Marine Turtle Newsletter

Issue Number 117 *July 2007*

Logo for the Twenty-Eighth Symposium on Sea Turtle Biology and Conservation (pp. 14-16).

IN THIS ISSUE:

ISSN 0839-7708

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Marine Turtles in Mozambique: Towards an Effective Conservation and Management Program

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The Mozambican coast hosts five species of marine turtle including the green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata*) and leatherback turtles (*Dermochelys coriacea*) (Figure 1). These species are listed as either endangered or critically endangered by the IUCN-World Conservation Union and are listed on Appendix I of the Convention on Trade in Endangered Species, to which Mozambique has been a signatory since 1981 (Gove *et al*. 2001). In addition, all turtle species are protected under national legislation so that the killing of marine turtles and possession of their eggs is an offence under a Forest and Wildlife Regulation (Decree 12/2002 of 6 June 2002). This regulation prescribes a fine of MT 25,000 (approximately US$ 1,000 in April 2007) for the illegal hunting of marine turtles. Despite legislative protection, marine turtle populations in Mozambique are under increasing pressure from the human population. The close proximity of coastal towns and villages to marine turtle habitats and burgeoning tourist development present threats to turtles and their habitats on shore and at sea (Gove & Magane 1996). Anthropogenic threats include loss and degradation of nesting and foraging habitats, hunting for meat and carapaces for the manufacture of "tortoiseshell," collection of eggs, as well as incidental capture in various fisheries (Costa & Motta, unpublished data; Louro *et al*., 2006).

The first studies on marine turtles in Mozambique were published almost four decades ago (Hughes 1971, Tinley 1971). Over 20 years passed before marine turtles were the subject of further studies by Gove & Magane (1996), Gove *et al*. (2001) and Magane & João (2003), and significant gaps in our knowledge still remain. In an attempt to fill in these gaps, marine turtle research and conservation work is currently being undertaken in Maputo, Gaza, Inhambane, Nampula and Cabo Delgado. The Mozambique Marine Turtle Working Group (MMTWG) was created in April 2004 and began the first phase of a nationally coordinated turtle monitoring and tagging programme. The MMTWG is now coordinating six tagging and nest monitoring projects along the Mozambican coast and collects and processes data sheets from all these sites. Project sites include the Maputo Special Reserve, Inhaca Island, Macaneta, São Sebastião Sanctuary, Bazaruto Archipelago National Park and the Primeiras and Segundas Archipelago (Figure 1), all previously identified as nationally important marine turtle rookeries (Louro *et al*. 2006). Tagging of nesting marine turtles and monitoring of nests and subsequent hatchling emergences take place during different months of the year along the Mozambique coast, depending on the species. The titanium flipper tags used in this program carry the MO code and are marked for return to: Department of Biology. P.O. Box 257, Maputo Mozambique. More recently the MMTWG has begun to support the ongoing efforts of private tourist operators, local NGOs and the Universidade Eduardo Mondlane (UEM) and their already established turtle tagging programs.

Overview of marine turtle distribution, conservation and monitoring in Mozambique: A variety of habitat characterizes Mozambique's coastline, including delta estuaries, sandy beaches, rocky shores, mangroves, islands and coral reefs. The coast can be divided in three sections, each with distinct, basic characteristics (Figure 1). The northern section of the coast extends for 770 km from the Rovuma River in the north to Pebane in the south (17º20'S). Numerous small islands with coralline habitat extend from the Quirimbas Archipelago to the Primeiras and Segundas Islands (Massinga & Hatton 1996; Schleyer et al. 1999). The most common nesting species in this section is the green turtle, but hawksbill, loggerhead and olive ridley turtles are also known to nest here (Figure 2). Nesting activity peaks from August to October in the Primeiras and Segundas Islands. Meanwhile, in the Quirimbas Archipelago, particularly in Quirimbas National Park, mating turtles have been observed in August and September and nesting takes place from January to April with the peak occurring in March (Costa 2007).

The MMTWG project in the Primeiras and Segundas Islands began in July 2005. The project aims to protect turtles and their nests, tag nesting females, demarcate turtle nesting sites, and

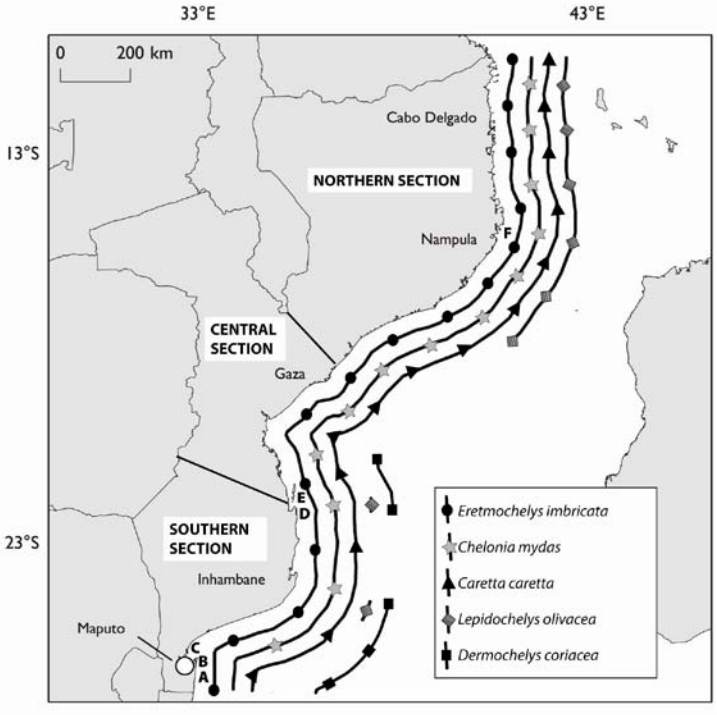

Figure 1. Presence of turtle species across the three coastal regions and the six MMTWG research sites in Mozambique: A - Maputo Special Reserve, B - Inhaca Island, C - Macaneta, D - Sao Sebastiao Sanctuary, E - Bazaruto Archipelago, F - Primeras and Segundas Archipelago.

prevent the use of illegal fishing gear associated with high rates of turtle bycatch. Twenty-four community rangers have been trained to identify and tag turtles and monitor nesting activity. These rangers have also established conservation awareness and outreach programs among the local communities in the islands in order to reduce turtle bycatch and egg poaching. There has already been a tangible change of attitude among local fishers demonstrated by their willingness to support the monitoring. Thus far they have brought in 111 turtles to be tagged and released as well as recapturing and recording 25 previously tagged turtles. Initial results indicate that this region may be an important feeding site for green and hawksbill turtles and that the nesting season in the northern section varies significantly from that in the central section described by Louro *et al.* (2006). Interestingly, among the 50 turtles captured in nets by local Mozambican fishers at Puga Puga Island was one green turtle captured in August 2006, which was originally tagged in 1994 on the Island of Mayotte in the Mozambique Channel (tag number MAY 6091). This animal was recaptured in Mayotte three months after it was tagged and had not been encountered again until it turned up in Mozambican waters 12 years later. Three of the turtles captured, tagged and released at Puga Puga were later discovered nesting on the island, indicating that the local artisanal fishery is interacting with adult females.

The central section of the coast stretches 950 km between Pebane (17º20'S) and Bazaruto Island (21º10'S) (Massinga & Hatton 1996) and has some coral reefs (Schleyer *et al.* 1999). However, twenty-four rivers discharge into the Indian Ocean along this section, each with an estuary supporting well-established mangrove stands. The coastal waters are shallow and the sediment loading from the rivers results in high turbidity levels (Schleyer *et al.* 1999). Loggerhead, green, leatherback, hawksbill and olive ridley turtles are known to occur along this section of coast. While nesting is mainly by loggerheads and occurs between October and February, green, hawksbill and leatherback turtles have been recorded nesting in the area (WWF 2005; Louro *et al*. 2006; Videira & Louro in prep.). The MMTWG has also been working with fishing communities in Bazaruto Archipelago National Park, where local fishermen reported the capture of 25 turtles (19 green, 3 hawksbill, 3 loggerhead) during the 2005/6 season. All these animals were tagged and 9 were later recaptured by local fishers (WWF 2005). While the foundation has been laid for ongoing work in Bazaruto, efforts have been constrained by time, funding limitations and availability of rangers.

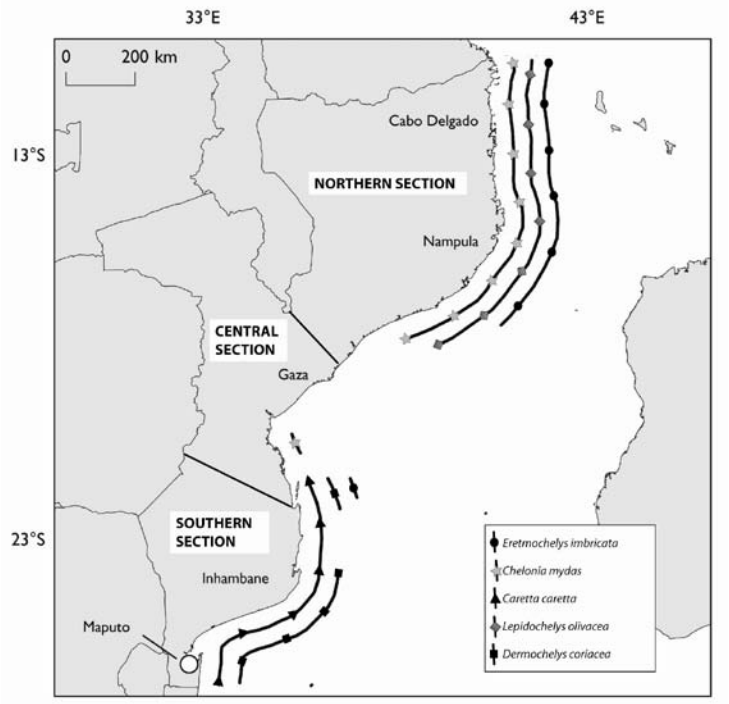

Figure 2. Presence of nesting turtles across the three coastal regions of Mozambique.

The southern section stretches for 850 km from Bazaruto Island southwards to Ponta do Ouro (26º 50'S). This part of the coast is characterised by high parabolic dunes backed by coastal barrier lakes (Tello 1973), north-facing bights and extensive sandy beaches (Hatton 1995; Massinga & Hatton 1996). The dune systems attain heights of 120m, considered to be among the highest vegetated dunes in the world (Hatton 1995). This section of the coast is an important nesting area for loggerhead and leatherback turtles (Tello 1973; Gove & Magane 1996; Magane & João 2003; WWF 2004; Louro *et al.* 2006). While hawksbill nesting is limited to the northern section of the coast, studies in 2004 and 2005 revealed that this species also forages in the coastal waters off southern Mozambique (WWF 2005).

In October 2004, the MMTWG initiated a project in collaboration with the local community at the Maputo Special Reserve (MSR), an important nesting site for loggerhead and leatherback turtles (WWF 2004). Between October 2004 and March 2005, 34 turtles were observed along a 29km stretch of coast from the MSR to Ponta Chemucane. Twenty-seven of these (21 loggerhead, 1 hawksbill, 5 leatherback) were tagged with Mozambican tags and 7 nesting loggerhead females were observed with South African flipper tags providing further confirmation of a nesting population shared between the two countries. Rangers in the same area observed 239 nesting attempts, 83 of which were false crawls (62 by loggerhead turtles and 21 by leatherbacks) while 156 attempts resulted in nesting (109 loggerhead and 47 leatherbacks). During this period, more than 90 loggerhead nests successfully hatched. Rangers also hand captured and tagged one hawksbill turtle foraging in shallow water in the Reserve (José João, pers. observ.) indicating that hawksbills may occur along the entire coast of Mozambique.

In summary, while the northern coastal section provides important nesting and feeding habitats for green and hawksbill turtles, the southern section provides important nesting habitat for loggerhead and leatherback turtles. Priority should be given to continued surveying for the presence of marine turtle nesting in the most northern section, particularly in the Primeiras and Segundas Islands as the nesting seasonality appears to be different to that in the Quirimbas Archipelago, where studies are ongoing. As a result of the work carried out by the rangers, fishers and local community, there has been a substantial reduction of poaching of turtles and turtle eggs. Furthermore, the artisanal fishers operating in coastal provinces of Mozambique are becoming more involved with marine turtle conservation through active involvement in the turtle tagging and monitoring programme. Indeed, local fishers brought in 90% of turtles tagged by rangers, suggesting a change in the attitude of local fisherman that is significantly contributing to the success of the project. Ultimately, the marine turtle tagging and monitoring is enabling coastal communities, conservation agencies, NGOs,

private sector partners and government agencies to become more informed and develop capacity to influence government decision-making regarding urgently needed marine turtle conservation in Mozambique.

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Predation on the Zoanthid *Palythoa caribaeorum* (Anthozoa, Cnidaria) by a Hawksbill Turtle (*Eretmochelys imbricata*) in Southeastern Brazil

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Hawksbill turtles, *Eretmochelys imbricata* (Linnaeus 1766), occur throughout the world's tropical and subtropical oceans, ranging primarily from 30°N to 30°S (Meylan & Redlow 2006), being found mainly in the tropical regions of the Atlantic, Indian and Western Pacific oceans (Lutz & Musick 1997; Meylan & Redlow 2006). In the Western Atlantic Ocean they have been observed from the southern USA to southern Brazil, throughout the Central America, Bahamas and Caribbean Sea (Meylan & Redlow 2006). Young hawksbill turtles are unable to dive into deep waters, being forced to live in masses of floating sea algae, such as *Sargassum* (Lutz & Musick 1997; Pope 1939). After this early, long pelagic phase, benthic adult individuals typically inhabit coral reefs and other hard-bottom habitats (Carr *et al.* 1966, 1982). In addition, hawksbill turtles are most frequently observed in reefs where the sponge population is vast (Pritchard 1979). They are also found in mangrove bordered areas, shallow inlets, remote oceanic islands, offshore cays and mainland shores. Usually, they are found in water no deeper than 18m (Ernst 1982; Ernst et al. 1994; Pritchard 1979). They are listed as an endangered species in Brazilian waters under the Endangered Species List of 2003 (MMA 2003).

Although omnivorous, hawksbills seem to prefer invertebrates, feeding almost exclusively on sponges (León & Bjorndal 2002; Meylan 1988; van Dam & Diez 1996), but other prey items found inside their guts include cnidarians (the Portuguese man-of-war *Physalia physalis* and others siphonophores, thecate hydroids, corals, and the zoanthid of the genus *Zoanthus*), ectoprocts (*Amtria*, *Steganoporella*), sea urchins, gastropods and bivalve mollusks (*Pinna*, *Ostrea*), barnacles, crustaceans, ascidians and fishes (Den Hartog 1980; Ernst 1982; Pemberton *et al.* 2000; Pritchard 1979) and some algae (*Cymodocea*, *Conferva* and *Sargassum*) (Carr 1952; Carl *et al.* 1994).

Den Hartog (1980) found some specimens of sea anemones (*Anemonia sulcata*) and stalks of a thecate hydroid (Aglaophemiidae) in the stomach of hawksbills. The author used the cnidome (types and sizes of the nematocysts) and some remnants of the animals to identify their presence. However, he also found other types of nematocysts, probably from an anthomedusae and some chondrophoran (probably *Velella velella*) and scyphozoan nematocysts.

Here we present the record of a hawksbill feeding on *Palythoa caribaeorum* (Duchassaing & Michelotti 1860) colonies close to the Laje de Santos Marine Park (24°15'48"S 46°12'00"W), a rocky reef ca. 40 km off Santos, São Paulo State, Brazil on 4 March 2007. Underwater photographs were taken using a digital camera.

The hawksbill turtle specimen was seen at a place where the zoanthid colonies are plentiful. It lay on lateral rock and start to bite, tear and pull out colony parts from the rock that were immediately eaten (Figure 1).

Palythoa caribeorum is an anthozoan cnidarian that produces a massive quantity of mucous for its protection; this mucous contains a toxin called palytoxin (PTX) (Gleibs *et al.* 1995). The palytoxin (PTX) is a non-protein molecule and it is the most poisonous marine toxin known to date, resulting in alterations in skeletal muscles and affecting some physiological processes (Mereish *et al.* 1991; Tesseraux *et al.* 1983). Considering the feeding behavior of *E. imbricata*, PTX apparently does not affect this turtle species, probably due to an undescribed metabolic mechanism of toxin protection. A similar 'strategy' is known for the green turtle, *Chelonia mydas*, which can eat the most venomous animal of the world, the box-jellyfish *Chironex fleckeri* (Hamner *et al.* 1995).

Predation on zoanthids by hawksbill turtles is documented for *Zoanthus sociatus* from the U.S. Virgin Islands: it was recorded for some juvenile hawksbills and one adult at Buck Island (USVI), which has little or no sponges present (Pemberton *et al.* 2000). Similarly, the sponge community of the subtropical rocky reefs of Laje de Santos Marine Park is composed of small crypt and flat encrusting species very different from the complex structured sponge communities found in coral reefs (OJL Jr. pers. obs.). Hawksbill turtles show a strong selectivity for certain sponge species as food items (León & Bjorndal 2002), but apparently prey on zoanthid cnidarians when sponges are not fully available.

This type of predation may be a way of dispersion for the zoanthids, because during foraging by hawksbills a number of polyps may be released in the water column. Released polyps can settle on another rock and could regenerate and develop a new colony. The fragmentation of zoanthid colonies as an asexual form of reproduction has been reported in the literature (Ryland 1997).

More monitoring of hawksbill foraging in this and other areas is warranted, particularly as this current note is based on a single individual. An interesting point suggested by van Dam & Diez (1997) is that hawksbill turtles may remain within a home range of limited area. Repeated sightings of tagged hawksbill turtles at fixed locations (Bjorndal *et al.* 1985; Boulon 1983), further support the observation that hawksbill turtles are relatively sedentary after reaching an adequate feeding area (Pritchard & Trebbau 1984).

This work also reinforces the importance of photographic records made by recreational scuba divers in ocean areas. The Laje de Santos Marine Park is a sanctuary in which sampling is restricted due to its distance from the coast. Accordingly, high quality photography is a useful tool for recording species and to obtain information *in situ*, thus preserving the communities of the protected area.

Acknowledgments: We thank the NGO Instituto Laje Viva for providing the support in this study. We are deeply indebted to Dr. F.L. da Silveira (IB-USP) for providing laboratory facilities and great friendship. We thank to Drs André C. Morandini and Elisabeth G. Neves by the criticism in the manuscript. We also thank to two anonymous referees for valuable comments and suggestions on the manuscript.

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Figure 1. Predation on the zoanthid *Palythoa caribaeorum* by a hawksbill turtle (*Eretmochelys imbricata*). **A** – The turtle is arriving at the rocky outcrop; **B** and **C** – The turtle is eating zoanthid colonies.

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Rat Eradication as Part of a Hawksbill Turtle (*Eretmochelys imbricata*) Conservation Program in an Urban Area in Cabedelo, Paraíba State, Brazil

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The nesting of hawksbill turtles (*Eretmochelys imbricata*) in Paraíba State, northeastern Brazil, was first recorded in disturbed urban areas at Mar de Macaco in the municipality of Intermares (Mascarenhas et al. 2003, 2004). The Urban Turtles Project (UTP) was established during those studies and continues to monitor and manage the hawksbill nesting and green turtle (*Chelonia mydas*) foraging areas located there. The central area of the UTP effort is a highly developed, recently occupied (about 15 years) coastal community with resultant environmental impacts. A river mouth to the south of the project area drains a mangrove swamp, thus many species of birds, lizards, snakes and invertebrates are found in the narrow vegetation belt (60 m on average) landward of the nesting beach.

During the 2003/2004 and 2004/2005 nesting seasons, an invasion of brown rats (*Rattus novergicus*) became a threat to nesting success, with an estimated loss of close to 3000 eggs and hatchlings (Figure 1). The brown rat, an aggressive species, is able to locate nests and kill hatchlings inside the egg chamber before emergence. To tackle the problem it was decided to eradicate the rodents along a 2.3km section of the nesting area that is limited north and south (7°02'11" S 23°50'09" W and 7°03'18" S 34°50'35" W) by two small intermittent streams. The objective was to eliminate brown rat depredation of eggs and hatchlings.

The eradication program was conducted in four steps: 1- survey of non-target fauna, 2- setup of the management area, 3- anticoagulant poisoning campaign, and 4- continued monitoring to prevent recolonization. The non-target species were determined by direct observation, bibliographic research and consulting the reference collection of the Mammalian Cytogenetic Laboratory of the Paraíba Federal University. The results indicated that the mastofauna is impoverished as a result of urbanization. Local populations of two alien species of rodents (*R. novergicus* and *Mus musculus*) and one native species of marsupial (*Didelphis aurita*) were expected to be present, the latter population also expected to be in a state of disequibrium. However, there appeared to be a high diversity of predatory and scavenger birds, all of which could be affected through secondary poisoning (by feeding on dying or dead poisoned rats). Two species of owls were observed, the white owl (*Tyto alba*) and burrowing owl (*Athene cunicularia*), five species of hawks (*Polyborus plancus*, *Rupornis magnirostris*, *Milvago chimachima*, *Elanus leucurus*, and *Falco sparverius*) and three species of vultures (*Cathartes aura*, *C. burrovianus*, and *Coragyps atratus*). The herpetofauna and invertebrates were not considered to be threatened as the poison affects mammals, birds and fishes only. The fish were not surveyed because poisoning was conducted in the upper part of the beach and the bait was protected against rain and removal from bait stations, to avoid the risk of water contamination.

For poison, we used the anticoagulant brodifacoum, which is lethal to rats even in small concentrations. Brodifacoum acts by disrupting Vitamin K production needed for blood clotting. It has been successfully used in a similar project in Sangalaki, Indonesia, and evaluated by the Canadian Health Agency (Meier & Varnham

Figure 1. Hawksbill hatchlings, from nests laid in an urban area in northeastern Brazil, attacked by rats .

2004; HEALTH CANADA 2004). The poison was deployed in wheat grains embedded in 20g blocks of blue wax. To reduce the risk of poisoning non-target species, poisoned baits contained "bitrex," which adds a bitter taste that is detectable by non-rodent species. The poisoned bait was placed in bait stations made of recycled plastic bottles with 15cm diameter end openings. These were anchored with wire to avoid the bait being removed from the station. To further reduce the risk of non-target species poisoning, the area was regularly monitored and exposed carcasses were removed to avoid consumption by scavengers. (Meier & Varnham 2004; Health Canada 2004).

A grid with 192 bait stations was established along the vegetation belt. Bait stations were distributed in three transects parallel to the sea shore. The first transect was placed seaside of a sidewalk along the edge of the vegetation belt. In this transect, stations were placed 100m apart. The second transect was placed along the middle axis of the vegetation belt, and the third transect was placed where the vegetation joins the sand beach. In the second and third transects, the stations were 25m apart. Two bait blocks were placed at each station and were replaced on a daily basis during the first two weeks. From the third week to the end of the program, the bait was replaced twice per week. The eradication program lasted 15 weeks, but all evidence of rats on the beach disappeared within six weeks. However, a small and somewhat constant bait consumption was observed throughout the program. After 15 weeks, the bait stations were removed and a new grid was established for the continued monitoring. Stations were placed every 100m along all three transects and poisoned baits were replaced monthly to detect new invasions.

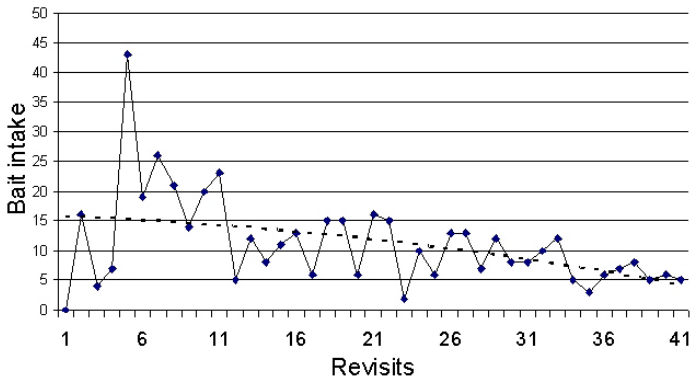

Figure 2. Distribution of the bait intake. Y axis represents the number of 20 g bait blocks replaced each revisit to bait stations. Revisits axis represents each revisit of bait stations.

The eradication process was considered complete when an evaluation of the direct and indirect evidences of the presence of rats on the beach met the following criteria: 1- the bait intake decreased to very low and constant levels, likely being due to non-target invertebrate consumption, such as cockroaches and other insects (Fig. 2); 2- no dead or alive rats or decaying odor was observed after 10 weeks; 3- no footprints, tracks on vegetation or evidence of food intake were observed; and 4- no further depredation of hawksbill turtle nests was observed.

A total of 461 poison blocks were consumed, or 9.5 kg (20.9 pounds). Despite the efforts to recover all the carcasses, only eight were actually found, although the odor of decay was present throughout the area. This is likely to be due to the features of the beach and the species behavior. Brown rats spend their inactive periods in burrows and were presumed to have died underground. Only one non-target marsupial (*D. aurita*) was found and was likely poisoned during the eradication program. Four poison blocks presented teeth marks compatible to those of a lizard (estimated body length 20 cm). During the final two weeks, several bait station were infested by dozens of cockroaches that completely covered the bait blocks

We successfully achieved rat eradication in the target area. No nests were attacked by rats in the 2005/2006 season or in the ongoing 2006/2007 season. A continued monitoring program to prevent new infestations is being conducted by the Urban Turtle Project staff, on a volunteer basis with support from the municipal administration for materials. The results show that a simple procedure with low financial and environmental costs can have significant conservation effects for sea turtles.

Acknowledgements: Albano Schulz Neto identified the birds; Valdi S. Moreira, Adailton Galdino, and the students and volunteers of the Urban Turtle Project conducted most of the field work; the Municipal Agencies of

Environment and Health of Cabedelo (PB, Brazil) provided the materials for the program; the Laboratory of Cytogenetic of Mammalians, UFPB, opened the reference collection and library to the identification of the mammals, snakes and lizards; the anonymous referee revised the manuscript and deeply improved the language.

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Morphodynamics of an Olive Ridley Nesting Beach in the Baja Peninsula

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The Sea Turtle Protection and Conservation Program of the Los Cabos Council monitors more than 30 km of coastline at the southern tip of the Baja Peninsula in Mexico for sea turtle nesting activity. Within this area, El Cardoncito is the most important of the 12 nesting beaches for the olive ridley *Lepidochelys olivacea*, where 20-30% of clutches have been found in recent years (Monroy-Garcia 2004; Tiburcio-Pintos 2005). This is a 1.16 km long pocket beach bounded by rock platforms at either end (Fig. 1). Two dry arroyos influence the beach during the sporadic summer flashfloods associated with tropical storms. The beach sand grain size ranges from medium to coarse (0.48 to 0.7 mm in diameter). The finer sand is found in the zone used most commonly for nesting, close to the base of the dune ridge. The coastline orientation is SW-NE and is subject to high energy waves entering the Gulf of California from the Pacific Ocean and approaching the beach from the southeast due to wave refraction.

We investigated the possible influence of beach sand cycles in the nesting preferences of the olive ridley turtle. We presumed that changes of beach morphology due to littoral transport and sand input from dry arroyos may modify the conditions for sea turtles nesting. We divided El Cardoncito beach into four sections from north to south (Fig. 2). Section 1 contains the highest number of olive ridley nests. Section 4 is characterized by a rocky zone of the coast. Sections 2, 3 and 4 are also influenced by nearby streams. We analyzed the morphodynamics of the beach using computer simulations of the beach topography measured at the four sections (dots in Fig. 1). The Emery method was used to profile the beach with two 1.8 m stadia rods joined with a 4 m cord (Krause, 2004), with independent benchmarks for each section at the starting point (dune base). The olive ridley nesting season runs from July to November in the East coast of the Southern Baja Peninsula, with a seasonal peak of nests in September each year (35-50%). In order to compare the beach morphology during the main nesting season, beach profiles were measured in July, September and October of 2005. During the hurricane season (from July to September), associated wave activity normally erodes the beach creating scarps that make it difficult for turtles to nest. This is usually followed by a period of beach accretion. However, hurricane activity in the area during our study was low and none struck the peninsula.

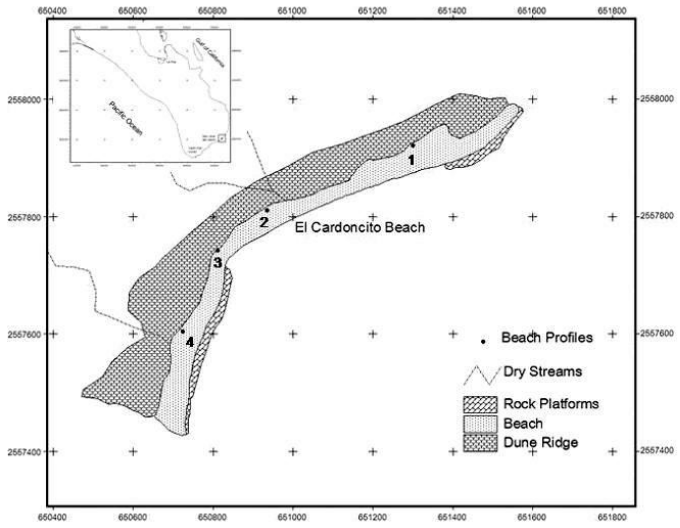

Figure 1. Map of El Cardoncito beach.

We developed a MATLAB 7.0 computer program for the 3D simulation of the beach topography from irregularly spaced points (Appendix I). Orthogonal distances (m) from coastline and elevations (cm) were used in the simulation. In the simulation for July, the beach was widest during the early part of the nesting season, when the lowest elevations were found in section 1 and the berm was not evident. In the simulation for September, a higher elevation of the nesting zone in section 1 was observed due to increased wave swells that in turn lead to berm development on the northeastern side of the beach; this berm persisted until October, when the beach begins another cycle and the berm disappeared. No beach scarp formation was observed at site 1 during the three surveys (Fig. 2).

These results show that olive ridley turtle nesting overlaps with the occurrence of higher beach elevations where the sand thickness is greater and perhaps more favorable for nesting activity. At these elevated sites, the nests are laid beyond the wave swash zone, and apparently have suitable conditions and appropriate humidity levels for excavation and embryonic development. There is no information about hatch success since all clutches are relocated to the protected

areas. However, these results contribute to understand the nesting site selection process. The beach condition during September could be related to the high percentages of nests laid during August and September (usually more than 60%).

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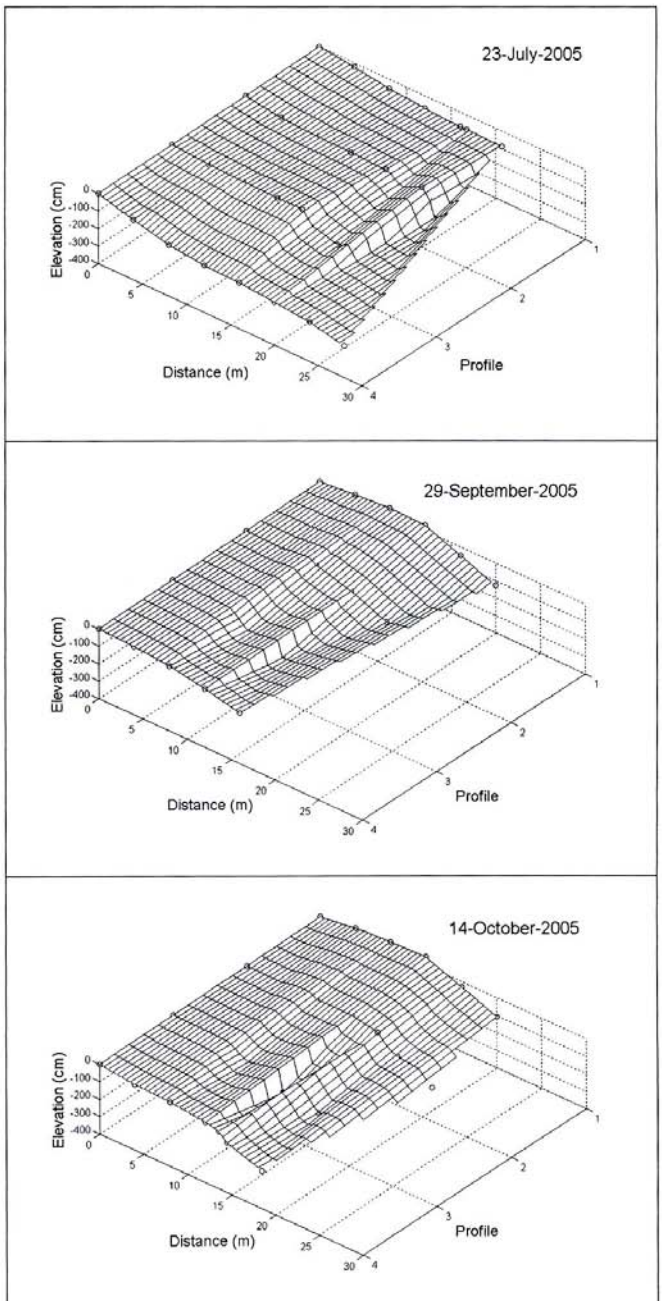

Figure 2. Beach Morphodynamics from computer simulations. Measured beach profiles are indicated by dots. Distances are referred from the coast.

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Appendix

Matlab 7.0 program to simulate the beach morphology from profiles data

```
function playaP(np)
% np= Number of profiles, each one captured in an ascii file data
with .dat extension

x=[]; y=[]; z=[];
for ip=1:np
   [filename, pathname, filterindex] = uigetfile('*.dat', 'Select a
profile data file');
   playa=filename(7:8); dd=filename(13:14);mm=filename(11:12)
;aa=filename(9:10);
   aaaa=['20' aa];
   fecha=datestr(datenum(str2num(aaaa),str2num(mm),str2num(
dd)),1);
   matriz=load([pathname filename]);
   [n,n2]=size(matriz);
   yy=[]; zz=[];
   yrel(2:n+1)=matriz(:,1); xrel(2:n+1)=matriz(:,2);
   yrel(1)=0;xrel(1)=0;
   for i=1:n+1;
      zz(i)=sum(yrel(1:i));
      yy(i)=sum(xrel(1:i));
   end
   y=[y yy]; z=[z zz];
   x=[x ip*ones(1,n+1)];
end

yi = 0:0.5:30; xi=1:0.2:np; % grid density to interpolate elevation
values
[XI,YI] = meshgrid(xi,yi);
ZI = griddata(x,y,z,XI,YI);
figure; hold on
mesh(XI,YI,ZI)
plot3(x,y,z,'ok')

xlabel('Profile','FontSize',14);set(gca,'XTick',1:np);
ylabel('Distance (m)','FontSize',14);
zlabel('Elevation (cm)','FontSize',14)
grid on
view(130,70)
title([playa ', ' fecha],'FontSize',14);
axis([1 np 0 30 -400 0]); %Adjust scales depending of length of
the beach and maximum elevation.
colormap copper
```

First Records of Olive Ridley Turtles (*Lepidochelys olivacea*) in Seychelles

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The first ever recorded occurrence of the olive ridley turtle *(Lepidochelys olivacea)* in Seychelles waters was made on 12 September 2006, followed by a second record less than eight months later on 4 May 2007. Both were juveniles. The first was documented by a team from the Conservation Division of the Seychelles Ministry of Environment and Natural Resources (MENR) who were called in to examine a dead turtle floating in the Victoria harbour of north east Mahe at the Inter-Island Quay, in the vicinity of the Industrial Fishing Port where tuna fishing vessels come to unload their catch. Its carapace measured 33.2 cm notch-to-tip (CCLn-t) and it was badly decomposed making it difficult to identify. Based on photographs, JAM identified it as an olive ridley, and this was confirmed by Pam Plotkin, Alberto Abreu-Grobois, and Peter Pritchard (pers. comm. to JAM). Photos of this turtle can be seen here: http://www.seaturtle.org/cgi-bin/imagelib/index.pl?cat=500&si=remie&stype=1&thumb=1

The second record was reported on 4 May 2007 by Elke Talma of the Marine Conservation Society of Seychelles (MCSS) who was called out to rescue a live turtle that had washed ashore in north west Mahe tangled in marine debris and with a gangrenous front flipper (MCSS 2007). It measured 34 cm (CCLn-t) carapace length, and was photographed and later identified as an olive ridley by Michael Coyne and Brendan Godley (pers. comm. to MCSS). It unfortunately lost its flipper on the spot; but after being disentangled, was released in apparently otherwise good condition (MCSS 2007).

The obvious question is why two records of this species would be reported within such a relatively short time after never having been recorded previously (Frazier 1984; Mortimer 1984), despite a very active turtle monitoring and conservation programme ongoing in Seychelles since 1995 (Mortimer 2000). When the first specimen was retrieved dead in the harbour, we considered the possibility that it represented by-catch discarded by purse seiners, which are known to occasionally capture small turtles (Domingue & Mortimer 2001). The second turtle, found alive, *albeit* entangled in debris, implicates marine pollution.

The olive ridley nests along the African and Indian coastlines (Frazier 1984), so its occurrence in Seychelles waters is not unexpected. Maybe under normal circumstances its pelagic lifestyle and relatively small size make it inconspicuous to human observers. But, both individuals reported here appear to have suffered traumatic events, perhaps associated with some combination of by-catch, ghost fishing, and extreme weather systems. This begs the question as to whether such events have increased in frequency. One might also consider the theory that climate change is affecting the current systems of the Indian Ocean, causing them to carry members of this species into waters where they previously did not occur (MCSS 2007). But the lack of supporting evidence for that theory indicates a need for further investigation.

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Sexual Harassment By A Male Green Turtle (*Chelonia mydas*)

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Male sea turtles (family Cheloniidae) are notoriously indiscriminate in mating behavior, facilitating hybridization among most of the species in this family (Karl et al. 1995). Male turtles are harvested in several locations around the world with crude decoys. Brazilian fishermen use a wooden disc attached to a rope. They reel in the disc after a male turtle mounts it, secure in the knowledge that the turtle will not release the decoy. Caribbean fishermen also use wooden decoys, and Polynesian fishermen use floating taro leaves to attract male turtles for spearing.

Male sea turtles occasionally attempt copulation with human swimmers, snorkelers, or scuba divers (W.N. Witzell, pers. comm.). The loggerhead (*Caretta caretta*) mating population in Southeast Florida lies adjacent to one of the most densely populated coastlines in the world, and every year a few people are approached or (more rarely) mounted by male loggerheads. NOAA diver Jack Javech of the U.S. National Marine Fisheries Service Miami Laboratory reports two copulation attempts by male loggerheads while scuba diving in the Florida Keys (J. Javech, pers. comm.). During a separate incident in the same area, a turtle mounted a male scuba diver and "made good its mating attack on this luckless individual" (Epstein 1989). A commonality in these events is that the male turtle attempts to pin the victim to the bottom. These are large powerful animals, with potential to inflict injury or even drown an unsuspecting swimmer.

On the morning of May 5, 2007, the author was collecting reef fishes at Cocos Island (Australia) on the upper edge of a slope at 20 meters depth. Water temperature was 26° C, and visibility was approximately 30 meters. The dive team included Luiz A. Rocha and Matthew T. Craig from University of Hawaii, J. Howard Choat from James Cook University, and Robert "Greenie" Thorn of Parks Australia. Reef fish collections were conducted with a three-prong spear commonly called a Hawaiian sling.

In five days of fish collections at Cocos Island, the author had previously observed two sea turtles, a mature female green turtle (*Chelonia mydas*) and an immature hawksbill (*Eretmochelys imbricata*; assignments based on morphology, size, and tail length). Both turtles exhibited a common response to scuba divers; they moved away rapidly.

On this occasion, a large green turtle came up the reef slope, and veered towards me rather than exiting the area. This was a mature male green turtle with a large tail, and a mass exceeding 100 kg. The turtle approached slowly, on a course that passed about two meters to my left. Immediately after passing, the turtle veered sharply towards my backside. I turned and placed the tip of the Hawaiian sling (length 2. 5 meters) on the turtle's side behind the foreflipper. In this orientation, the turtle and I made three full rotations, with increasing pressure applied on the spear as the turtle tried to approach my backside. Subsequently the turtle broke off the engagement and continued on his previous track towards the shallow reef.

Upon return to the support boat, Greenie Thorn remarked that the nesting season for Cocos Island sea turtles was approaching. Hence the highest risk of assault may be during the conventional mating season.

While such behavior is known previously, the victims usually lack the experience to identify the species and key behaviors of the male turtle. Hence it is appropriate to record the behaviors that indicate an imminent attack. In this case, the initial indicator was that the turtle changed course and moved purposely towards the target, rather than leaving the area.

Not all sea turtles avoid people. In Hawaii, green turtles routinely swim among bathers and divers with no apparent alarm (Balazs 1996). However, even in this benign environment the turtles may avoid swimmers who move too close, and these turtles do not deliberately approach humans. The Hawaiian nesting beaches at French Frigate Shoals are more than 1000 km from populated centers, so that sexually active males may have less proximity to people, the precondition for problems in Florida.

The green turtle described here did not raise fore-flippers in an attempt to grasp the target, as they do with conventional mating. Probably by the time that occurs, the interaction is inevitable. The only advanced warning was the deliberate approach of a male turtle, and the only acute signal was the ongoing attempt to approach my backside. Both behaviors are unusual and should be regarded as harbingers of a copulation attempt.

Acknowledgments: The author thanks G.H. Balazs, J. Javech, S.A. Karl, and W.N. Witzell for comment and review, and Robert "Greenie" Thorn, L.A. Rocha, M.T. Craig, J.H. Choate, and Parks Australia for logistic support. The Cocos Island expedition was supported by National Science Foundation grant OCE-0453167 to BWB, and National Geographic Society grant 8208-07 to M.T. Craig.

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Incidental Capture of a Leatherback Along the Coast of Ceara, Brazil

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On 13 November 2006, a live leatherback was observed stranded on Mundaú Beach, in the municipality of Trairí, in the state of Ceará, Brazil (3.1776° S, 39.3794° W). The turtle measured 149cm curved carapace length and 106cm curved carapace width. The proximal end of the turtle's left front flipper was tightly entangled in approximately 30m of monofilament nylon fishing line, apparently for some time, as the majority of this flipper was suffering necrosis from lack of blood supply. The turtle died <120min after it was found on the beach, likely from infection associated with the wound. We performed a necropsy on this animal and found that her reproductive tract contained several sets of eggs at different stages of development. The fishing line as identified as being similar to the secondary line used by pelagic long-line fisheries targetting albacore tuna (*Thunnus alalunga*). A fleet of pelagic long-line boats is based in Recife, Pernambuco (Coluchi *et al*. 2005), which lies adjacent to Ceará.

The waters off the coast of Ceará is important for foraging, development and migration of sea turtles in Brazil (Marcovaldi 1993; Lima *et al*. 1999; Lima *et al*. 2003; Godley *et al*. 2003). Projeto TAMAR-IBAMA, the national sea turtle project in Brazil, operates a research station in Almofala, Ceará. Long-term monitoring in Almofala has revealed that all five species of sea turtles that occur in Brazil, including leatherbacks, interact with fisheries in this region (principally fishing weirs, gillnets and hook and line). Stranded leatherbacks have been observed in nearly all states in Brazil, with greater numbers of strandings being reported in recent years (Barata *et al*. 2004). Interactions between long-line fisheries and leatherbacks (in addition to other species) are most commonly observed in waters off of more southern states in Brazil (Kotas *et al.* 2004). Interestingly, there have been several stranded leatherbacks in Brazil that were missing one or both front flippers (Projeto TAMAR-IBAMA, unpub. data). The confirmed link between a long-line interaction and flipper injury in the leatherback observed in Ceará suggests that at least some of the other stranded leatherbacks could have suffered interactions with pelagic long-lines. Onboard observers in long-line fisheries off the Brazilian coast also report that leatherback turtles tend to be foul-hooked in the flipper rather than the mouth (Kotas *et al.* 2004; Pinedo & Polacheck 2004).

The source rookery of this leatherback remains speculative. Leatherback nests have never been recorded in Ceará. The primary nesting beaches for leatherbacks in Brazil are in Espírito Santo, in the southeastern region (Thome et al. 2007). The closest known rookeries are to the north in French Guiana (Girondot & Fretey 1996), although to date no post-nesting female leatherbacks from French Guiana have been observed moving south of the equator (Ferraroli *et al*. 2004). The reproductive state of this stranded leatherback overlaps more with the nesting season in Espírito Santo than in French Guiana, although it is possible that there is unobserved nesting by leatherbacks in northeastern Brazil. Genetic analyses of tissue taken from this turtle may help resolve this issue, and further monitoring for other reproductively active female leatherabacks in the waters of Ceará is warranted.

Acknowledgements: The TAMAR/Ceará trainees Ligia Santanna, Marcello Spiandorin, André Meneses helped with the response and necropsy. Thanks to Max Rondon Werneck and Cecilia Baptistotte, veterinarians of Projeto TAMAR for their help in the initial treatment of the animal. Thanks to Bruno Giffoni of Projeto TAMAR Ubatuba for help in identifying the entangled fishing gear. Projeto TAMAR is part of the Ministry of Environment, is co-administered by Fundação Pró-TAMAR and is officially sponsored by Petrobrás.

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Book Review

Title: Livelihoods, Community Well-Being, and Species Conservation: A Guide for Understanding, Evaluating and Improving the Links in the Context of Marine Turtle Programs

Year: 2006
Author: Montoya, F. & C. Drews
Publisher: WWF – Marine and Species Program for Latin America and the Caribbean, San Jose, Costa Rica.
ISBN: 9968-825-32-8
Pages: 86pp
Source: http://www.panda.org/about_wwf/where_we_work/latin_america_and_caribbean/publications

Given the increasing number of 'community-based' sea turtle conservation initiatives worldwide, it is perhaps surprising that a manual such as this has only recently been published. Targeted toward environmental conservation organizations (ECOs) that have marine turtle programs, it will be of interest to all such organizations who work in rural communities in the developing world.

There are two main purposes of the book: (1) to outline a conceptual relationship between marine turtle conservation and community well-being; and (2) to present a methodology for identifying, monitoring, and improving the links between them. The first chapter of the book is dedicated to outlining the conceptual relationship, exploring key concepts such as community, livelihoods, poverty, well-being, and community capitals (e.g. social, natural, financial, political). A significant strength of the conceptual approach is its holistic view of community well-being, moving beyond strictly economic considerations. Chapters 2 through 4 present the 'how to' elements of establishing a Community Livelihood Improvement Program (CLIP), including directions for identifying and monitoring links between marine turtle conservation and community well-being; establishing partnerships between the conservation organization, community, and government; creating a community plan; agreeing on a vision; and implementing participatory, adaptive data-based management. Chapters 2 and 3 offer an overview of the process, while chapter 4 provides a 'toolbox', including questions to stimulate discussion of key topics, specific group activities, and examples of appropriate targets and goals (e.g. 'conserve 100% of turtle nests', 'improve the access road', and 'build septic tanks'). The final chapter offers three case studies from Costa Rica and Panama.

Overall, this manual is a useful starting point for those conservation organizations who are considering linking their marine turtle conservation program to a community livelihood improvement program (CLIP), or for those who would like to expand or modify existing CLIPs. However, there are a few caveats. The description of the methodology (Chapters 2 to 4) is often too vague, particularly since it is targeted toward conservation organizations that may not have existing expertise or capacity in social sciences or community development. The substantial time, resources, and facilitation skills required to implement the participatory methodology outlined in the manual are not clearly specified; for those organizations that are already stretched, or who lack the relevant expertise, this should not be underestimated. While some activities are clearly described (for example, visualizing livelihoods using a time allocation analysis, p. 46), other activities, such as conducting a baseline survey, are only briefly covered (p. 54). Other similar manuals (e.g. Bunce et al. 2000) provide much more detailed and user-friendly instructions on the implementation of basic social science data collection and monitoring tools (e.g. surveys, interviews, focus groups).

Another concern regarding this publication is the assumption that participatory processes will be both possible and straightforward. The proposed 'CLIP' methodology emphasizes the importance of participation and relies heavily on participatory processes, such as public workshops and consultations, participatory data collection, and local involvement in baseline and follow up assessments. While this is certainly a valuable part of the methodology, too little consideration is given to the possible challenges. What if people are not interested in participating? What if interest wanes and community members develop 'participation fatigue'? What if people cannot afford the time to participate in the CLIP-related activities, such as day-long workshops? The importance of including underrepresented groups, such as women and the poor, is repeatedly highlighted. However, there are often complex cultural and political reasons for the exclusion of these groups from decision-making processes, and simply inviting them to public meetings will not guarantee their participation. Rather than simply assert the importance of equity and participation, the book could do more to acknowledge the challenges in achieving these, and to offer potential solutions (such as holding separate meetings for men and women).

The three case studies included in Chapter 5 (Tortuguero and Junquillal in Costa Rica, and Chiriquí in Panama) are helpful in illustrating the concepts and methodology outlined in the preceding chapters, providing rich detail regarding the evolution of CLIPS at three different sites. They also illustrate the complexities and challenges involved in conducting such programs, such as: the threat of external processes (e.g. foreign-controlled tourism development); the difficulty of realizing a 'community' vision in places where inter-group conflict is high; the need for outside expertise to facilitate a CLIP (as described in this book); and the fact that livelihood improvement programs do not necessarily guarantee widespread local support for marine turtle conservation.

While not without its flaws, this book provides a valuable contribution to the practical literature on marine turtle conservation. Readers actually intending to implement a community livelihood improvement program in conjunction with their marine turtle conservation work may need to consult additional sources (or, depending on their situation, seek outside expertise), but this document provides a good starting point. As to the key underlying assumption of this publication – that community-based conservation (or CLIP) is an effective way of pursuing marine turtle conservation – I refer readers to recent discussions in MTN (Ferraro 2005, 2006; Pritchard 2006). In the opinion of this reviewer, community well-being should be valued for its own sake, not simply as a means to an end.

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IUCN-SSC Marine Turtle Specialist Group Quarterly Update

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Several MTSG activities have been underway since our last quarterly reporting, yet the majority are still in process and therefore warrant little reporting. Herein we provide a brief summary of these activities, progress to-date, and expected timeframes for completion.

MTSG Member Survey: As an output from the Burning Issues 3 meeting of last August, an MTSG-wide survey was sent to every MTSG member on March 1 (plus as many as 2 individual reminders thereafter) and closed on April 9. The survey was generously implemented *pro bono* by a third-party professional research firm, CfMC Research Software, at the request of Mr. Peter Schireson of Schireson Associates. The purpose of the survey was to learn more about each other's work, specifically what is and is not being done by our fellow members to address each of the five major hazards to sea turtles that were identified in the 2nd Burning Issues meeting. Of the 226 members with who were sent the survey, 175 (77%) completed it in full. An additional 18 members (8%) accessed or began the survey, but did not complete it, and 34 members (15%) did not access the survey. In addition to reviewing and analyzing the survey responses, we also hope to identify the reasons for non-responsiveness and address these issues for future surveys. We are grateful to all who participated in this study and to those who provided input and support in the development of the survey itself. At this time we are still awaiting the summary of responses from CfMC and will report on those as soon as they become available.

***Lepidochelys olivacea* Red List Assessment:** Following initial review by the MTSG's Assessment Steering Committee and selected MTSG members between October 2006 and February 2007, as well as an open discussion on issues related to the assessment at the MTSG Annual General Meeting in South Carolina on February 28, multiple revisions and drafts, and lastly a five-day member-wide review period from April 2 to April 7 followed by further revision, the Red List Assessment for *Lepidochelys olivacea*, with a proposed listing of Vulnerable (A2bd), was submitted to the IUCN Red List Office for consideration on April 11, 2007. Because the Red List status of this species (Endangered) is under petition, the assessment submitted by the MTSG on April 11 is treated as the MTSG's justification of the Red List status of *Lepidochelys olivacea*. The petitioner also submitted a justification, and each is now being considered by the IUCN-SSC Biodiversity Assessments Standards and Petitions Working Group. Submission of these justifications represented Stage 7 in this petition (for more information on this process visit www.redlist.org). Immediately thereafter, the MTSG and the petitioner were each entitled to review the other party's justification and provide a one-page addendum to their own justification. The addendum was submitted by the MTSG on May 3, 2007. These justifications are now under review by the IUCN Red List Office and the IUCN-SSC Biodiversity Assessments Standards and Petitions Working Group, and we are awaiting information regarding their decision and steps forward. We will share this information as soon as it becomes available. Many thanks to assessor Alberto Abreu and Pam Plotkin for their hard work in preparing this assessment, and to all others who provided input and support into this important process.

***Eretmochelys imbricata* Red List Assessment:** We are pleased to report that the draft Red List assessment for the hawksbill turtle, *Eretmochelys imbricata*, has been completed by assessors Jeanne Mortimer and Marydele Donnelly, and was posted to the MTSG website (www.iucn-mtsg.org) and announced to the membership on June 26, 2007 for a two-month MTSG member-wide review period that will last until August 27, 2007. MTSG Members who wish to comment on this draft assessment should send their comments, before August 27, to assessors Jeanne Mortimer (mortimer@ufl.edu) and Marydele Donnelly (mdonnelly@cccturtle.org), with a copy to MTSG Red List focal point, Milani Chaloupka (m.chaloupka@uq.edu.au). If you have any difficulty accessing assessment files, please contact Brian Hutchinson (bhutchinson@conservation.org) for assistance.

Gahirmatha Turtles and Port Development: As you will recall from earlier reports, in December 2006 Nick Pilcher participated in

a mission to the coast of Orissa, India, as part of an IUCN delegation that had been invited by the TATA Steel company to provide an unbiased examination on the proposed development of a port at Gahirmatha. Slightly south of this proposed development is one of Orissa's three olive ridley *arribada* sites. Shortly after their initial visit, the delegation provided a quick summary of that visit, which included a member from IUCN HQ Business and Biodiversity Section and one of the representatives from the IUCN South East Asia office. The official report is now available at http://www.dhamraport.com/download/dhamraport_iucnreport.pdf. At present the Dhamra Port Company and IUCN are investigating ways in which IUCN may be able to provide input to further work related to the port, and we will keep you updated as this develops. Suffice it to say that the port development is a contentious issue, with a number of NGOs strongly opposing the development, and little agreement as to the scientific facts surrounding the issue. Our hope is that in the future we may be able to assemble a team with diverse backgrounds to further investigate this issue.

ANNOUNCEMENTS

Clearing House for Satellite Tracking Data

Michael S. Coyne[1] and Brendan J. Godley[2]

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The Satellite Tracking and Analysis Tool (STAT) is a free open-access product that automates the process of managing satellite tracking data, including daily data downloads, backups and map updates with a user-friendly online interface (Coyne & Godley 2005). To date, more than 750,000 locations from over 1,900 animals, including sea turtles, seabirds, marine mammals and sharks, are held within the system.

One of the major shortcomings of satellite telemetry is the relatively large up-front cost. Those deploying satellite tags within the Argos system can expect to pay $5,000 to $10,000 for each tag and associated satellite time, limiting most projects to a handful of tags each.

The increasing acceptance of STAT as the defacto standard for managing satellite telemetry data offers a unique opportunity to foster synergistic collaboration between projects and research groups, thus leveraging these relatively expensive data. To this end, we have launched a new service that allows STAT data holders to designate specific tags to be listed as available for collaborative data sharing. This new "Data Explorer" will allow users to query STAT data by species and location in a geographic browser and to highlight those data available for collaboration. The Data Explorer can be accessed online at http://www.seaturtle.org/tracking/explorer/.

Satellite trackers interested in using STAT should contact tracking@seaturtle.org. To learn more about STAT visit http://www.seaturtle.org/stat/.

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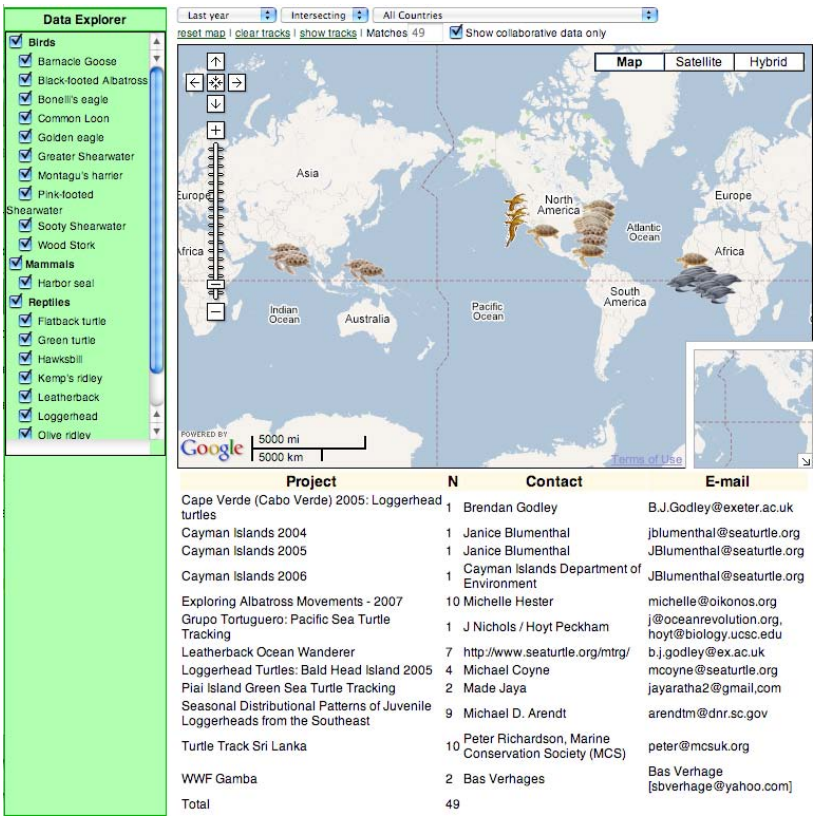

Figure 1. Screen shot of the Data Explorer tool. The URL for Data Explorer is www.seaturtle.org/tracking/explorer

28th Annual Symposium on Sea Turtle Biology and Conservation
Loreto, Baja California Sur, Mexico January 19-26, 2008

Wallace J. Nichols
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Venue and Theme: Our plans for the 28th Annual Symposium on Sea Turtle Biology and Conservation (STS) are coming together nicely. The Symposium will take place in the coastal town of Loreto, Baja California Sur, Mexico, from January 19-26, 2008. You may have heard that the symposium will be a different sort of gathering this year. It most definitely will, thanks to both the planning of the 2008 organizing committee, in Mexico and the U.S., and the venue itself. And there are a few things we hope that you will *think* about and *do* to make this a successful, unique and memorable week. This year's theme will be *Native Oceans*. It asks us to consider the relationship between sea turtles and humans and celebrate and learn about the world's turtle cultures, both past and present. We are making an extra effort to invite members of various indigenous groups working on sea turtle research and conservation programs. The Seri (Comcáac) Indians of Sonora, Mexico will share their leatherback ceremony throughout the STS. The *Native Oceans* theme also asks the question: "How many turtles were there?" Please consider taking some space in your presentation to describe your "baseline." In Baja, we get some fascinating insights into the former abundance of sea turtles based on accounts of native people, explorers and missionaries as well as whalers and early turtle hunters. Combined, this information may give us a sense of what the ocean was once like. Another theme of the symposium this year is *sustainability*. This year we have an ISTS "green team" working on making the footprint of the meeting compatible with our values. We ask that you consider this as you make your plans to attend. Michael Coyne and the ISTS 2007 organizers have left us in good shape financially and have set a high bar for a smooth-running and fun meeting. We hope to build on that and send a healthy, green ISTS on to Australia in 2009.

Why Baja California? Ten years ago, I worked with STS President Alberto Abreu and Raquel Briseño to help organize the 18th STS in Mazatlán. Afterwards, I sincerely asked Alberto to stop me should we decide to take on the STS in Baja. Years later, here we are planning the 28th STS in Baja (Albertoooooo!!!!). However, the reasons for this are compelling. First, it is an ideal opportunity for the members of the STS from around the world to interact, share and learn with our colleagues on the Baja California Peninsula. What has happened on the peninsula over the past two decades is worth pondering and discussing: a grassroots sea turtle conservation movement emerged out of communities where turtles were hunted to the edge of extinction. We believe there are now many new opportunities for fruitful collaboration between you and our colleagues in northwest Mexico and I'd like the chance to introduce you to them. It's likely that many members of the Grupo Tortuguero (the growing sea turtle network in northwest Mexico) would not normally attend the ISTS as many are fishers and low-income coastal residents and therefore wouldn't be able to afford the travel or the time away from home. Bringing the STS to them in Baja seemed a good idea. In addition, this year the STS coincides with the tenth anniversary of the Grupo Tortuguero (you can read more at: http://www.grupotortuguero.org). Turtles are making a comeback in northwest Mexico and we'll celebrate that together in Loreto. In a way, having the STS in Baja at the tenth anniversary of the Grupo Tortuguero is a gift to the people working on one of the "front lines" of sea turtle conservation. We think you'll enjoy meeting them, and vice versa.

Another reason for hosting the meeting in Loreto is because this is the "Year of the Sea Turtle" in Mexico. As the region's sea turtles return, people are faced with some new decisions about how to manage them. New marine protected areas and sea turtle reserves have been decreed while others have been proposed by fishers and coastal residents and supported by the state and federal governments. A new livelihood alternative associated with the protected areas is ecotourism. While visiting Baja you'll have the chance to learn about the reserves and participate in an emerging ecotourism economy. We deliberately chose to hold the ISTS in the town of Loreto rather than one of the existing coastal mega-developments such as Cabo San Lucas. It's my hope that the ISTS members will understand this choice as one in favor of spreading our dollars among many people and embracing a different model for tourism over the more convenient mega-resort choice. We want to be clear here that this choice begs your patience and planning as well as your responsibility for your own consumption and waste in order to be successful. Think: organic tequila, reusable cups, short showers, biodegradable soap, walks across the plaza and sustainable seafood! We hope that you come early to Baja and stay long. It is gray whale calving season on Baja's Pacific coast, the birding is excellent and the towns, islands and bays of the peninsula are wonderful to explore. We know that members of the Grupo Tortuguero will be proud to share their work with you.

An Evolving Schedule of Events: The final schedule for the meeting is still under development. The following represents the current thinking of the organizers (regular updates will be posted on www.seaturtle.org and CTURTLE). Due to limited resources and space in Loreto, and in order to accommodate members who make their living as fishers during the week the Grupo Tortuguero/RETOMALA meeting and the STS/regional meetings will be staggered; however, people are welcome to stay for all of the meetings if desired.

Friday (pm), January 18:
· 10th Grupo Tortuguero & Latin American Sea Turtle Specialists (RETOMALA) Meeting – arrival and registration opens
· Pre-Symposium excursions

Saturday, January 19
· 10th Grupo Tortuguero & Latin American Sea Turtle Specialists

(RETOMALA) Meeting – continues
· Pre-Symposium excursions continue
· Registration for STS open

Sunday, January 20
· 10th Grupo Tortuguero & Latin American Sea Turtle Specialists (RETOMALA) Meeting – continues and concludes
· Pre-Symposium excursions continue
· Other Regional Meeting attendees arrive
· Registration for STS open

Monday, January 21
· Pre-Symposium excursions continue
· Other Regional Meetings (WIDECAST, IOSEA, Mediterranean, Africa, etc); Locations TBA
· Registration for STS open

Tuesday, January 22
· Pre-Symposium excursions continue and conclude
· Other Regional Meetings continue and conclude
· Registration for STS open
· Sea Turtles of the Californias session (morning)
· Welcome social & opening remarks, music; Main Plaza, Loreto
· Seri leatherback ceremony begins (4 days)
· Posters go up; Main Plaza and vicinity

Wednesday, January 23
· Poster and oral sessions; Main Plaza and Municipal Auditorium
· Workshops; Locations TBA

Thursday, January 24
· Poster and oral sessions; Reception and awards ceremony sponsored by Costa Rican Ministry of Environment and Energy; Tippling Turtle Bar

Friday, January 25
· Posters, oral sessions and workshops continue
· Awards Banquet, closing remarks

Saturday, January 26
· MTSG meeting
· Post-symposium excursions (go see the gray whales!)

Associated Events
One of the highlights of the meeting will be a minisymposium on binational sea turtle conservation and research in the Californias on Tuesday the 22nd; for more information, please contact Jeffrey Seminoff (E-mail: Jeffrey.Seminoff@noaa.gov). The 28th Symposium will also serve as the venue for the 10th Annual Meeting of the Grupo Tortuguero together with the meeting of Latin American Sea Turtle Specialists (RETOMALA), to take place in the Municipal Auditorium in Loreto. The coordinators for this meeting are Omar Chassin (E-mail: chassin@oikos.unam.mx) and Chuy Lucero (E-mail: chuy@grupotortuguero.org). As usual, the MTSG annual general meeting will occur the morning after the banquet, Saturday the 26th. We also welcome all other regional meetings (contact Jeffrey Seminoff to schedule special meetings and events).

Call For Papers, Posters and Resolutions: The program committee will review all abstracts received prior to 15 September 2007. Final details are still being worked out regarding the themes and chairs for the various sessions. Nonetheless, we would like to provide you now with the information required for abstract submission. We urge all potential presenters to review the Symposium website over the coming months to determine the oral or poster sessions most appropriate for their presentation, and we also request that you consider the theme of the Symposium, as described above – Native Oceans – as you conceive your topics for presentation. Use the Symposium web site: http://iconferences.seaturtle.org/ to access guidelines and to make your submission. If you wish to submit a Resolution to be considered by the Board of Directors of the ISTS please follow the guidelines on the Symposium website.

Symposium Registration: You must register to attend the Symposium and to submit an abstract. The preferred registration method is to use the Symposium's web site http://iconferences.seaturtle.org. There you will find everything you need to know about the Symposium in addition to a user-friendly interface for registration.

Lodging and travel to the ISTS: The Organizers are currently negotiating discounted lodging and airfares, as well as a formal relationship with a travel provider that will allow for the purchase of tickets and the arrangement of pre- and post- symposium travel online. All STS travel and lodging as well as pre- and post-symposium travel will be coordinated by Journey Mexico (contact: Rebecca Scotti (rebecca@journeymexico.com). Because we are organizing such a large group of people and using every hotel, bus and taxi and plane in and to Loreto, we ask that you please coordinate your lodging and travel with Journey Mexico (contact: Rebecca Scotti (rebecca@journeymexico.com). Please keep an eye on CTURTLE, http://iconferences.seaturtle.org and future articles in the Marine Turtle Newsletter for updates on travel arrangements and tips.

Visas: Please begin the process of getting your visa and updating your passport NOW. If you envision that you may have difficulty obtaining a visa in your home nation, please seek advice from the ISTS website http://iconferences.seaturtle.org or the Symposium Organizing Committee, c/o Raquel Bernaldez (E-mail: rakelbkin@hotmail.com).

ISTS Travel Assistance: As in past years, the ISTS will provide support for a limited number of qualified presenters at the 28th Symposium from around the world. The deadline for submission of applications will be 15 September 2007. See the symposium website for more information: http://iconferences.seaturtle.org.

Conclusion. The ISTS Board of Directors, the Organizing Committee and I are all very excited about the 28th Symposium, and are working hard to assure that it will be both a wonderful experience for you, the participants, a positive event for the community of Loreto as well as advancement for the conservation of sea turtles in Baja and around the world. Check our website for regular updates http://iconferences.seaturtle.org and we will continue to provide additional information through CTURTLE and the MTN. We look forward to seeing you in Mexico next January.

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NEWS AND LEGAL BRIEFS

This section is compiled by Kelly Samek. You can submit news items at any time online at <http://www.seaturtle.org/news/>, via e-mail to news@seaturtle.org, or by regular mail to Kelly Samek, 127 E 7th Avenue, Havana, Florida 32333, USA. Many of these news items and more can be found at http://www.seaturtle.org/news/, where you can also sign up for news updates by E-mail. Note that News Items are taken directly from various media sources and do not necessarily reflect the views or opinions of the editorial members of the MTN.

GLOBAL

Volunteers pluck 7 million pounds of trash from world's waterways

Cigarettes are still the biggest trash problem on the world's beaches, according to a group that picks them up. Of the 7.7 million pieces of debris collected in 68 countries during an annual beach cleanup day last September, cigarettes and cigarette butts accounted for roughly 1.9 million, The Ocean Conservancy reported Thursday. More than 350,000 volunteers removed about 7 million pounds of debris from 34,500 miles of coastlines and waterways, and ocean, river and lake bottoms. Coming in second at about 768,000 items were food wrappers and containers, which can be extremely dangerous to wildlife. "A plastic sandwich bag floating in the ocean may look like a jellyfish, a favorite food of sea turtles," said Sonya Besteiro, the cleanup project manager. "If a sea turtle ingests a plastic bag it may feel full and stop eating, which results in starvation. Or the bag could block the animal's digestive system and cause death." Discarded fishing gear and plastic debris kill more than 1 million sea birds and more than 100,000 marine mammals and sea turtles each year, the conservancy said. The United States had the most participants in 2006, according to the report, with 182,100 people cleaning some 4.1 million pounds of trash from 10,550 miles of waterways and coastlines. Canada saw the second-best participation with about 26,550 people, followed by the Philippines where some 25,500 volunteers helped out. Source: *AP News*, 7 June 2007.

AFRICA

Divers launch Red Sea turtle conservation project

A team of diving instructors in the Egyptian Red Sea resort of Sharm El Sheikh has launched a new sea turtle conservation scheme to help protect the area's turtle population. The Red Sea Turtle Project, supported and financed by the Project AWARE Foundation, will map South Sinai turtle populations and nesting grounds in order to identify areas in need of protection against threats such as illegal fishing. The brainchild of resident instructors, Marco Giovannini, Valentina Cucchiara, Nick Poole, Lauren Irwin and Claudio di Manao, the Red Sea Turtle Project will involve all major dive centres in Sharm, diving guests and the local Bedouin fishing community. The project has already gained support from the Ras Mohammed National Park and a speciality diving course has also been launched to help divers learn more about marine turtle biology and conservation. Marco Giovannini, the training manager of Camel Dive Club who created the Sea Turtle Awareness Diver course said the project was working hard to organise meetings with local authorities and Red Sea stakeholders to promote its campaign. The new conservation group said it hoped that the protection scheme would eventually expand to cover the entire Red Sea. For more information about Red Sea Turtle Project and how to get involved see www.redseaturtles.com. Source: *Dive Magazine*, 8 June 2007.

THE AMERICAS

Longline Fisheries, Global Warming Threaten North Pacific Loggerhead Sea Turtles: Endangered Status Sought

Conservation groups filed a formal petition today to increase protections for critically imperiled loggerhead sea turtles that are found off the U.S. West Coast and are caught and killed in industrial fisheries based in California and Hawaii. The petition, filed by the Center for Biological Diversity and Turtle Island Restoration Network, seeks to have North Pacific loggerhead sea turtles listed as "endangered" under the federal Endangered Species Act and to have areas along the California coast and off Hawaii designated as "critical habitat" for the species. The primary threat to loggerhead sea turtles is pelagic longline fishing. Longline fishing vessels seeking swordfish and tuna each deploy several thousand baited hooks on fishing lines that can extend for more than 60 miles. Over a billion longline hooks are set in the world's oceans each year, catching and killing not just swordfish and tuna but thousands of sea turtles, seabirds, marine mammals and sharks. More than 1,000 scientists and 300 organizations from 100-plus countries have called upon the United Nations for a moratorium on pelagic longline fishing in the Pacific Ocean. Source: *Center for Biological Diversity press release*, 13 July 2007

Tough times for turtles: Research continues on endangered leatherback turtles

A decade ago, Mike James and Kathleen Martin set out to protect the endangered leatherback sea turtle. The couple founded the Nova Scotia Leatherback Turtle Working Group (NSLTWG) and took their quest directly to the community with a poster campaign asking, "Have you seen this turtle?" After a decade of committed work, NSLTWG has established that not only do turtles come to east coast waters, they come regularly. Their work has spawned a revolutionary model for marine conservation. Annual visits to coastal villages have earned the loyal participation of hundreds of volunteer fishermen, as well as naturalists, tour-boat operators and community members, who have learned techniques for disentangling turtles from fishing gear, the chief threat to the leatherback's survival. Now their pioneering work has earned them a prestigious award — a gold medal for conservation by the Canadian Environment Awards. Source: *Dalhousie News*, 29 June 2007.

Rescuers Return Turtle To Ocean.

A loggerhead turtle made its way back to the Pacific on Thursday with a little help from SeaWorld. The marine reptile's journey to the open sea was a long and circuitous one. It was brought to the park about a year ago by employees of the Stephen Birch Aquarium at Scripps Institute, who had gotten via an Encinitas dive shop. According to a SeaWorld news release, the turtle had been brought to the beach in that North County city by a private owner who, after having the reptile for four years, intended to release it into the ocean. People on the beach that day, however, convinced the owner to turn it over to the dive shop. SeaWorld employees cared for the animal for the past year until releasing the 36-pound, 15-inch loggerhead on Thursday morning several miles off the San Diego coast. It had weighed only 7.5 pounds when it arrived at the park, according to the news release. Officials said they believe the turtle will head south, then onto Japan. If it lives to adulthood, it could be reach 200 pounds and be 3 feet long. Source: *NBCSandiego.com*, 19 July 2007.

24 loggerhead turtles to be released

The Department of Environmental Protection's (DEP) Florida Park Service and Florida Fish and Wildlife Conservation Commission (FWC) announced the groups will release 24 loggerhead turtles at Sebastian Inlet State Park on 2 July, 2007. The 3-year-old turtles are graduates of an innovative National Marine Fisheries Service program, the Turtle Excluder Device (TED) certification program. The TED is a metal grid of bars attached to a shrimp trawling net. It has an opening at either the top or the bottom which creates a hatch allowing larger animals such as sea turtles to escape while keeping shrimp inside. In 1987, the United States implemented regulations that require all U.S. shrimpers to use TEDs on their trawlers. Source: *Florida Today,* 30 June 2007.

Climate change affecting sea turtle nesting habits

The changing nesting patterns of endangered sea turtles in Guyana, is alerting environmentalists to the impact of climate change on these marine animals. The shell beaches in Region One have hosted thousands of nesting turtles over the years, and conservationists have been endeavouring to protect the turtles from heavy domestic use and from being traded. Project Coordinator of the Guyana Marine Turtle Conservation Society Michelle Kalamandeen said recently that climate change is affecting the sea turtles. According to Kalamandeen, in the 1960s the Hawksbill (critically endangered) and the Olive-Ridley (endangered) were our main nesting turtles, now the green turtles (endangered) and the leatherbacks (critically endangered) are mostly coming to nest on Guyana's shores. The Pacific Leatherback is said to be now extinct and the Atlantic Leatherback is facing extinction. The change in the time period for nesting in Guyana may also be a significant sign. Usually sea turtles nest in Guyana from March to August every year. However, for the last three to four years, the nesting pattern has shifted from mid-January to mid-July. This may have a significant impact on the hatchlings as food availability may be an issue for them. Source: *Stabroek News*, 25 June 2007.

New Report Finds Hope Despite Over-exploitation of Endangered Caribbean Sea Turtles

TRAFFIC announced a new report (http://www.traffic.org/content/952.pdf) indicating that high levels of exploitation in legal fisheries, and through illegal take and trade, continue to pose a threat to the marine turtles of the Wider Caribbean region. The report was commissioned by the Secretariat of CITES and released at the CITES Conference of Parties in The Hague in June 2007. While documenting major advancements in marine turtle research and conservation in recent years, the report finds that legal but largely unmanaged marine turtle exploitation persists in over half of the 26 Wider Caribbean countries and territories surveyed. Despite challenges associated with inadequate restrictions on exploitation and a lack of systematic monitoring of the number of turtles killed each year, the report finds hope in the region's many pioneering initiatives. Specific recommendations in the report include: the establishment of scientifically-based limits on the exploitation of marine turtles; comprehensive surveys to quantify exploitation; monitoring and awareness programmes; a more coherent legal

framework; and better national and regional law enforcement. The assessment is the latest of a series of technical reviews associated with the CITES Caribbean Hawksbill Turtle Range State Dialogue Meetings (http://www.cites.org/eng/prog/hbt.shtml); a similar assessment of northern Caribbean countries was published by TRAFFIC in 2001 (http://www.traffic.org/seaturtles/). For more information, contact Dr. Karen Eckert, WIDECAST/Duke University, keckert@widecast.org.

ASIA

Tax electricity to save sea turtles

Members of the public should be charged a tax of US$1 (Bt33) on monthly electricity bills to help save marine turtles in Asia, according to research from the Economy and Environment Programme for Southeast Asia. Prof Orapan Nabang-chang-Srisawalak of the research team said the idea was initiated by focus group discussions in China, the Philippines, Vietnam, and Thailand between 2005 and this year. After surveying 3,680 respondents across the region, the study shows that people are willing to pay only $0.02 to save marine turtles, even though they believe conservation is important. In addition, they believe they are already too highly taxed and do not believe that the taxes will be effectively collected or used. The study suggested that if people could pay $1 per household per month, it would raise between $50 million and $135 million per year in the four countries and would be enough to create sustainable activities to save the sea turtle in the region. The amount is more than the current combined global expenditure on marine turtle conservation by 162 conservation organisations, estimated at some $US20 million per year. Source: *The Nation* (Thailand), 24 July 2007.

Small steps key to saving giant turtles

Small and inexpensive steps could go a long way towards rescuing the Western Pacific's dwindling population of giant sea turtles. At a turtle crisis conference in Malaysia, conservation biologist Peter Dutton urged authorities to do more to preserve the state of leatherback turtles' nesting beaches to ensure eggs are hatched. "The population recovers very rapidly in the period of 25 to 30 years," Dutton said in an interview from Malaysia's eastern Terengganu state, where NOAA is holding a four-day conference to develop a long-term conservation plan for leatherbacks in the region. Leatherbacks were once a star attraction in Terengganu, where they frequently nested. None have been sighted in the last few years and overfishing, poaching and pollution have been blamed for killing them. Dutton said some of the biggest threats could be easily avoided, for example by blocking the use of fishing nets at nesting areas because they could strangle females coming ashore to nest and prevent baby turtles from safely leaving. He said the focus was now on protecting female turtles and nesting beaches in Indonesia's Papua, the Solomon Islands, Vanuatu and Malaysia. Particularly in Indonesia's Papua "the leatherback population has not collapsed," which leaves time for conservation efforts, he said. Source: *Agence France Presse*, 20 July 2007.

Juvenile green turtles set free in Sai Kung

Dozens of juvenile green turtles, incubated locally and under the care of the Agriculture, Fisheries and Conservation Department and Ocean Park over the past seven months, have been returned to the sea. Department staff set 61 turtles free on Tai Long Wan beach (Hong Kong) in batches in a week-long operation that started July 11 and finished at noon July 17. The turtles will spend their first few years in the seaweed mats in open waters. Wetland & Fauna Conservation Officer (Monitoring) Mr Cheung Ka-shing said the release of the turtles took into account suitable water temperature and favourable water current. The department microchipped the turtles for future identification and took blood samples from them for scientific research purposes. Since being hatched last December, the turtles had grown remarkably. In a matter of seven months, they increased on average from 25 grammes to 800 grammes in weight and from 5cm to 16cm in carapace length. The juveniles' story dated back to last September when their mother was found nesting on Tai Long Wan. Because of the cooling weather and the risk of outside disturbance, the department collected the eggs for both artificial and natural incubation and eventually obtained 61 hatchlings. Tai Long Wan had not been nested by sea turtles for more than 30 years. The department will continue to monitor the area and its vicinity for any new nesting incidents. Source: *PressZoom*, 17 July 2007.

Greenpeace raises serious concern over mega port in Orissa

International environmental campaigner Greenpeace has raised serious concern over steel major Tata Steel's move to set up a mega port in Dhamra in Orissa's coastal Bhardrak district, saying it would be an 'ecological blunder causing irreversible destruction' in the state's coastal areas. The Dhamra port site is situated just five kilometres from the Bhitarkanika National Park, India's second largest mangrove forest and less than 15 kilometres from the Gahimatha Marine Sanctuary, the world's largest mass nesting ground for the endangered Olive Ridley sea turtles. Tata Steel and construction giant Larsen and amp; Toubro are jointly promoting Dhamra port with an estimated cost of Rs.25 billion. Addressing a news conference here Friday, Oceans Campaigner of Greenpeace Ashish Fernandes said: 'A Greenpeace-commissioned study has unequivocally established that Tata Steel's port at Dhamra would be an ecological blunder causing irreversible destruction.' Releasing the report on the World Oceans Day, renowned turtle researcher S.K. Dutta said: 'The finding shatters the theory that the offshore waters near Dhamra are a no-turtle zone. The water and the beach around the port site are breeding and feeding grounds for the turtles.' 'Over the course of our study conducted between February and March this year, we have recorded over 2,000 dead turtles, victims of mechanised fishing on the port site and in the nearby areas like Kanika Sands, an island off the port site,' said Dutta, principal investigator of the study. Source: *India eNews*, 8 June 2007.

Malaysia to release thousands of hawksbill turtles

About 30,000 hawksbill turtles are expected to be released into the sea this year from a conservation programme that collected eggs along the coast of Malacca state, a report said Thursday. "Last year, a total of 24,800 turtles were set free and this year we expect to free about 30,000," said Sukarno Wagiman, head of resources rehabilitation at the Fisheries Department.About 40 percent of the eggs were found on Upeh Island, off the Malacca coast. The state government is taking back the island -- which was sold to national utility company Tenaga Nasional in 2003 -- to turn it into a research and management centre for the turtles. "The government wants to protect the island to help preserve the hawksbill turtles," Malacca chief minister Mohamad Ali Rustam said. Source: *Agence France Presse*, 4 July 2007.

EUROPE

Climate change causes early arrival of loggerheads to Alanya

Turkey's endangered loggerheads were already the subject of much attention both as a tourist attraction and a part of the country's natural wealth, now however, they are in the news for a different reason after their arrival on Turkey's southern sandy shores a month early; yet another result of global warming, experts say. Loggerheads usually come on land around July every year, but this year began to arrive in June. The sight of turtles coming back to Alanya, their place of birth, after traveling miles and miles, spurred the authorities to act. While the Alanya Agricultural Directorate takes precautionary measures on the beaches, the Alanya Environment preservation and Blue Flag Association will protect eggs of the loggerhead, a species on the edge of extinction. Authorities are sending warning that fire, dogs and cats are banned in this area and calling the citizens to be aware of their beaches' endangered visitors. Head of the Alanya Agricultural Directorate Umut Olgun said that the turtles have started arriving earlier on the shores of Alanya this year. Remarking that loggerheads typically arrive on Alanya shores to lay their eggs between July and September every year, Olgun pointed out that their early arrival this year could have been caused by global climate change. Source: *Today's Zaman*, 24 June 2007.

Turtles loyal in feeding and breeding

British scientists have discovered sea turtles, after laying their eggs, travel hundreds of miles to return to traditional foraging sites. The research, led by Annette Broderick at the University of Exeter, strengthens the argument for the protection of key foraging sites of the endangered species. The extent to which turtles showed fidelity to specific foraging sites and routes was a surprise, said Broderick. Marine turtles migrate hundreds of miles between breeding and foraging grounds, so it is amazing they are able to return to exactly the same sites via very similar routes. Broderick and her team tracked 20 turtles nesting at two Cyprus beaches. All females remained in the same foraging grounds, moving to deeper water for the winter. Five females were also tracked when they nested again up to five years later and returned to the same foraging sites. Scientists said they don't know why this behavior has evolved but added they believe it's possible sea turtles are territorial or are responding to limited food resources by sticking to their own feeding patches. Source: *UPI*, 30 April 2007.

Rare leatherback turtle washes up dead in Co Cork

rare leatherback turtle has washed up dead along the shoreline in Ballycotton, Co Cork. The reptile, which is said to be between 10 and 12 feet long, was spotted this morning. Marine officials are investigating and tests will be carried out to determine the cause of its death. Leatherbacks are the largest turtles in the world and normally spend their time in warm tropical waters. The sometimes come close to Ireland to feed on jellyfish. The turtles swim thousands of miles every year from their feeding grounds to beaches where they lay their eggs. Source: *Belfast Telegraph*, 24 July 2007.

OCEANIA

Rare turtle death not in vain

A rare sea turtle with only one recorded sample at the Queensland Museum will be examined by UQ marine scientists and veterinarians. The Olive Ridley Turtle, the smallest of the sea turtles measuring about 60 centimetres long, was found washed up by a fisherman on Main Beach at North Stradbroke Island. UQ Moreton Bay Research Station Education Officer Dr Kathy Townsend said attempts were made to save the turtle but it was too sick. She said Moreton Bay was the southern extent of their distribution and Olive Ridleys had only been recorded once or twice in the past decade. A necropsy of the turtle indicated that it had been ill for some time and was mostly likely pushed by ocean currents to the island. The skeleton will be sent to the Queensland Museum which currently lacks a complete Olive Ridley skeleton. Source: *UQ News Online*, 30 April 2007.

Turtles need to be watched

Environmental stakeholders are calling for a better monitoring system to be put in place to protect turtles. Researcher at the University of the South Pacific Merewalesi Laveti said according to the response from awareness programs, fewer turtles were nesting and more were being spotted in nearby waters. "To researchers, this is an indication that more turtles nearing nesting stages are being harvested and those not in the nesting stages are the ones that people can see," Ms Laveti said. "If there is a proper monitoring system put in place people will communicate with the proper authorities on anything to do with turtles." Ms Laveti said such information helped researchers in their work on the endangered species. People living along coastal areas have been constantly reminded not to kill turtles unnecessarily especially for traditional events. Another project which is being observed in Fiji and other parts of the region, she said is the Turtle Moratorium. The project focuses on protecting turtles also the usage of its shells being made into jewelleries and similar creativity. Turtle Moratorium was launched in 2004. Environmentalists have also said that there were many threats to sea turtle populations in the Pacific region, but direct and indirect impact by humans for example harvest of turtles and eggs and by catch in fisheries, were among the most serious problems. Source: *Fiji Times*, 16 June 2007.

Rare Moreton Bay turtles threatened

Lost crab pots are killing endangered Loggerhead turtles in Moreton Bay, igniting fears they could become extinct. Sea World and the Australian Marine Conservation Society (AMCS) yesterday launched an extensive campaign to warn fishermen of the devastating environmental impact lost and discarded crab pots were having in the area.In the past 10 years, the Loggerhead turtle population in Moreton Bay has dropped by up to 80 per cent - and Sea World Marine Sciences Director Trevor Long said they could be gone altogether within 100 years. Mr Long said unsuspecting turtles were climbing into crab pots or becoming entangled in other recreational and commercial fishing gear - and subsequently drowning. The first step in tackling the problem was ensuring fishermen were more responsible with their pots. "A lot of times these crab pots have been lost or discarded (and) they've floated away from where the fisherman had put them," Mr Long said. AMCS will use kayakers and volunteers to map the location of crab pot "hot spots" and attempt to remove discarded pots - in turn educating people about the dangers posed by errant pots. Other human activities affecting turtle populations include discarded plastic bags, while boat strikes were believed to kill one or more turtles every day in Queensland waters. Source: *Brisbane Times*, 16 June 2007.

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This section is compiled by the Archie Carr Center for Sea Turtle Research (ACCSTR), University of Florida. The ACCSTR maintains the Sea Turtle On-line Bibliography: (http://accstr.ufl.edu/biblio.html).

It is requested that a copy of all publications (including technical reports and non-refereed journal articles) be sent to both:

1) The ACCSTR for inclusion in both the on-line bibliography and the MTN. Address: Archie Carr Center for Sea Turtle Research, University of Florida, PO Box 118525, Gainesville, FL 32611, USA.

2) The editors of the Marine Turtle Newsletter to facilitate the transmission of information to colleagues submitting articles who may not have access to on-line literature reviewing services.

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ACKNOWLEDGEMENTS

Publication of this issue was made possible by donations from the following individuals: Robson Santos, Arthur Kopelman, Bob Pitman, Daniela Hetzel, Karger Libri, David Fein , John A Musick, Debbie Fritz-Quincy, Hobe Sound Nature Center, Rosalie Ohlson, John Frazier, Kennard Watson, Katherine Mansfield, South Carolina Department of Natural Resources, Frank J Schwartz, Nicholas Mrosovsky **and organisations:** Cayman Turtle Farm, Ltd., Conservation International, International Sea Turtle Society, IUCN - Marine Turtle Specialist Group, Sea World, Inc., Sirtrack Ltd., US National Marine Fisheries Service-Office of Protected Resources, Western Pacific regional Fishery Management Council, WWF International.

The MTN-Online is produced and managed by Michael Coyne.

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