in receiving Kachhapa.

CALL FOR ARTICLES

Kachhapa, the newsletter, was initiated to provide a forum for exchange of information on sea turtle biology and conservation, management and education and awareness activities in the Indian subcontinent and neighbouring regions. The newsletter also intends to cover related aspects such as fisheries and marine biology. In the first issue, Kachhapa provided a compilation of organisations working on sea turtles in the subcontinent. From the second issue on, Kachhapa has included articles on the above subjects. Kachhapa articles are now peer reviewed. For the moment, Kachhapa will come out twice a year, sometime at the beginning and sometime at the end We request all our contributors and readers to send us information from their part of the subcontinent or Indian ocean region, including notes, letters and announcements. We also welcome casual notes, anecdotal accounts and snippets of information.

OPINION

In addition to information and articles, we now invite your opinion on subjects related to turtles, their habitats and conservation.

BIBLIOGRAPHY

We plan to publish a complete bibliography of literature on sea turtles in the Indian subcontinent in the near future. Meanwhile, the bibliography will be available at our website. We would welcome any additional references that we have missed and copies of articles, papers or reports that are absent from the bibliography.

ALL MATERIAL SHOULD BE SENT TO:

Kartik Shanker
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Guest Editorial
Marine Turtles: What about reintroduction?

Matthew H. Godfrey[1] & Miguel Pedrono[1,2]
[1]Laboratoire d' Ecologie, Systématique et Evolution
Bâtiment 362, Université Paris XI
91405 Orsay FRANCE
[2]CIRAD-EMVT, Campus International de Baillarguet
34398 Montpellier Cedex 5 FRANCE.

The basic practice of taking turtles out of the wild for short or long periods, and then putting them back in again, either in the original site or in a different site that may or may not have (or have had) turtles there, has been widely discussed and debated as a conservation activity. At least 9 different terms (headstarting, introduction, rehabilitation, reinforcement, reintroduction, relocation, repatriation, restocking, and translocation) have been invoked, each with various subtleties and nuances (for more discussion, see Dodd and Seigel 1991, Reinert 1991; and for the IUCN-endorsed definitions for reintroductions, visit the official website- http://www.iucn.org/themes/ssc/pubs/policy/reinte.htm). Rather than get bogged down by all the details of the terminology, we offer our view on the larger issue of reintroduction (which we use loosely to cover all the different terms mentioned above). But, you may ask yourself, why make this fuss? What does it matter? Introduction and its various nuances have been carefully critiqued and largely discredited as viable conservation and management schemes (Dodd and Seigel 1991, Reinert 1991, McDougal 2000, Meylan and Ehrenfeld 2000, Seigel and Dodd 2000), thus why discuss this topic?

There are several reasons for wanting to reopen the discussion on this topic. First, like most activities related to conservation, be it management, research, or politics, there is no single golden rule. Rather, the specifics of each situation must be evaluated on its own merits (and shortcomings) on a case-by-case basis. So, what may be not so good in one place may be satisfactory in another. Second, in general, the arguments against relocations or introductions usually come from a scientific perspective: one of the most common criticisms is that these projects are experiments only, and therefore should be judged purely in terms of their scientific and experimental qualities (including things such hypotheses-testing, methods of analyses, etc.). While this may be true in some cases, surely there are other cases when releasing turtles is more a conservation activity and less a research experiment, and thus should be judged accordingly. Third, although we concur with Dodd and Seigel (1991) and others that previous reintroduction programs should be duly criticized for their poor planning or lack of overall objectives, we do not accept this as an argument against the possibility of reintroduction as a useful conservation tool, if implemented correctly. We will discuss these three points using examples of sea turtles and also freshwater and terrestrial turtles, as the latter have been subject to more reintroduction efforts.

Conservation is a very complex undertaking, and the success of conservation projects in specific regions or locales is often based on adapting particular protocols or methods that are specific to the situation at hand. Attempts to give universal rules for conservation do not do justice to the variations in geography, climate, social structure, or culture (to name a few) that color the landscape of conservation, and such a simplistic approach can limit the possibilities available for conservation. One example of this in sea turtle conservation is the general prohibition of utilization of turtles (or their parts). The general argument is that sea turtle populations cannot support a harvest, either of eggs or adults. However, there are reasons to reject this simplistic position: 1. The continued existence of apparently sustainable harvesting programs in Costa Rica and Suriname (Campbell 1998, Mohadin, 1999); 2. The amazing rebound exhibited by olive ridley turtles in western Mexico in the last decade or so (Salazar *et al.* 2000), despite being so heavily harvested in the 1960s and 1970s that most agreed this species in Pacific Mexico was on the verge of extirpation (Cliffton *et al.* 1982). Both points suggest that in some situations, harvesting eggs or adults is possible and sustainable. The important point is to look at each case individually, rather than try to make global recommendations. In the case of (re)introduction, there is the example of the Kemp's ridley. This turtle species was subjected to headstarting, relocation of eggs and/or hatchlings to

Padre Island in Texas in an attempt to establish a nesting colony there, and the maintenance of Kemp's ridleys in captivity at the Cayman Turtle Farm (as a safety stock in case of complete collapse of the wild population). There are signs that this species is in the stages of recovery, at least in numbers of nests laid annually on the main nesting sites in Tamaulipas, Mexico (Márquez-M. *et al.* 2001), and there is even some indication of an increase of Kemp's ridley nests in Padre Island, Texas, site of a headstarting/introduction/relocation project (Shaver and Caillouet 1998). Given the complexity of interaction among these various protocols, together with the increased use of turtle excluder devices (TEDs) by shrimping boats in the Gulf of Mexico in the last decade or so, it is difficult to discern exactly what is responsible for most of the success (Pritchard 1997). But the confirmed nesting by some headstarted individuals in Texas shows that indeed *returtling* of sea turtles can produce real results, although whether they should be deemed successful is another question, particularly in terms of cost-benefit analysis.

The case of the reintroduction activities involving Kemp's ridleys has been the subject of many editorials and opinion pieces, and by-and-large the current opinion is that it was a scientific experiment, and should be judged as such (Taubes 1992, Eckert *et al*. 1994). Given that age to maturity is relatively long for these turtles (≥10 years), it is probably still too early to be able to judge the success of this experiment, and even more difficult to disentangle the results due to reintroduction and those due to other conservation activities (Caillouet 1998). But we suggest that if reintroduction activities are to be considered as a conservation tool, they cannot be judged simply in scientific terms. For example, if there is an educational benefit to reintroduction, which may come with releasing headstarted or hatchery-incubated turtles, then success can be judged in terms of increasing awareness of conservation issues, fostering public support for turtle protection, etc. There is also the added benefit that reintroduction activities may play a role in including and empowering local people in conservation efforts, either by stimulating discussions and/or directly participating in specific projects. Many have criticised incubating eggs in hatcheries and then releasing the hatchlings produced as being misguided acts which do nothing towards solving the deeper problems facing turtle populations (Frazer 1992) or worse, these activities are seen as a source of misinformation or false hope involving turtle conservation (Seigel and Dodd 2000). We agree that conservation should strive to face the deeper problems, and also that misinformation only does a greater disservice to the credibility of conservation (Bowen and Karl 1999). However, we both have seen the education impact that release programs can achieve. Although we have both been involved in various release programs in several different countries, we have never seen releases that have been used to misinform the public. Granted, these releases make great photo opportunities and are good subjects for press releases, but that does not make them intuitively negative. On the level of education and raising awareness, these activities are far more motivating than a dry scientific publication (or newsletter editorial!!). Also, it has been our experience that, in the face of clear and balanced information, the public is even more sympathetic to turtle conservation. For instance, explaining that most sea turtle hatchlings being released will never reach adulthood nor contribute to the population only reinforces the idea that turtle populations are sensitive and conservation activities are in need of public support. Therefore, even if a specific example of reintroduction cannot be considered an experimental success, it can also be judged for its non-scientific benefits, not to mention other criteria, such as cost-benefit analyses.

Of course, there are many examples of unsuccessful reintroduction efforts, on biological and conservation levels. Indeed, the historical record of reintroduction reads like a checklist of poorly designed projects with little thought given to recovery objectives. The earliest reintroduced species is probably the Galapagos tortoise (*Chelonoidis nigra ephippium*) released since 1965 on Pinzon Island in the Galapagos (MacFarland *et al.*, 1974). Other early examples include *Geochelone gigantea* in the Seychelles (Stoddart *et al*., 1982), *Gopherus polyphemus* in Florida (Diemer, 1987; Burke, 1989), *Testudo hermanni* in Southern Europe (e.g. Devaux 1990), *Podocnemis expansa* in Brazil (Alho, 1985) and *Aspideretes gangeticus* in India (Basu 1987), although most seem to be considered failures (Dodd and Seigel 1991). However, in recent years, there have been some definite successes for reintroduction projects involving turtles and tortoises. For instance, reintroducing *Geochelone gigantea* in Frégate Island has resulted in a strong local population, with different cohorts of juveniles being found on the island, and several adult individuals are now among the largest in the world

(Hambler, 1994). Excellent results have also been reported in the reintroduction of *Chelonoidis nigra chathamensis* sub-adults in San Cristobal Island, Galapagos (L. Cayot, pers. comm.). The program implemented to save the rarest turtle of the world, *Pseudemydura umbrina*, is another example illustrating the positive outcomes. In this last case, the turtles were subject to captive breeding at the Perth Zoo during which habitat restoration projects prepared the areas where the individuals were to be released from captivity. This resulted in the rapid stabilization and growth of the returtled population, the total size increasing 15 times over 10 years (Kuchling 1997). More recently, a Metapopulation Viability Analysis (MVA) including both wild and captive populations of the ploughshare tortoise (*Geochelone yniphora*) living in Madagascar demonstrated the importance of a reintroduction program in the management of this species. MVA allows exploration in the long term on costs and benefits of reintroduction options and prevents subsequent failure in such programs (Pedrono, 2000).

Thus it is clear that while there have been some failures, there have been also some successes in reintroduction activities. We would also argue that some projects deemed to be failures on a scientific basis were successes in terms of conservation. Indeed, one of the most famous reintroduction projects involving sea turtles was Operation Green Turtle. This project, spearheaded by Archie Carr of the University of Florida, spanned nearly 10 years and 17 different countries in the Caribbean, and involved the relocation and release of more than 130,000 green turtle eggs, hatchlings or yearlings (Eliazar *et al*. 1998). The objective was to re-seed nesting beaches throughout the Caribbean, in order to bolster the depleted regional population. Although few data are available, it has been considered a failure in scientific terms (e.g. Demetropoulos 1989). However, in terms of conservation, specifically with respect to raising awareness and being useful as an education tool, it has been considered a success (Eliazar *et al.* 1998). How should this project be evaluated, then? Was it a success, in terms of its educational benefits, or was it a failure, since there seems to be no evidence of increased numbers of turtles in targeted areas, and moreover there have been suggestions that the releases associated with Operation Green Turtle have mixed the genetic stocks in the Caribbean and possibly in the greater Atlantic (Mrosovsky 1983)?

Clearly, it is necessary to weigh the positive and negative impacts of reintroduction programs, to determine if there is an overall success. Moreover, we heartily agree with other authors (e.g. Behler 1997) that returtling programs should receive carefully planning and consideration beforehand, especially with respect to potential problems such as disease transmission to wild populations (Jacobson 1996). And we also agree with Burke (1991) who said that reintroduction is not the panacea to turtle problems, but is still an option in some cases. We would like to add that turtles and tortoise responses to active management can be more efficient than with other vertebrates (e.g. birds and mammals). Biological characteristics intrinsic to chelonians such as innate behavior, near absence of social interactions, easy access to their food resources, broad habitat requirements, low vulnerability to predation after reaching a critical carapace size, lack of territorial patterns, and low sensibility to stress make them ideal candidates for introduction efforts. Each future case must be evaluated independently, and the potentials for success must be evaluated on more than simply the scientific level. Taken together, reintroduction may be a viable conservation option in some cases.

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Threats to sea turtles in St. Martin's island, Bangladesh

M. Zahirul Islam
Sea Turtle Conservation Network
MarineLife Alliance
House no 15/22, Munshi Bari, South Chartha, Comilla 3500, Bangladesh.
Email: marinelife_al@yahoo.com

Sea turtles come to nest on the beaches of Bangladesh at different spots from Sundarban to St Martin's Island. Several decades back, the nesting population was high in number, but day by day they have declined due to severe exploitation of eggs and illegal killing of adult female turtles by fishing and other activities. Now only a few individuals come to nest on the sandy beaches. Five species of marine turtle are reported to occur in the territorial waters of Bangladesh viz., Olive Ridley (*Lepidochelys olivacea*), Green turtle (*Chelonia mydas*), Hawksbill turtle (*Eretmochelys imbricata*), Loggerhead turtle (*Caretta caretta*) and Leatherback turtle (*Dermochelys coriacea*) (Rashid 1986, 1997, Rashid *et al*. 1999). There are no confirmed records of *C. caretta*, but in April 2001 one Leatherback emerged on the main ridley nesting beach of St. Martin's island. But it is known that both species occur in offshore waters as is documented by the stranding of a few dead turtles. In Bangladesh, marine turtle conservation activity started first with the support of MTSG in 1996 by CARINAM (Centre for Advanced Research in Natural Resources and Management) in St. Martin's island. From the beginning of 2000, National Conservation Strategy (NCS) Implementation Project –1 under MOEF (Ministry of Environment & Forest) has worked for sea turtle conservation and beach protection in St. Martin's island and declared the major nesting beach as protected area (Islam, 2001a). A voluntary organization, MarineLife Alliance started monitoring sea turtles, including tagging, awareness, *in situ* protection, trade inspection since 1997-98 under its STURCNET (Sea Turtle Conservation Network) Program. Previously, the three species known to nest in St. Martin's are *L. olivacea, C. mydas* and *E. imbricata* (Rashid 1997). For several decades, exploitation of nests *in situ* was very high since there was no conservation effort. The gap in the laws governing the conservation and management of wildlife in Bangladesh is the non-inclusion of sea turtles in the protected list of Bangladesh Wildlife preservation Amendment (BWPA) Act, Schedule III, of 1974. Migrating species are still to be explored in the offshore and foraging habitats. Threats from human intervention are getting higher gradually. Strandings of dead turtles from beach surveys suggests that the prevailing conditions in offshore areas is poor for turtles. This paper is based on data on dead turtles washed ashore on St. Martin's island during October 1996 - May 2001.

St. Martin's Island & Sea Turtles:

St. Martin's island is a very small offshore sedimentary and continental island of Bangladesh is located at $20^0$34' - $20^0$38N and $92^0$18' – $92^0$22'E, 10 km south of the southern tip of Teknaf peninsula in Cox's Bazar district. This is the only island in Bangladesh which has coral colonies in the shallows. Large areas of sand dune, some mangrove formations, *Pandanus* vegetation and scattered boulder/dead corals are the major characteristics of this island. The surface area of the island is about 8 kms depending on tidal level (see Map). There are 3 vegetated islands on the south coast of St. Martin's island, locally known as the Cheradia. During the low tides, these are connected with the southern part of St. Martin's island by a narrow sand belt, which has accumulated on top of a rocky intertidal zone. The entire intertidal and subtidal zone is fringed with boulders and the shoreline vegetation is dominated by Screw pine *Pandanus sp., Ipomea pes carpeae, Vitex sp.* etc. The total beach length of St. Martin's island is about 14 kilometers and out of this, a very small stretch about 2 kilometers (14%) is suitable and is visited by nesting turtles. The subtropical monsoon climate that prevails over Bangladesh chiefly controls the weather of the island. During May-August it receives the southwest and northeast monsoon climate which is characteristically warm, humid with up to 1000 mm of rainfall in a single month. In the last century the island was covered by what has been described as a rainforest with an abundance of tropical evergreen species. Currently, the island has a total population of 5000 inhabitants, of whom about 90% are fishermen.

The season starts in July-August every year and lasts up to March-April. From October 1996 to June 2001, about 477 Olive Ridleys and 29 Green turtle nests were recorded. *L. Olivacea, C. mydas*, very rarely *E. imbricata* have been known to nest successfully. *D. coriacea* emergence was recorded only in April 2001 for the first time. The highest nesting was recorded in the 2000-01 season. Turtles generally emerge to nest in between 2000-0200 hours.

Major threats to turtle population

At Bangladesh, several causes have been identified for declining sea turtle populations which includes deterioration and reduction of nesting beaches, high mortality of adults by fishing activity (Fig. 1), predation of nests (Fig. 2) and poaching of eggs. Overall, poaching of eggs is rated as the most serious threat. Indeed not a single nest is safe *in situ* if not properly guarded (Islam 1999, Islam *et al.* 1999, Rashid *et al*. 1999). The number of turtles that nest on the beach was never great in number and no "*arribada*" has yet been recorded on St. Martin's island or any other nesting beach of the country. One cannot rely on previous records since observations were not sufficient before 1996. Nesting intensity may have declined greatly within 15-20 years. Rashid (1986) recorded 35 green turtles nesting in one night on the same beach in St Martin. According to local elders, 10-15 years ago, turtle nesting was very common on most of the beaches. Nests remained unexploited *in situ* due to high nesting frequency and sightings of hatchling emergence were also common. Endless over-exploitation have brought the nesting turtles to near extinction. The traditional uses of marine turtle products by local communities are not significant. Major consumers of the turtle eggs are the ethnic communities of the country and the biggest business zone are the 3 hill tract districts of Khagrachari, Rangamati and Bandarban. Very recently *L. olivacea* eggs were recorded in a tribal market at the district main town at Bandarban. A stuffed Hawksbill was recorded on sale at the main tourist town at Cox's Bazar (Islam, 2001). Law enforcement and media coverage, awareness from the Government of Bangladesh regarding sea turtle conservation is still totally absent here.

Fishing & Threats to Sea Turtles in St. Martin's Island

The main fishing season extends from September to April and the main fishing gears used by the islanders are: Drifting gillnets (Duba Jal), Fixed gillnet (Shil Jal), Gill net (Rocket Jal), Seine net (Tana Jal) etc. Of these, Fixed Gill net is used in the rock beds while the Seine net is used along the coast for catching smaller fish species. The marine fish are mainly caught from the offshore seas as well as from the coral beds. Some fishing methods appear to exert severe impact on other aquatic resources. Seine net has been observed to damage the algal beds on the sandy shore. The juvenile sea turtles, young jellyfish, cuttlefish, squid, octopus and other marine life are also caught in this net. Drift nets usually are used in offshore fishing boats. They are widely used in the major fishing activity of sea fishing. The width of drift nets ranged from 15-60 meter in different areas of Bangladesh. In St. Martin's island, fishermen only use drift nets which are 15-20 meters in width and 100- 150 meters in length. Drift nets are operated from top to bottom in the sea with a chance to trap turtles and other underwater animals during fishing. The mesh size in the drift net of St. Martin is 5-6 inches. According to the fishermen many sea turtles are trapped in this sort of net. If any sea turtle gets entangled, fishermen intentionally kill or cut the flippers and head to save their nets. The situation has improved at least in St. Martin's island thanks to sea turtle conservation awareness programmes in the last several years.

Rocket nets are smaller, about 5 metres wide and about 150 metres long. This has very mesh and has no effect on sea turtles and other non-fishing marine resources. It is operated normally in near-shore areas with the help of small boats.

Fixed gill nets are set under water but remain in touch with the bottom of the sea. The usual length is 80-100 metres in St. Martin's Island. The upper portion remains open and some floats with signal and tags are used to show the sign of submerged nets as caution. Normally, fixed gill nets are set at 16-20 meter depth along the south eastern to western shallows of the main sea turtle nesting ground. The situation was very serious due to fishing by fixed gill net whilst nets remain submerged as traps above the sea floor near the

coast, They are set from 2100-2200 to harvesting time 0400-0500 hours. Therefore, turtles trapped in late hours have a small chance of survival and fisherman can release them, while turtles trapped in first few hours could not survive. This sort of net makes nesting females more vulnerable since these are set nearer the coast along the passage turtles cross to emerge, especially at the main Olive ridley nesting beach, Shil Banyar Gula ($20^0$36.4'N; $92^0$19.5'E; see Map).

Threats due to fishing nets and fishing vessels are severe. Most of the turtles that get entangled in drift net and fixed gill net cannot escape. They die either due to suffocation or fishermen kill them to free their nets. The superstitious fishing community considers the sighting of a turtle or a turtle getting entangled in the fishing nets as bad. Turtles encountered during fishing or on the way are intentionally hit. Local fisherman normally deny responsibility for turtle deaths; they blame fishing trawlers from Moheskhali, Cox's Bazar and Chittagong for the high turtle mortality. Twenty seven turtles of both sexes and sub adults were found dead on the beach of St. Martin's island during the survey of 1996-98 of which about 19 individuals died due to fishing as suspected. More than 51 dead olive ridleys were washed ashore during the 2000-01 season (Fig. 2). The south and southwest offshore zone from the island is deep sea, mainly turtle foraging zone and is also used by large mechanized fishing boats (Islam *et al*. 1999). Dead turtles float for some days and are finally washed ashore on St. Martin's island and on other coasts of the country.

In a study before 1996 conducted by Marine Fisheries Research Institute (MFRI) to investigate the frequency of turtle mortality due to either drowning or entangling in fishing nets, it has been mentioned that turtle deaths were not significant (Rashid, 1997). However, this may have been biased. Concurrently, USA imposed a ban on the import of shrimps from Bangladesh unless certain conditions were met including that fishing vessels use Turtle Excluder Device (TEDs) in trawl nets. The time of fishing and the depth at which the net drags are also important factors for determining the mortality. Furthermore, the fishing area is also important depending on the different feeding habitats of various turtle species. Killings by St. Martin's island fishermen were not negligible and some of them still consider turtles as a bad sign while fishing. Some success has however been achieved; the awareness program since 1996 by CARINAM, NCSIP and MarineLife Alliance has encouraged some traditional fishermen to think of turtles are friendly animals instead of harmful to their fishing activity. Today, after a period, people's attitudes have changed a little, but it is not enough, as most of the entangled turtles, particularly in drift nets and fixed gill nets, are found dead. To overcome these hazards, regulations should be imposed to prevent setting these types of nets in these places.

In January 1999, the main *L. olivacea* nesting beach was affected seriously. No nesting was observed for about 7 nights turtles and finally on 23rd January 1999, one dead turtle was washed ashore and dogs were seen eating eggs from the carcass. Only those turtles washed ashore on island were counted, but huge numbers may float away from the island to other coasts of the country or the nearby Myanmar coasts. This year 2001 St. Martin fishermen reported sightings of numerous dead turtles in the Oceanic Floats Congregation (*Chioon*i-local name), which is several miles long and there are possibilities of several hundreds or even thousands of dead turtles in this oceanic float. It is suspected that, severe impact due to shrimp fishery in the open sea is beyond imagination and we must conduct an inventory to identify the intense threats in offshore habitats. We are hopeful for the future at least of St. Martin's island turtle population since they would have safe beach and foraging habitat as MOEF is currently starting Marine Park Project which is an outcome of NCSIP-1 (National Conservation Strategy Implementation Project-1; MOEF). The project included several future objectives regarding beach and offshore habitat protection for sea turtle conservation although it depends upon how we all cooperate to bring about this precious and significant venture.

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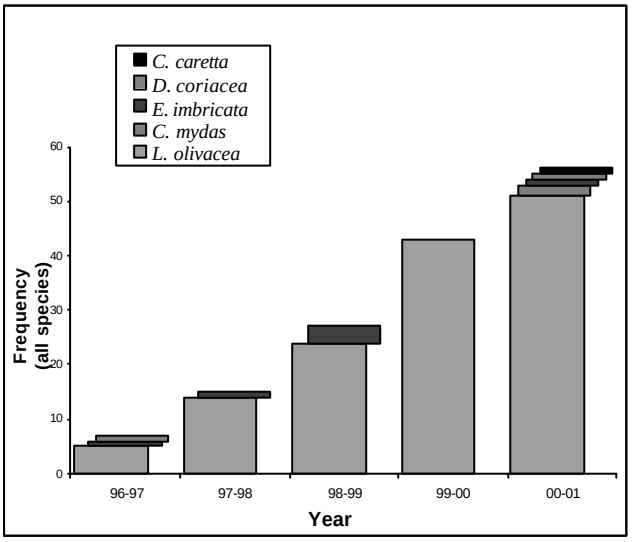


Figure 1: Year wise record of dead sea turtle on St. Martin's island during 1996-2001 due to fishing activity

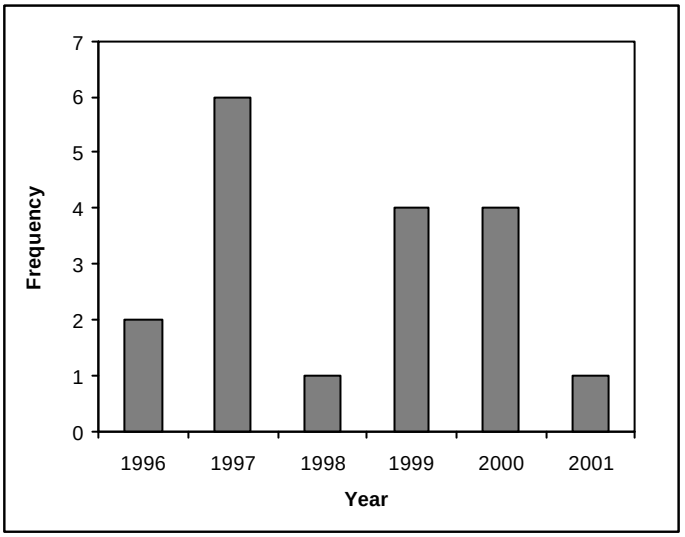
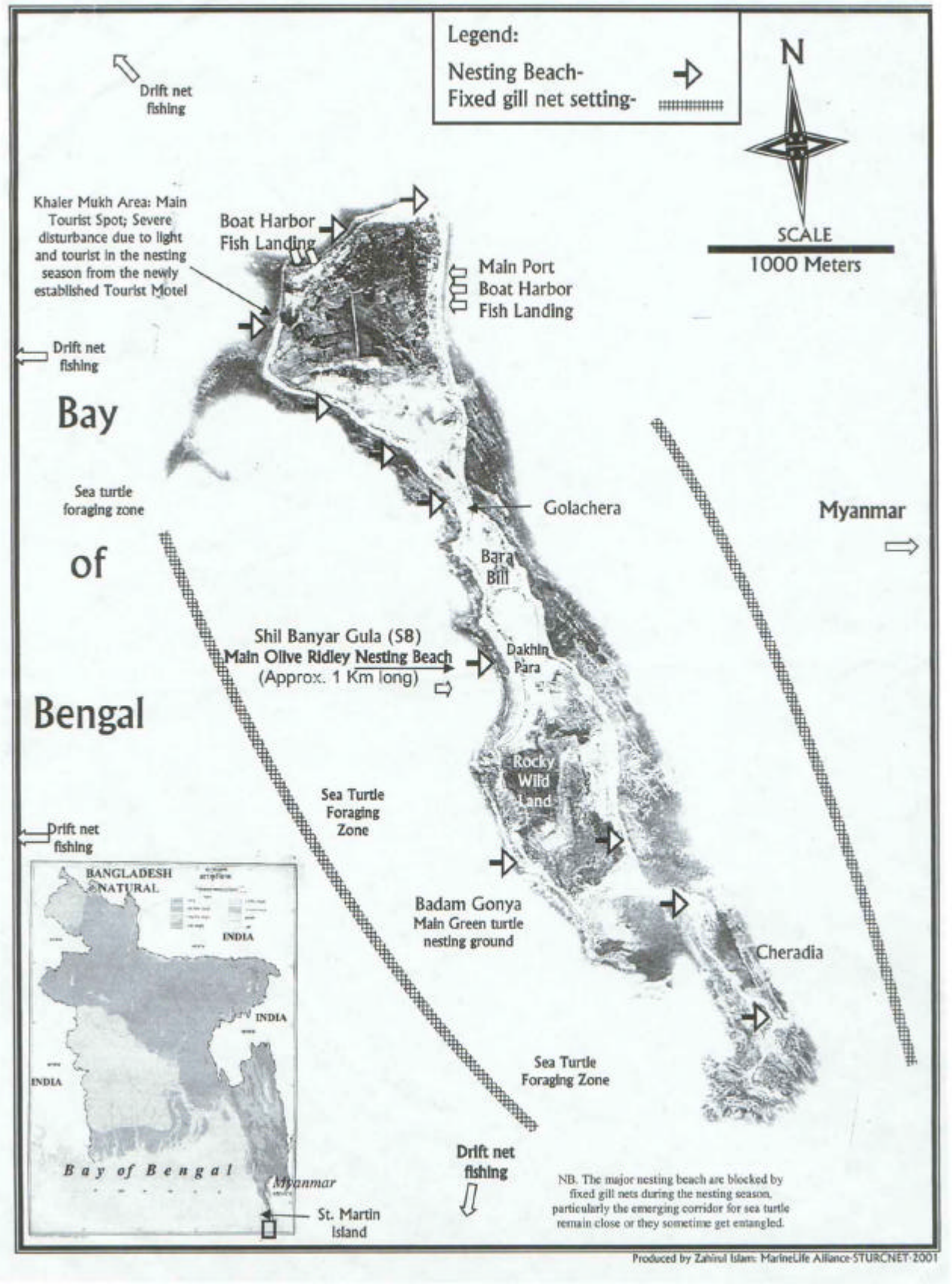


Figure 2: Predation on sea turtle nests on St. Martin's Island by stray dogs during October 1996-June 2001


Legend:
Nesting Beach-
Fixed gill net setting-
N
SCALE
1000 Meters
Drift net fishing
Khaler Mukh Area: Main Tourist Spot; Severe disturbance due to light and tourist in the nesting season from the newly established Tourist Motel
Boat Harbor
Fish Landing
Main Port
Boat Harbor
Fish Landing
Drift net fishing
Bay
of
Bengal
Sea turtle foraging zone
Golachera
Myanmar
Bara Bill
Shil Banyar Gula (S8)
Main Olive Ridley Nesting Beach
(Approx. 1 Km long)
Dakhin Para
Rocky Wild Land
Sea Turtle Foraging Zone
Drift net fishing
Badam Gonya
Main Green turtle nesting ground
Cheradia
Sea Turtle Foraging Zone
Drift net fishing
BANGLADESH
NATURAL
INDIA
INDIA
INDIA
Bay of Bengal
Myanmar
St. Martin Island
NB. The major nesting beach are blocked by fixed gill nets during the nesting season, particularly the emerging corridor for sea turtle remain close or they sometime get entangled.
Produced by Zahirul Islam: MarineLife Alliance-STURCNET-2001

Estimation of the number of leatherback (*Dermochelys coriacea*) nesting at the Godavaya turtle rookery in Southern Sri Lanka during the nesting season in the year 2001

E.M. Lalith Ekanayake*, Thushan Kapurusinghe, M.M.Saman and M.G.C. Premakumara

Turtle Conservation Project (TCP)
73, Hambantota Road, Tangalle, Sri Lanka.
Email: turtle@panlanka.net

Introduction

Sea turtles represent an ancient and distinctive part of the world's biological diversity. Sea turtles are reptiles and basically spend their entire lives in marine or estuarine habitats. They, like most other aquatic reptilians, are only tied to terrestrial habitats for nesting and restricted cases of basking. Physiological, anatomical and behavioural adaptations of sea turtles have evolved largely in response to selection in the aquatic environment. Sea turtles are unevenly distributed throughout the tropical and subtropical seas depending on their food and habitat requirements (Witzell, 1983; Dodd, 1988; Marquez, 1994; Hirth, 1997; Miller 1997). There are seven species of sea turtles living in the world and five of them come ashore to nest in Sri Lanka. On some of these beaches, turtle nesting is seasonal, while on others, nesting can be observed throughout the year with a peak season. The species composition is changing in the various beaches. The Turtle Conservation Project (TCP) surveys revealed that Godavaya in southern Sri Lanka is an important nesting beach for the leatherback turtle compared to the available data about turtle nesting in Sri Lanka (TCP, 1999). Therefore, the objective of this study was to estimate the number of nests of the leatherback turtle during the nesting season in 2001 at Godavaya.

Methodology

This is an unprotected beach and therefore, egg collection occurs every night throughout the nesting season. In the early morning we patrolled the 4 km long beach for the counting tracks. Using our past experience, we have identified the leatherback nesting crawls and also the false crawls. We have counted only the fresh crawls, which was made previous night. All the false crawls and nests were counted on an average of five days per month and, in the peak months about eight days per month. The survey was carried out from the 21st of March 2001 until 30th November 2001. The first leatherback nesting occurred on 16th April and the last nesting was observed on the 30th of August.

Result and Calculation

Number of leatherback nests counted = 70
Number of false crawls counted = 34
Number of surveyed days = 32
Total number of days between the leatherback nesting dates = 153
Average number of leatherback nests per day = 70/32
= **2.18**

Therefore, estimated total number of nests during the survey period = 2.18×153
= **333**

Average number of leatherback false crawls per day = 34/32
= 1.06

Therefore, estimated total number of false crawls during the survey period
= 1.06×153
= **162**

Estimated annual nesting population = 333/4.9
= **68**

Discussion

Surveys on turtle nesting beaches are the most widely used monitoring tool use by turtle conservationists around the world. This is an important component of a comprehensive program to assess and monitor the status of sea turtle populations. These assessments are necessary to evaluate the effects of recovery and conservation activities which are being implemented at all life history stages (Schroeder and Murphy, 1999). Daily

monitoring throughout the nesting season is required for a complete nest count. On the other hand daily monitoring is not always necessary or logistically possible and data from intermittent surveys can be used as an index to total nesting, provided there are baseline data available and provided the survey is appropriately designed to periodically sample throughout the nesting season (Schroeder and Murphy, 1999).

In our survey we have periodically sampled the leatherback nesting throughout the nesting season. According to the result there were 333 leatherback nests recorded during the nesting season in year 2001 on the Godavaya beach. The estimation of population size is important for several reasons. An estimation of population size is critical for science, conservation and management. Many threats to turtle population cannot be evaluated unless we have an estimate of population size (Gerrodette and Taylor, 1999). Leatherback turtles nest on average of **4.9** nests per season ranging from one to seven times depending on the female's reproductive status (Bhaskar, 1993). Therefore, we can estimate that the annual nesting population of leatherback turtles on the Godavaya beach is **68** individuals.* Earlier, there was no literature about the nesting population of leatherback turtles on this beach. The TCP survey in 1999 identified this beach as an important nesting place for the leatherback turtles. Hence this is the first proper survey done about leatherback nesting on this beach. Therefore, we recommend that surveys should continue at least few years to get a good estimate of the leatherback population on this beach.

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***Editors note:** The remigration of leatherback turtles is estimated to be 2.5 years and hence, the total population may be estimate as **170 leatherback turtles**.*

Leatherback nesting in the Andaman & Nicobar Islands

Harry V. Andrews, Shreyas Krishnan & Paridosh Biswas
Andaman and Nicobar Islands Environmental Team/ Centre for Island Ecology, Madras Crocodile Bank Trust, Post Bag- 4, Tamil Nadu- 603 104, South India.

Introduction

The Andaman and Nicobar Islands situated in the Bay of Bengal spans latitude 6° 45' N to 13° 41' N, longitudinally 92° 12' E to 93° 57' E; and consists of over 345 islands, islets and rocky outcrops. The coastline stretch of 1,962 km and the many beaches around small isolated islands provides excellent nesting habitats for four species of marine turtles (Bhaskar, 1979b; Andrews, 2000). The extensive coral reefs, sea grass beds, large bays and mangrove ecosystems around the archipelago provide optimum feeding grounds for marine turtles, and occurence of feeding turtles in these waters has been confirmed (Bhaskar, 1993; Das, 1996). Management plans and conservation efforts by the Andaman & Nicobar Islands Forest Department and the Andaman & Nicobar Islands Environmental Team (ANET) has been carried out to an extent (Bhaskar & Andrews 1993; Andrews *et al*., 2001). Details of historical, references, citations and reports concerning marine turtles and the Andaman and Nicobar Islands from the 18 century has been previously discussed by Bhaskar (1993) and Andrews *et al*. (2001). Current local threats to leatherback in the Andaman and Nicobar Islands has been discussed by several authors (Bhaskar, 1993; Sivasunder, 1996; Andrews, 2001; Andrews, *et al*., 2001) and Spotila, *et al*., (1996) have discussed the global population decline of this species.

Up to the mid 1970's, only three species were reported for the islands and a fourth, *Caretta caretta*, which do not seem to occur around this archipelago. However indirect evidences from ongoing surveys indicate that there may be a possibility of a few loggerheads nesting on some small isolated islands in the Nicobar group (Chandi, *pers. comm*.) and this can only be confirmed with continued and more extensive surveys. In the late 1970's, Bhaskar, (1979 a; 1979 b; 1980), first reported leatherback (*Dermochelys coriacea*) nesting in the Andaman and Nicobar Islands. Status survey and studies since then, for both island groups, have recorded the best leatherback nesting beaches for India (Bhaskar, 1993; Andrews *et al*., 2001). Currently leatherbacks nest only in Sri Lanka and Andaman and Nicobar Islands in the southern Indian Ocean region, although there are records up to late 1960's of this species nesting on the western and eastern coasts of mainland India. Previously, the status of leatherbacks in the Andaman and Nicobar Islands have been under estimated, (Kar & Bhaskar, 1982; Bhaskar, 1993; Spotila, *et al*., 1996; Andrews, 2001). This was mainly due to data deficiency, because of the limited surveys and field studies, logistics, extent of the islands and the number of nesting beaches.

Methodology followed was the same as previously described (Fontaine *et al*., 1987; Parmenter, 1993; Bhaskar, 1993; Dutton & McDonald, 1994; McDonald & Dutton, 1996; Andrews *et al*., 2001).

Nesting Beaches

Sternberg (1981) listed 64 nesting sites worldwide including Andaman and Nicobars as two sites. Currently, 12 nesting beaches are known for the Andaman and Little Andaman Islands, of which nesting has ceased on two beaches on the east coast of North Andaman Island, one along the north east of Middle Andaman and on North Cinque Island, south east of South Andaman Island. On the west coast of Little Andaman Island, nesting on four beaches has been confirmed; high intensity nesting takes place at South Bay and West Bay beaches and sporadic nesting on two other beaches on the north western side (Bhaskar, 1993; Sivasundar, 1996; Andrews, 2000). Little Andaman is currently the only island in the Andaman group where high intensity nesting takes place. In the Nicobar group of islands, 17 nesting beaches have been confirmed, five along the west coast and five on the east coast of Great Nicobar Island. Three other beaches on the east coast of Great Nicobar were destroyed due to sand mining for construction. Little Nicobar Island has five nesting beaches on the western shores, and the other nesting beaches are in the Middle Nicobar group on the west coast of Teressa Island and West Bay of Katchal Island.

Most of the leatherback rookeries in the Nicobars were found only in 1979 and then 1990, two beaches for the Andamans in 1997, and three additional nesting beaches on the east coast of Great Nicobar Island during 2001 (Bhaskar, 1980, 1993; Tiwari, 1992; Andrews, 2000; Andrews, *et al*., 2001). Recent surveys also indicate that occasional nesting occurs on some of the other Nicobar Islands, where they were previously not known to nest (Chandi, *pers. comm*.). Currently there are a total of 25 leatherback nesting beaches in the Andaman and Nicobar Islands, not including the four beaches in the Andamans and three beaches in Great Nicobar Island where nesting has ceased. Most leatherback nesting beaches in the Nicobars and in Little Andaman Island occur on the west coast, whereas there are no leatherback nesting beaches on the west coast of the Andaman Islands and nesting occurs only on the eastern coast (Bhaskar, 1993; Andrews *et al*., 2001).

Nesting estimates

The nesting population of leatherbacks for the Andaman and Nicobar Islands has been discussed to by Bhaskar (1993) and Andrews (2000). However realistic figures only emerged in 2001 after intensive surveys and tagging.

During the 2000-01 season, 163 individuals laid a total of 462 nests at Galathea beach on the south east coast of Great Nicobar island. Intensive surveys and nest counts during the same season along the west coast of Great Nicobar Island confirmed that nesting intensity is much higher than previously estimated. 1228 nests were counted in two locations on the west coast (on the beaches north and south of Alexandria and Dagmar rivers), during the tail end of the nesting season during March and April 2001. During the 2000- 2001 the last six nests were laid on 7th July 2001 and there was no nesting during the months of August and September. Nesting commenced again on 10th October 2001 at the Galathea beach. Between October 2001 and 15th March 2002, 130 turtles accounted for 221 nests. The number of nests may have declined at Galathea due to the erosion of more than half the beach during heavy rains during May and November, 2001.

Tagging

As a part of the tagging program, leatherback turtles were injected with Passive Integrated Transponders (PIT) at the Galathea beach from November, 2000. During the 2000-01 season, 146 individuals were injected with PIT tags. Based on data from turtles that renested on Galathea beach, it was estimated that leatherbacks (n = 82) nested 3.96 times on an average during the 2000- 2001 season.; reproductive effort, renesting by individuals and remigration has been discussed by Andrews, *et al*. (2001).

During the 2001-02 season, 481 leatherback were encountered and 152 were tagged with PIT tags (also with monel metal tags as a part of the Turtle Genetics Project of the Wildlife Institute of India, Dehradun); 57 individuals nested more than once and one leatherback that was tagged during the 2000- 2001 season remigrated and nested on the same beach

Discussion

Based on nest counts and tagging studies, the total nesting population for the 2000- 2001 season on Great Nicobar Island was estimated as 483 individuals, excluding 10 others estimated to have nested on other small beaches; estimates for the Andamans, including Little Andaman Island for the same season was 100 females (Andrews *et al*., 2001). Further conservative estimates are of 25 individuals for Katchal, 25 for Teressa and 100 for Little Nicobar Islands; these estimates are derived from survey findings of Tiwari (1991) and from recent ongoing surveys. Hence, it would appear that 400-500 leatherback turtles nest on Great Nicobar island alone each year.

Continued monitoring and surveys of leatherback in the islands can definitely, in the next two to three years, result in the understanding of the status of the actual nesting populations, determine whether the two island groups support different populations, remigration patterns, yearly nesting trends and intensity on different beaches. Management and conservation measures need to be implemented more vigorously in this region.

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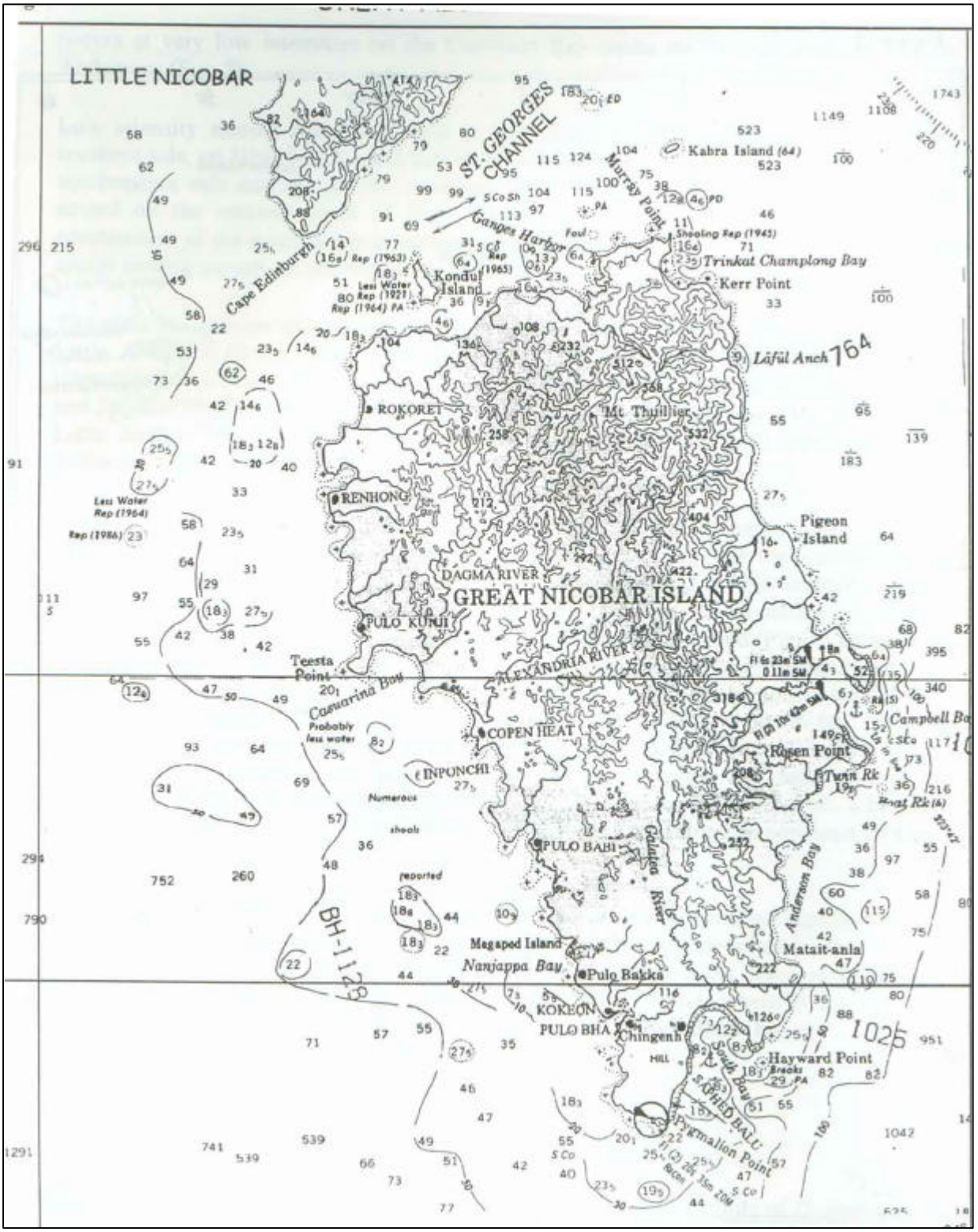
LITTLE NICOBAR
ST. GEORGES CHANNEL
Kabra Island (64)
Murray Point
Ganges Harbor
Trinkat Champlong Bay
Kerr Point
Cape Edinburgh
Kondul Island
Laful Anch
ROKORET
Mt Thuillier
RENHONG
Pigeon Island
DAGMA RIVER
GREAT NICOBAR ISLAND
PULO KUNJI
Teesta Point
Casuarina Bay
ALEXANDRIA RIVER
COPEN HEAT
INPUNCHI
Rosen Point
Twin Rk
PULO BABI
Galatea River
Anderson Bay
Megapod Island
Nanjappa Bay
Pulo Bakka
Matait-anla
KOKEON
PULO BHA
Chingenh
Hayward Point
SADHED BALU
Pygmalion Point
BH-11
Less Water Rep (1964)
Rep (1966)
Probably less water
Numerous shoals reported
Shoaling Rep (1945)
Foul
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A significant population of Leatherback turtles in the Indian ocean

Harry Andrews[1] & Kartik Shanker[2] &
1- Andaman and Nicobar Islands Environmental Team/ Centre for Island Ecology, Madras Crocodile Bank Trust, Post Bag- 4, Tamil Nadu- 603 104, South India.
2- Wildlife Institute of India, PO Box 18, Chandrabani, Dehradun 248001. India.

The global decline of leatherbacks has received much attention in recent times, including predictions of extinction in the near future (Spotila *et al*. 2000). Spotila *et al.* (1996) dismiss the population of leatherbacks in the Indian ocean as minor and also state that they may be under the gravest threat along with Pacific populations. We evaluated the status of marine turtles in the Andaman and Nicobar islands in the context of the Indian ocean, using data from recent surveys (Andrews *et al.*, 2001).

These surveys indicate that past estimates of nesting from the Indian ocean, particularly the Andaman and Nicobar islands, may have underestimated populations. In fact, surveys conducted 10 years apart at Galathea, Great Nicobar do not indicate a decline in the population (Tiwari, 1991; Bhaskar, 1993, Andrews *et al*, 2001).

During 2000-01, a total of 1690 nests were counted on Great Nicobar island (Andrews *et al.* 2001) Dividing by 5 (average annual clutch frequency) and multiplying by 2.5 (average remigration interval) yields a population estimate of 845 adult females for Great Nicobar island. Similarly, we estimate a minimum of 82 adult females for Little Nicobar island (Bhaskar, 1993 counted 165 nests on the southwestern coast). These are very conservative estimates, since Bhaskar (1993) did not cover all leatherback nesting beaches in Little Nicobar and Andrews *et al*. (2001) only surveyed the west coast of Great Nicobar towards the end of the season. Andrews *et al.* (2001) estimate another 150 individuals for the Andaman islands and other islands in the Nicobar group.

It would therefore appear that the population of adult female leatherbacks using the Andaman & Nicobars islands exceeds a 1000 individuals. Spotila *et al*. (1996) list just three other colonies in the world with more than 1000 individuals. Hence this island group, Great Nicobar Island in particular, should be considered one of the major colonies for leatherbacks in the world. These rookeries along with those in Sri Lanka, also increase the significance of the Indian ocean region for leatherback turtles.

Apart from egg predation by feral dogs and pigs (and occasional predation on adults by saltwater crocodiles), these populations currently seem to be in little danger of precipitous declines. We therefore find no evidence to support the claims of Spotila *et al.* (1996) with regard to leatherback turtles in the Indian ocean. The large Nicobar populations and moderate Andaman and Sri Lankan populations should certainly be carefully monitored, since an increase in developmental activities and commercial fishing could well cause sudden declines in these populations.

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Olive ridley mortality in Gill nets in Orissa

Belinda Wright* & Biswajit Mohanty#

** Wildlife Protection Society of India, Thapar House, 124, Janpath, New Delhi 110001*
.# Wildlife Society of Orissa, TULEC Building, Link Road, Cuttack 753001.
Email: Biswajit_m@vsnl.com

The photograph below is the most damning evidence yet of gill netting along the Orissa coast. The multi-filament net, with 205 dead turtles attached, was washed ashore on the afternoon of February 17, 2002 at the Gundalba beach on the Orissa coast. The turtles must have died about 7 or 8 days earlier and the net cut loose when the boat crew found it full of turtles. When members of 'Operation Kachhapa' reached the site on February 18th, the stench of the 205 rotting turtle carcasses was nearly unbearable.

Over the past 2 ½ months, over 10,000 dead olive ridley sea turtles have been washed ashore on the coast of Orissa. Turtle deaths within the Gahirmatha Marine Sanctuary are much lower this year, due to diligent patrolling within the Sanctuary. However, the slaughter outside the Sanctuary's boundaries has been appalling. This is entirely due to the lack of patrolling outside the Sanctuary and the fact that the law requiring the use of TEDs (which was enacted in December 1997) is still not being enforced.

WPSI's sea turtle conservation project, 'Operation Kachhapa', has provided two sea-going patrol boats. One is operating in the southern part of the Marine Sanctuary, while the other has been patrolling from the mouth of the Devi River. Eight-four trawlers and gill netters have been seized since December 2001. However, despite the best efforts of the Forest Department, the Coast Guard and this turtle conservation programme, the turtle slaughter continues. More than 3,000 gill netters and trawlers continue to fish ½ to 2 km from the shore - outside the Marine Sanctuary but within the prohibited zone - every day, in direct contravention of the law.

The Orissa State government has consistently failed to protect sea turtles due to the powerful trawler lobby. It was recently discovered that the Orissa Fisheries Department has issued nearly 6,000 mechanised fishing licenses (5,000 licenses to gill netters, and 900 to trawlers), which is way above the quota of 1,000 licenses that was set by the State Government in 1984 in a notification under the Orissa Marine Fisheries Act.

A staggering 75,000 sea turtles are known to have been slaughtered off the Orissa coast over the last six years.

Where do all the hatchlings go ?

Kartik Shanker
Wildlife Institute of India
PO Box 18, Chandrabani, Dehradun 248001. India.
Email: kartik@wii.gov.in

Gahirmatha, one of the three major rookeries in Orissa on the east coast of India, is considered to be one of the largest nesting sites for olive ridleys in the world. However, the population in Orissa has been under severe threat with over 75,000 turtles counted dead along the Orissa coast, with much of the mortality attributed to fishery related causes. While the turtles on this coast face several additional threats, one in particular has not so far been documented or assessed.

Gahirmatha, located near Dhamra (21°N & 87°E) is the northern most of the mass nesting sites in Orissa, and is part of the Bhitarkanika Wildlife sanctuary, at the mouth of the river Maipura. Mass nesting was first reported by Bustard in 1974, and records suggest arribadas in the range of 100 – 500,000 nesting turtles. The current nesting beaches are islands which are fragments of a 10 km spit which was a part of the mainland till 1989. In 1989, a cyclonic storm cut off a 5 km spit from the mainland and nesting has occurred on this spit thereafter. Since 1996, this island, known as Nasi, has changed drastically from year to year. In 1997, it became fragmented into two islands, 1.1 km and 2.8 km long and a few hundred metres wide. During the supercyclone in October, 1999, the islands became narrower and further fragmented (Pandav, 2000).

Since 1992, all arribadas and most of the nesting at Gahirmatha have occurred on these island fragments. One side of the fragment faces the sea while the other faces the river mouth. Given the distance of the fragments from the mainland (and therefore no visible silhouettes), and the narrowness of the fragments (therefore no dunes or discernable slope), there appear to be no light cues to enable hatchlings to find seaward direction. During emergence in May, 1999 (following the arribada in March), observations on the islands indicated that hatchlings do head in the direction of the river. It is not unreasonable to hypothesise then that some proportion of the hatchlings do end up in the river mouth. Even assuming that this proportion is less than 50 %, this must be considered an additional source of hatchling mortality

The observation that no light cues are available may be erroneous, and hatchlings might well use other cues for sea-finding, but we should consider this issue important enough to merit an investigation. Unfortunately, the fragmentation of the islands has made them relatively unapproachable during the period when emergence occurs and this problem has not been investigated so far. While this may not be the most pressing problem that turtles face in Orissa, it is one that needs to be recognised by both turtle biologists and conservationists as they seek long term strategies for the conservation and management of ridley populations in Orissa.

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NEWS & REPORTS

Effluents from Oswal Fertilisers threatens olive ridley sea turtles on the Orissa coast

The Orissa sea coast is the largest breeding and nesting site for olive ridley sea turtles in the world. However, this unique natural heritage is under serious threat. Thousands of sea turtles are killed every year by illegal mechanised trawling. The latest threat to the long term survival of the turtle population is the continued discharge of effluents from the Oswal phosphate fertiliser factory located at Paradeep .

This industrial unit which commenced production in January, 2000 has caused environmental disasters right from its inception. More than half a dozen accidents have occurred so far which has injured thousands of people. The Paradeep Port Trust has also filed a police complaint against the unit. It is observed that the industrial unit has scant regard for the pollution control laws and the State Pollution Control Board has been unable to control the release of harmful effluents. It routinely discharges the following harmful effluents into the adjacent Mahanadi river system:

a) Phosphogypsum which contains radium-226 which is a radioactive substance. This releases a harmful gas called radon.
b) Fluorine which causes fluorosis and contaminates the ground water. Since the process produces fluorine as a by-product and the unit does not recover this, all such fluorine is released into the surrounding river and creek waters. To hoodwink the Pollution Control Board, the unit has a fluorine recovery unit which is actually not run since there is no production of hydrofluorosilic acid which is obtained when fluorine is recovered from the process.
c) Free sulphuric acid which is extremely harmful for all live organisms.
d) Sulphur dust which is also a poisonous chemical.

Phosphogypsum has been listed as a hazardous waste under category 16 of the Hazardous Waste (Management and Handling) Rules 1989 framed by the Government of India. Phosphogypsum contains radium-226, which decays to radon gas. The World Health Organization (WHO) as well as the US Environmental Protection Agency (EPA) have classified radon as a known human carcinogen.

A recent survey by Operation Kachhapa on 5th January has revealed the serious nature of the polluting activity of the fertiliser unit which has affected the local marine eco-system and can have a long term effect on the survival of olive ridley sea turtles on the Orissa coast. The waters of the Atharabanki creek were greyish white in colour due to the continued discharge of phosphogypsum. The mangrove forests on the banks of the Atharabanki creek carried a white deposit on the leaves which will ultimately lead to the death of the plants. Mangroves are the breeding areas for shrimps, crabs and fish which migrate inland.

Fishermen report the formation of a thick crust of gypsum at the Mahanadi river mouth. Trapped under this crust is radioactive radium- 226 which releases radon gas a known carcinogenic. The team could not find any evidence of living fish, shrimps or crabs on the Atharabanki creek downstream of the Oswal factory. Fish catch of nearly 10,000 country fishermen who depend upon the Mahanadi river system including has been badly affected due to this pollution. The state fisheries department has drawn the attention of the government to the falling fish catch near the Mahanadi mouth due to pollution by Oswal fertilisers.

It is feared that the food chain of the coastal marine ecosystem of the Orissa coast is being affected by this continued discharge of dangerous effluents into the Mahanadi river system. Strong ocean currents at the mouth of the river easily carry these pollutants both up and down the coast including the vital eco - sensitive areas and sea turtle mass nesting sites of Gahirmatha Marine Sanctuary and the Devi river mouth. There is a drastic reduction in the quantity of micro- organisms and juveniles of crabs, shrimps, jellyfish and other fish. Unless immediate steps are taken, Orissa's greatest natural heritage, the olive ridley sea turtles may fail to return in future years.

Source: Biswajit Mohanty, Operation Kachhapa Wildlife Society of Orissa,Cuttack 753001.

National Workshop on Education and Awareness Strategy for Sea Turtle Conservation

A national workshop on Education and Awareness Strategy was conducted by Centre for Environment Education, Ahmedabad. The workshop was held from August 16 – 18, 2001 at CEE, Ahmedabad. The workshop was funded by the GOI – UNDP sea turtle project. A summary report has been produced and CEE envisages to bring out a set of posters thematically on turtle conservation.
Source: E.K. Nareshwar, Centre for Environment Education, Ahmedabad. India.

TED workshop in Kakinada, Andhra Pradesh

The State Institute of Fisheries Technology, Kakinada, conducted a 2 day workshop on the Operation of TED at Kakinada for the fishermen and Fisheries Officials on 24th and 25th of January 2002. The workshop was conducted with the financial assistance of the WII, Dehradun, as a part of the GOI – UNDP Sea Turtle Project. As a follow-up measure in sea turtle conservation, a TED demonstration cum information center was inaugurated during the workshop. This institute has been actively involved in the conservation of sea turtles by conducting awareness programs in fisherman villages throughout the state of Andhra Pradesh. The Government of Andhra Pradesh Department of Fisheries has, in September 2001, issued an amendment in the A.P.Marine Fisheries Regulation Act by making the TED compulsory for shrimp trawlers , without which they are liable for a fine of Rs. 2500/- and confiscation of the catch.
Source: M.A.Yakub Basha & O. Bhavanisankar State Institute of Fisheries Technology, Kakinada. India.

TED workshop in Orissa

A TED awareness and demonstration workshop was conducted by Project Swarajya on February 9 –12, 2002 at Paradip, Orissa. The workshop was attended by trawl operators and owners and technical agencies involved with Fisheries in Orissa.
Source: Chitta Ranjan Behera, Project Swarajya, Orissa. India.

Workshop on marine turtles in Lakhsadweep

The Wildlife Institute of India conducted a detailed survey of sea turtles in the Lakshadweep islands during July 2002 to February 2002. To disseminate the information gatheried and to develop a turtle conservation action plan in a participatory manner, the Wildlife Institute of India organised a workshop on "Sea Turtle Conservation and Management in Lakshadweep" at Kavaratti, Lakshadweep on February 9, 2002 in collaboration with the Department of Environment & Forests, Administration of the Union Territory of Lakshadweep. The one day workshop was attended by 48 participants from different governmental agencies and representatives from the NGOs of Lakshadweep. The workshop included sessions on the current situation and problems of sea turtles, involvement and action by other organisations in sea turtle conservation and assessment of conservation needs and action plan for Lakshadweep
Source: Basudev Tripathy, Wildlife Institute of India, Dehradun. India.

Turtle Protection at Muthiyam beach, Kerala

The Kerala Forest Department has established a hatchery for the protection of olive ridley nests in Muthiyam beach, Malapuram District, Kerala. The Society for Prevention of Cruelty to Animals (SPCA), Malapuram and local Panchayat are also helping in the program, to educate the public with regard to turtle conservation. The main threats to marine turtles on this beach is egg depredation by jackals and feral animals. In 1999-2000, 2500 hatchlings were released, and in 2000-01, 2100 hatchlings were released.
Source: Vinod Kumar Damodar, Hon, Welfare Officer, Animal Welfare Board of India, Calicut

Conservation of marine turtles, Vizhinjam, Kerala

Central Marine Fisheries Research Institute (CMFRI), Vizhinjam, has been carrying out a study on marine turtles in Vizhinjam and nearby areas of Trivandrum from 1996. The study has surveyed nesting on the Trivandrum coast and accidental catch of marine turtles in different gears. Four species of turtle have been reported, including Olive ridleys, Hawksbill turtles, Green turtles and Leatherback turtles.
Source: Dr. S. Krishna Pillai, Principal Scientist, Central Marine Fisheries Research Institute (CMFRI), Vizhinjam, Kerala. India.

U.S. says environment wins in WTO shrimp ruling

GENEVA — The World Trade Organization upheld a U.S. ban on shrimp imports from Malaysia Monday, which Washington hailed as a victory for the environment. The WTO's Appellate Body turned down a Malaysian appeal in the latest stage of the long-running case.

The judges' report "confirms that our sea turtle conservation law is consistent with WTO rules," the office of the U.S. Trade Representative in Washington said in a statement.

The law bars the import of shrimp caught by vessels that do not use turtle-excluder devices, which prevent sea turtles from being caught in shrimp nets and dying. Sea turtles are among the world's most endangered species.

Antiglobalization groups argue that the WTO rules favor business and trade over all other considerations and force member countries to ignore global agreements on the environment.

Activist groups mainly based in Europe and the United States have focused on what has become known as the shrimp-turtle dispute to accuse the 142-member trade body of riding roughshod over environmental concerns.

But the U.S. statement said Monday's ruling showed the WTO "recognizes the legitimate environmental concerns of its members."

FOUR ASIAN COUNTRIES COMPLAINED

The dispute dates back to 1996, when Malaysia, India, Pakistan, and Thailand complained to the WTO about an earlier version of the U.S. law. In 1998, a WTO panel said a blanket U.S. ban on shrimp caught by vessels not equipped with turtle-excluder devices was in breach of the organization's rules.

But the United States later said it had adapted the ban to conform with the ruling, which said that WTO countries had to ensure that any environmental protection measures they took were applied equally to all trading partners.

U.S. officials also offered to help the four Asian countries — who argued the measures were disguised protectionism — in designing, installing, and operating turtle-excluder devices, obligatory for U.S. fishers, on their own shrimping vessels.

Washington has also been trying to win agreement with Indian Ocean–region governments to launch negotiations on an agreement for protecting sea turtles.

Last year, Malaysia returned on its own with a new complaint that the United States had not come fully into line with the original ruling. That argument was rejected by the three members of the original panel, and Malaysia immediately appealed.

There was no immediate comment on the outcome from Malaysia, which like many developing countries, is resisting efforts by the European Union to negotiate a change in WTO rules to provide a link to global environmental accords.

The United States itself is lukewarm on the EU project, saying it feels current rules are adequate to ensure countries can implement their own environmental standards in the trade area without breaking WTO agreements.
Robert Evans, Reuters, October, 2001.

Saltwater crocodiles develop a taste for Leatherbacks

Leatherback turtles nest at Galathea, on Great Nicobar island, between November and May. In November, 2001, a nesting leatherback was killed by a saltwater crocodile, when it came ashore to nest. The turtle was killed within 50 metres of the river. The crocodile ate only the head of the turtle. In December, a second leatherback was killed by a 'salty'. A third leatherback was attacked by a crocodile, which bit off part of its front flipper, before it was chased away by workers of the Forest Department.
Source: Saw Aghue and Saw Glen, Great Nicobar Island

Marine Turtle Newsletter

ONLINE - The *Marine Turtle Newsletter* and *Noticiero de Tortugas Marinas* are both available at the MTN web site <http://www.seaturtle.org/mtn> and <http://www.seaturtle.org/ntm>

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ANNOUNCEMENT

The Proceedings of the National Workshop for the Development of a National Sea Turtle Conservation Action Plan held at Bhubaneshwar in April, 2001 is now available from Wildlife Institute of India, PO Box 18, Chandrabani, Dehradun 248001. India. (Email: wii@wii.gov.in)

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Wildlife Protection Society of India
E-71 Greater Kailash Part I
New Delhi 110048, India.
Email: wpsi@vsnl.com

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For more information, contact:
Operation Kachhapa

Wildlife Protection Society of India (WPSI),
Thapar House, 124 Janpath, New Delhi 110048
Phone: *011 6213864/6238710* ***Fax:*** *011 6464918*
Email: *kachhapa@vsnl.com*

Cover Photograph: Leatherback turtle, Galathea beach, Great Nicobar (Kartik Shanker)

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